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Investigating the Relationship Between Childhood Trauma, Dissociation and Psychotic Symptoms in First Episode Psychosis

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Abstract

It is increasingly accepted that there is an association between childhood trauma, dissociation and psychosis. Furthermore, significant rates of dissociative disorders and clinical levels of dissociative symptoms have been found in those with chronic schizophrenia. However, studies focusing on the impact of dissociative experiences in early psychosis are relatively lacking.

The overarching aim of this thesis was to contribute to the paucity of research that has examined the relationship between childhood trauma, dissociation and psychotic symptoms, as well as the prevalence of co-occurring dissociative symptomatology in those with early psychosis. More specifically, we sought to investigate the mediating effect of dissociation on the relationship between childhood trauma and positive psychotic symptoms (i.e., hallucinations and delusions). Whether hallucinations and delusions were associated with different types of dissociation proposed in the bipartite model (i.e., compartmentalization and detachment) was also examined. The thesis also endeavored to employ a clinician-administered measure and an alternative to the ubiquitous Dissociative Experiences Scale (DES) to quantify dissociative experiences in our study.

Sixty-six young people with first episode psychosis (FEP) completed a research interview that included the Structured Clinical Interview for DSM-IV Axis I & Axis II Disorders, Childhood Trauma Questionnaire (CTQ), the Structured Clinical Interview for DSM-IV Dissociative Disorders-Revised (SCID-D-R), the Positive and Negative Syndrome Scale (PANSS), the DES-II and a demographics questionnaire.

We found that 13.6% of our sample met diagnostic criteria for a lifetime dissociative disorder. Approximately 36% of the FEP sample had experienced dissociative symptoms at moderate to severe levels based on SCID-D-R ratings. Furthermore, clinical levels of

dissociative symptoms occurred more frequently in those with a history of childhood trauma compared to those without.

When employing the SCID-D-R, childhood trauma positively correlated with dissociation. Furthermore, dissociation mediated the relationship between childhood trauma and delusions. Contrary to previous findings, we found no relationship between dissociation and hallucinations and no mediating effect of dissociation on the association between childhood trauma and hallucinations. However, we found significant discrepancies in results depending on whether the SCID-D-R or the DES-II was used to quantify dissociation.

Additional analyses were also conducted to examine the relationship between different types of dissociative experiences and hallucinations, delusions. We found that only the correlation between compartmentalization type dissociation and delusions remained significant after Bonferroni-corrections were made to the alpha level. However, hallucinations were not correlated with either compartmentalization or detachment as indexed in our study.

The significant discrepancies in results when two different but both well-validated measures of dissociation were used to test the relationship between psychotic symptoms and dissociation highlights the need for future research to carefully consider how dissociative experiences are measured.

Overall, the high prevalence of clinical dissociative symptoms and the significant associations between dissociation and psychotic symptoms in our sample suggests that dissociation is a relevant consideration for those experiencing FEP. Our findings suggest that dissociative symptoms should be routinely assessed for in early psychosis intervention settings, especially in cases where childhood trauma is disclosed or suspected. Dissociative experiences should also be incorporated into case formulation and treatment planning where appropriate. A failure to consider these experiences may mean a subgroup of those with early psychosis will continue to have unmet mental health needs.

General Declaration and Publications During Enrolment

I hereby declare that this thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.
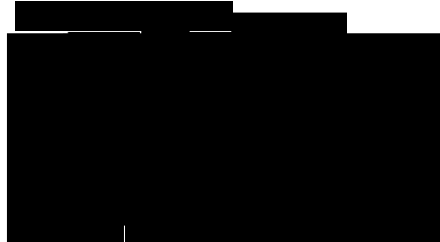
This thesis includes 1 original paper published in a peer reviewed journal and 1 manuscript currently in press. The core theme of the thesis is understanding the relationship between childhood trauma, dissociation and psychosis. The ideas, development and writing up of all the papers in the thesis were the principal responsibility of myself, the student, working within the School of Psychological Sciences under the supervision of Dr Katherine Lawrence, Dr Katrina Simpson, Dr Sarah Bendall (external supervision) and Associate Professor Mario Alvarez-Jimenez (external supervision).

The inclusion of co-authors reflects the fact that the work came from active collaboration between researchers and acknowledges input into team-based research.

In the case of Chapters 7 and 8 my contribution to the work involved the following:
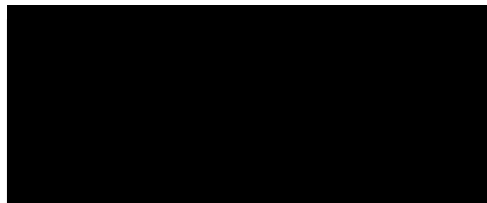
Thesis Chapter	Publication Title	Status	Nature and extent of candidate contribution	Co-author, nature and % contribution	Co-author Monash student (Y/N)
7	Investigating the prevalence of dissociative disorders and severe dissociative symptoms in first episode psychosis	In Press	- Scoped the aims and direction of the manuscript - Data collection and analysis - Wrote manuscript and incorporated feedback from supervisors 75%	Dr Katherine Lawrence, provided feedback on manuscript 5%	No
				Dr Katrina Simpson, feedback on manuscript 2.5%	No
				Dr Sarah Bendall, guidance in the conceptualization of the paper, provided feedback on the manuscript 10%	No
				A/Prof Mario Alvarez-Jimenez, feedback on manuscript 5%	No
				Dr Natalie Peach, assistance with data collection 2.5%	No
8	Does dissociation mediate the relationship between childhood trauma and hallucinations, delusions in first episode psychosis?	Published	- Scoped the aims and direction of the manuscript - Data collection and analysis - Wrote manuscript and incorporated feedback from supervisors 75%	Dr Katherine Lawrence, assistance in conceptualizing and designing study, feedback on drafts 5%	No
				Dr Katrina Simpson, guidance with data analysis provided feedback on manuscript 2.5%	No
				Dr Sarah Bendall, guidance in the theoretical framing of the paper, provided feedback on the manuscript 10%	No
				A/Prof Mario Alvarez-Jimenez, provided feedback on manuscript 5%	No
				Dr Natalie Peach, assisted with data collection 2.5%	No

I have renumbered sections of submitted or published papers in order to generate a
consistent presentation within the thesis.

Student signature: **Date:** 23/11/2018

The undersigned hereby certify that the above declaration correctly reflects the nature and
extent of the student's and co-authors' contributions to this work. In instances where I am not
the responsible author I have consulted with the responsible author to agree on the respective
contributions of the authors.

Main Supervisor signature: **Date:** 23/11/2018

Acknowledgments

Over a 1000 hours of clinical placement, two years of participant recruitment and interviews, a year of maternity leave, relentless hours of write-up, and now it's finally over. Some days the idea of writing these acknowledgements seemed so remote and I wondered if I would ever get to this stage. But now we are here, and there are many people who deserve my sincerest gratitude.

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To my son Hugo, sometimes on the challenging days the thought of you was enough to keep me going, even if it was just to teach you to never give up on your goals and dreams.

Chapter 1. Introduction

1.1 Overview of Research

Psychotic disorders are amongst the costliest in terms of societal expenditure and more importantly human suffering (van Os, & Kapur, 2009). Therefore, considerable effort has been made to identify and understand the risk factors associated with the etiology of psychotic disorders. In the last few decades social and psychological factors have been implicated in the development of psychosis. It is now well-recognized that experiences of childhood trauma are a key risk factor for psychotic disorders in general, and the major symptoms of psychosis (i.e., hallucinations and delusions) more specifically (e.g., Bailey et al., 2018; Varese, Smeets et al., 2012).

In recent years, research interest has been directed to investigating the mechanisms underlying the relationship between childhood trauma and psychotic disorders and symptoms (e.g., Bentall et al., 2014; Gracie et al., 2007; Hardy, 2017; Read, van Os, Morrison, & Ross, 2005; Williams, Bucci, Berry & Varese, 2018). One proposed mechanism is dissociation. A longstanding notion is that the functional purpose of dissociation is to reduce the awareness and experience of intolerable distress which arises as the result of traumatic events (Briere, 2006). This potentially protective reaction can then become an ingrained, overgeneralized and problematic response to ongoing stressors in everyday life (Terr, 1991). There is some empirical support for the trauma model of dissociation (e.g., Dalenberg et al., 2012; Ogawa et al., 1997).

The evidence increasingly suggests that dissociative experiences have an important impact on the relationship between childhood trauma and psychosis (e.g., Moskowitz, 2011; Ross, 2004; 2007). Those with psychosis and a history of childhood trauma frequently report

more symptoms of dissociation that those with no trauma (e.g., Greenfield, Strakowski, Tohen, Batson, & Kolbrener, 1994; Perona-Garcelán et al., 2010; Schroeder, Langeland, Fisher, Huber & Schäfer, 2016). Furthermore, in those with psychosis, a substantial number of studies have reported significant associations between dissociation and positive psychotic symptoms in general, and hallucinations, delusions more specifically (e.g., Lysaker & LaRocco, 2008; Perona-Garcelán, Carrascoso-López et al., 2012; Schäfer et al., 2012; Schroeder, et al., 2016).

More recently, whether dissociative mechanisms underlie the relationship between childhood trauma and hallucinations as well as childhood trauma and delusions has also been investigated. Several cross-sectional studies have found that dissociation mediates the relationship between childhood trauma and hallucinations in those with established psychosis and in non-clinical samples (e.g., Cole Newman-Taylor & Kennedy, 2016; Perona-Garcelán, Carrascoso-López et al., 2012; Varese, Barkus et al., 2012). Although findings for the mediational role of dissociation on the association between childhood trauma and delusions are more mixed, with studies indicating both significant mediational effects (e.g., Cole et al., 2016) and no significant mediational effects (e.g., Perona-Garcelán, Carrascoso-López et al., 2012).

At present, there are several gaps in the extant research that need further clarification to more confidently establish whether dissociation mediates the relationship between childhood trauma and hallucinations and/or childhood trauma and delusions. Firstly, there is a scarcity of studies in this area that have utilized a group with early psychosis. The issues with this oversight are further described in Section 1.1 of this chapter. Secondly, the vast majority of studies in the area have employed an iteration of the Dissociative Experiences Scale (DES) to quantify dissociative phenomena. There is a relative paucity of studies using an alternative measure of dissociation, especially one that is not self-report. There are some methodological concerns with the use of the DES in those with psychotic disorders and these are discussed in Section 1.2. Thirdly, given the inconsistencies in existing findings regarding the effect of

dissociation on the relationship between childhood trauma and delusions, further research is needed to clarify the role of dissociative mechanisms on delusional ideation. In short, it is important to elucidate the role of dissociation on the relationship between childhood trauma and the positive symptoms of psychosis as such findings will have significant theoretical and clinical implications. These findings will likely affect our current understanding of the nature of dissociative and psychotic symptomatology, the classification of dissociative and psychotic disorders and treatment recommendations for those with psychosis and a history of trauma.

In terms of defining dissociation, there has been a shift in our conceptualization of dissociation from a unidimensional construct on a single continuum of severity to a bipartite model (Brown, 2006; Holmes et al., 2005; Spitzer, Barnow, Freyberger & Grabe, 2006; Vogel et al., 2013). Disparate dissociative mechanisms might also underlie the relationship between childhood trauma and hallucinations compared to childhood trauma and delusions. The bipartite model, suggests that dissociation consists of two qualitatively distinct categories of dissociative experiences labeled detachment and compartmentalization (Brown 2006; Holmes et al., 2005). Detachment consists of symptoms that reflect alterations of consciousness, leading to feelings of unreality and a profound sense of disconnection (or detachment) in domains such as the self (depersonalization), body (out-of-body experiences), external world (derealization) and emotional experiences (emotional numbing) (Brown 2006; Holmes et al., 2005). Symptoms of compartmentalization are characterized by an underlying deficit in the "ability to deliberately control processes or actions that would normally be amenable to such control" (Holmes et al., 2005, p. 7). These deficits cannot be overcome via acts of will, but are reversible in principle and compartmentalized functions continue to operate 'normally' and influence thoughts, feelings and behavior (Brown, 2006; Holmes et al., 2005). It may be that hallucinations and delusions are differentially related to compartmentalization and detachment type dissociation.

To date, there has been limited empirical investigation of how hallucinations and delusions relate to these proposed types of dissociation. It has been suggested that hallucinations may be the product of a form of dissociated identity, where inner thoughts and speech that are experienced as split-off and/or unrecognized components of the individual's personality intrude into conscious awareness (Longden et al., 2012; Moskowitz & Corstens, 2007; Moskowitz, Read, Farrelly, Rudegair & Williams, 2009). Although other researchers suggest that experiences of detachment and a disconnection from one's own self may lead to biases in reality discrimination and subsequent hallucinatory experiences (e.g., Perona-Garcelán, et al., 2008; Perona-Garcelán, 2011; Perona-Garcelán et al., 2013). In terms of delusions, Moskowitz and colleagues (2009) suggest that feelings of unreality about the body and self (i.e., detachment dissociation), may underlie delusions of control, passivity and certain bizarre delusions such as thought withdrawal or insertion. Whether there is a differential relationship between types of dissociative experiences (i.e., compartmentalization and detachment) and hallucinations and delusions is by no means established but warrants additional empirical examination. Such studies will provide a more precise understanding of the role of dissociative experiences on the positive symptoms of psychosis and hopefully lead to the development of more targeted and effective interventions.

1.2 Chronic Schizophrenia Versus First Episode Psychosis Samples

The majority of research in the area has either recruited participants with established schizophrenia or those from a non-clinical population. There is a scarcity of research in groups with first episode psychosis (FEP). Given the overall severity of psychotic disorders, empirical findings in chronic populations are likely affected by factors associated with the course of illness, such as long-standing psycho-pharmacological treatments, psychological distress and

ongoing social and functional impairment. The impact of these iatrogenic factors might be minimized by studying the relationship between psychotic and dissociative symptoms and disorders in the early phase of psychosis onset. One study has shown that the severity of dissociation significantly differs between groups with FEP and chronic schizophrenia (Braehler et al., 2013). Therefore, the extent of the relationship between dissociation and psychosis as well as the impact of dissociative mechanisms on the relationship between childhood trauma and psychotic symptoms may also differ between these two groups.

Similarly, there may also be discrepancies in the prevalence rates of co-occurring dissociative disorders between those with FEP and established psychosis. In those with chronic schizophrenia, several studies have found that a substantial proportion also met diagnostic criteria for a dissociative disorder (Haugen & Castillo, 1999; Moise & Leichner, 1996; Ross & Keyes, 2004; Steinberg, Cicchetti, Buchanan, Rakfeldt & Rounsaville, 1994; Yu et al., 2010). Studies have also shown that a significant subgroup of those with schizophrenia also experience dissociative symptoms at clinically significant levels (e.g., Haugen & Castillo, 1999; Steinberg et al., 1994). It has been argued that there is significant co-occurrence between dissociative and psychotic disorders (e.g., Ross, 2006). However, at the time of writing no studies have examined the prevalence of dissociative disorders and clinically significant dissociative symptoms in a FEP cohort. Additionally, no study has examined whether dissociation mediates the relationship between childhood trauma and hallucinations, delusions or whether delusions and hallucinations are related to distinct types of dissociation (i.e., compartmentalization and detachment) in an early psychosis sample.

1.3 Issues with the Measurement of Dissociation

The predominant use of the DES to measure dissociative experiences presents as a

potential measurement issue for research in this area (Renard et al., 2017). Several researchers have expressed concerns regarding the use of the DES to capture experiences of dissociation in groups with psychosis. The relationship between dissociation and the positive psychotic symptoms, especially hallucinations, may be conflated by overlapping item content (Perona-Garcelán, Carrascoso-López et al., 2012; Schäfer, Aderhold, Freyberger & Spitzer, 2008; Schäfer et al., 2012). A number of researchers have also suggested that people with psychosis may have difficulties in comprehending the content of some items on self-report measures of dissociation including the DES (e.g., Perona-Garcelán, et al., 2011; Schäfer, et al., 2008). Given the complex psychological constructs under consideration, the use of a clinician-rated instrument to supplement self-report may be a beneficial method of quantifying experiences of dissociation. Furthermore, it may be useful to replicate and validate findings from the extant research using measures other than the DES and in forms other than self-report (i.e., clinician-administered measures).

1.4 Clinical Issues

In addition to clarifying our understanding of the relationship between dissociation and psychosis in a FEP group, the current thesis potentially has significant implications for clinical practice. Firstly, the prevalence of dissociative disorders and clinically elevated symptoms of dissociation in early psychosis is not known. Therefore, there is likely of subgroup of those with FEP who have unmet mental health needs. Secondly, investigating whether the relationship between childhood trauma and hallucinations, delusions is mediated by dissociation and whether hallucinations and delusions are associated with different types of dissociation (i.e., compartmentalization and detachment) will provide a clearer, more nuanced understanding of the associations between childhood trauma, dissociation, hallucinations and

delusions in early psychosis. These findings will have implications for the assessment and management of dissociative symptoms in early psychosis intervention settings. Furthermore, improved understanding of the relationship between these symptom domains will likely lead to more informed and detailed treatment formulations as well as the development of more effective treatment protocols. This will hopefully assist in preventing or reducing the impact of further psychotic episodes in those with early psychosis.

1.5 Chapter Outline

The overarching aim of this thesis was to contribute to the relatively sparse amount of research that has examined the relationship between experiences of childhood trauma, dissociation and psychotic symptoms, as well as the prevalence of dissociative disorders and symptoms in a FEP cohort. More specifically, we sought to investigate the effect of dissociation on the relationship between childhood trauma and positive psychotic symptoms (i.e., hallucinations and delusions), and whether hallucinations and delusions were associated with different types of dissociative experiences proposed in the bipartite model. Furthermore, in addressing the overarching aim, we also endeavored to rectify a methodological gap in the research by employing a clinician-administered instrument and alternative to the DES to quantify dissociative experiences in our study.

The background to the current thesis will be presented in Chapters 2, 3 and 4 of this thesis. Chapter 2 provides an overview of the trauma and psychosis literature, presenting the evidence for trauma as a risk factor and putative causal factor for psychosis. Chapter 3 discusses the current issues surrounding the definition and conceptualization of dissociation. Furthermore, the bipartite model of dissociation, which is an increasingly adopted approach to conceptualizing dissociative experiences will also be described in Chapter 3. The current

literature examining the relationship between trauma, dissociation and psychosis will be comprehensively reviewed in Chapter 4 of this thesis. This includes (1) evidence for dissociation as a mechanism underlying the relationship between childhood trauma and psychotic symptoms, (2) theories and evidence for how hallucinations and delusion might be associated with the two types of dissociation described in the bipartite model and finally, (3) the diagnostic co-occurrence of dissociative and psychotic symptoms and disorders.

The rationale, aims and hypotheses of the current research are outlined in Chapter 5. The methodology of the thesis, including a description of the participant sample, recruitment procedures, ethical considerations as well as the psychometric properties of the measures utilized are presented in Chapter 6. Additionally, approaches to data analysis are also presented in Chapter 6.

Chapter 7, 8 and 9 represent the result chapters of the thesis. Chapter 7 and 8 are presented as manuscripts that are currently published or accepted for publication. The first manuscript, entitled 'Investigating the Prevalence of Dissociative Disorders and Severe Dissociative Symptoms in First Episode Psychosis' has been accepted for publication in *Early Intervention in Psychiatry*. This paper was the first to report the prevalence of dissociative disorders and clinically significant dissociative symptoms in a FEP cohort. It further compared the frequency of severe dissociative symptoms in those with or without a history of childhood trauma. The implications of our findings in terms of recommendations for future clinical practice were also discussed.

The second manuscript, entitled 'Does Dissociation Mediate the Relationship Between Childhood Trauma and Hallucinations, Delusions in First Episode Psychosis?' has been published in *Comprehensive Psychiatry* and forms Chapter 8 of this thesis. This paper primarily investigated whether dissociation, as measured by the Structured Clinical Interview for DSM-IV Dissociative Disorders- Revised (SCID-D-R) mediated the relationship between childhood

trauma and hallucinations, delusions. Given that the majority of existing studies have utilized the DES to quantify dissociation, we also conducted the same mediation analysis utilizing the DES-II. Major discrepancies in results were found when either the SCID-D-R or DES-II were used to capture dissociation. The implications of these disparate results for future research were also discussed in the paper.

Additional results exploring the relationship between the bipartite model and positive psychotic symptoms are presented and discussed in Chapter 9. Finally, an integrated discussion, which contextualizes the key findings and implications of the entire thesis within the framework of the literature reviewed, the main thesis aims and recommendations for clinical practice is presented in Chapter 10.

Chapter 2. Childhood Trauma and Psychosis

To better understand the impact of dissociation in the context of childhood trauma and psychosis, it is important to review the evidence regarding childhood trauma and psychosis more generally. In this chapter, research that has examined the relationship between childhood trauma and psychosis will be summarized and reviewed. Evidence for childhood trauma as an acknowledged risk factor and putative causal factor for psychosis will also be presented.

2.1 Summary of Evidence for the Relationship Between Childhood Trauma and Psychosis

A substantial amount of research has demonstrated that experiences of childhood trauma are highly prevalent in those with psychosis (Bebbington et al. 2004; Bonoldi et al., 2013; Fisher et al., 2010; Matheson, Shepherd, Pinchbeck, Laurens, & Carr, 2013; Varese, Smeets et al., 2012). In the literature, childhood trauma has typically come to represent a range of negative or adverse early life experiences, including physical, sexual, emotional abuse, physical and emotional neglect, victimization and bullying. These early adverse experiences are considered to be interpersonal trauma. There is some evidence to suggest that childhood interpersonal trauma has a greater impact on the development of psychopathological symptoms such as psychosis and dissociation compared to non-interpersonal trauma (e.g., road traffic accidents) (Kisiel et al., 2014; Mauritz, Goossens, Draijer & van Achterberg, 2013; Schroeder, Langeland, Fisher, Huber & Schäfer, 2016). In the current thesis the term childhood trauma is used to refer to experiences of interpersonal trauma occurring in early life.

Broadly-speaking, the term psychosis refers to a cluster of symptoms that manifests as a loss of contact with reality (Bentall, 2003). The hallmark symptoms of psychosis are

hallucinations and delusions. Hallucinations are considered disturbances in perception, where sensations are perceived without corresponding external stimuli. Hallucinations can occur in a number of sense modalities including for example, auditory, visual, tactile, olfactory and gustatory. Delusions, are "fixed beliefs that are not amenable to change in light of conflicting evidence and usually involve misinterpretation of experiences and perception (American Psychiatric Association (APA), 2013, p. 87). Delusions can include a variety of themes, such as persecution, referential, grandiosity. The experience of psychosis is often associated with a *Diagnostic and Statistical Manual - 5* (DSM - 5) diagnosis of schizophrenia-spectrum or other psychotic disorders (APA, 2013). The first presentation of psychotic symptoms is referred to as first episode psychosis (FEP). In the current thesis the terms psychosis and psychotic disorder/s will be used interchangeably.

In people with severe mental health issues, such as schizophrenia-spectrum disorders, the experience of childhood trauma has been associated with more severe symptomatology and poorer functioning (e.g., Davidson, Shannon, Mulholland, Campbell, 2009; Lysaker, Buck & LaRocco, 2007). Until recently, due to a dominant biological paradigm, studies investigating the risk factors and causes of psychotic disorders and symptoms have largely ignored the link between childhood trauma and psychosis (Moskowitz, 2011; Read, van Os, Morrison & Ross, 2005; Ross, 2007).

However, early studies found that people with schizophrenia retrospectively report higher rates of childhood sexual abuse and childhood physical abuse compared with the general population (Greenfield, et al., 1994; Ross, Anderson & Clark, 1994). Since these preliminary findings, there has been an increase in the number of studies investigating the effect of childhood trauma on the development of psychotic symptoms and disorders. These initial findings were mixed and highly varied, with some studies reporting significant associations and others failing to find a relationship (see Read et al., 2005). Many of these early studies

suffered from methodological issues such as small sample sizes (i.e., reduced power in detecting an effect), a failure to address potential confounding variables, and the absence of appropriately-matched control group/s. In studies examining the association between trauma and psychosis, utilizing an adequately matched, non-clinical control group is necessary to establish that childhood trauma is indeed more prevalent in those with psychosis compared with the general population. In a systematic review of the early literature, only six of the 46 studies sampled were deemed to have an adequate control condition (Bendall, Jackson, Hulbert, McGorry, 2008). These methodological issues limit the conclusions that can confidently be drawn from initial research in the area.

Over the recent decade several studies have attempted to address these early inadequacies in methodological design by using larger sample sizes and more sophisticated approaches (e.g., Bentall, Wickham, Shevlin, & Varese, 2012; Heins et al., 2011; Shevlin, Houston, Dorahy & Adamson, 2008; Spauwen, Krabbendam, Lieb, Wittchen & van Os, 2006, Varese, Smeets, 2012). Population-based studies have utilized prospective designs (Arseneault, Cannon, Fisher, Polanczyk, Moffitt & Caspi, 2011; Spataro, Mullen, Burgess, Wells & Moss, 2004; Janssen et al., 2004; Lataster, Myin-Germeys, Lieb, Wittchen & van Os, 2012), longitudinal designs (Arsenault et al., 2011; Lataster et al., 2012 Spauwen et al., 2006) and explicitly controlled for potential confounding variables such as socio-demographic factors: age, gender, ethnicity and marital status (Bentall, et al., 2012; Cutajar et al., 2010; Janssen et al., 2004; Lataster et al., 2012; Lataster et al., 2006; Scott, Chant, Andrews, Martin, & McGrath, 2007; Shevlin, Dorahy, & Adamson, 2007a; Shevlin, Dorahy, & Adamson, 2007b; Shevlin, Dorahy, & Adamson, 2008; Spauwen et al., 2006; Whitfield, Dube, Felitti & Anda, 2005), socioeconomic status and income (Arseneault et al., 2011; Bentall, et al., 2012; Lataster et al., 2006; Spauwen et al., 2006; Shevlin et al., 2007a; 2007b), urbanicity (Janssen et al. 2004; Lataster et al., 2012 Spauwen et al. 2006; Shevlin et al, 2007a; 2008), and education (Whitfield

et al., 2005).

These studies have also controlled for potentially confounding psychological variables such as IQ (Arseneault et al., 2011; Bentall, et al., 2012), substance and/or alcohol misuse or dependence (Janssen et al., 2004; Lataster et al., 2012; Scott et al., 2007; Spauwen et al., 2006), level of depression (Bebbington et al., 2004; Shevlin et al, 2007a; 2007b; 2008), history of other mental health conditions (Janssen et al., 2004; Spauwen et al., 2006) and past diagnosis of schizophrenia (Scott et al., 2007).

A significant relationship between childhood trauma and psychosis was found in all but one of these more sophisticated, population-based studies (Spataro, et al., 2004). Spataro and colleagues (2004) acknowledged that their study contained numerous systematic errors in methodology that likely biased the results. For instance, the control group was not screened for the absence of childhood sexual abuse and therefore may have been included in the no childhood sexual abuse group. Additionally, a substantial number of childhood records could not be matched to the corresponding participant in the childhood sexual abuse group, leading to potentially biased sampling.

 Findings from these population-based studies indicated that when compared with non-abused controls, those with an abuse history were more likely to develop psychosis (e.g., Arseneault et al., 2011; Cutajar et al., 2010; Janssen et al., 2004; Lataster et al., 2012; Spauwen et al., 2006). Compared with participants without a history of childhood trauma, those who had experienced trauma were also more likely to report hallucinations (Whitfield et al., 2005). The majority of the cross-sectional, population studies also suggest a 'dose-dependent' relationship between the amount of trauma experienced and the development of psychosis (Bentall, et al., 2012; Lataster et al., 2006; Shevlin et al., 2007b; Shevlin et al., 2008). This is also the case for specific psychotic symptoms such as hallucinatory experiences (Shevlin et al., 2007a; Whitfield et al., 2005), and delusions (Scott et al., 2007).

Results from longitudinal studies showed that retrospective reports of trauma at baseline were associated with future development of psychotic symptoms in a two-year follow up period (e.g., Janssen et al., 2004). A dose-response relationship between trauma and the development of psychosis has also been found longitudinally (Arseneault et al., 2011; Janssen et al., 2004; Spauwen, 2006). This suggests that the greater the severity of abuse, the higher the likelihood of developing psychosis in future follow-ups.

Perhaps the most compelling evidence to date for an association between childhood trauma and psychosis has been the publication of two high-quality, meta-analytic studies (Matheson et al., 2013; Varese, Smeets et al., 2012). Varese and colleagues (2012) synthesized quantitative data from 18 case-control studies (2048 participants with psychosis and 1856 non-psychiatric controls) (Varese, Smeets et al., 2012). These case-controlled studies either compared the prevalence of childhood trauma between participants with psychosis and controls using dichotomous or continuous measures, or compared the prevalence of psychotic symptoms between participants exposed to trauma and those not exposed to trauma on dichotomous and continuous measures of psychosis and adversity. Ten prospective and quasi-prospective cohort studies (41,803 participants) as well as 8 large-scale, population-based cross-sectional studies (35,546 participants) that examined the relationship between childhood adversity and psychotic symptoms and disorders were also analyzed (Varese, Smeets et al. 2012).

Significant associations between childhood trauma and psychosis were reported across all study designs and an overall effect [odds ratio (OR) = 2.78] was found. The overall effect suggests that the odds of developing psychosis among people with childhood trauma was 2.78 times higher than among people without childhood trauma. In addition, an integrated analysis of the case-control studies suggested that people with psychosis were 2.72 times more likely to have experienced childhood trauma than non-psychiatric controls. Any experience of

childhood trauma, regardless of type (e.g., sexual abuse, physical abuse, emotional abuse, bullying, neglect, parental death) increased the risk of psychosis. The authors noted that if causality was assumed, and the pattern of other risk factors remained stable, there would be a 33% reduction in the number of people with psychosis if childhood adversity was removed from the population. The overall result from this meta-analysis found that childhood trauma was strongly associated with an increased risk of psychosis (Varese, Smeets, et al. 2012).

Matheson and colleagues (2013) conducted a meta-analytic study to assess the specificity of the relationship between childhood trauma and schizophrenia when compared to other psychiatric conditions and non-psychiatric controls. They identified 25 studies which included cohort, case-control and cross-sectional studies that met their criteria for inclusion. The ORs for childhood trauma and schizophrenia were compared to ORs for non-psychiatric controls, and those with anxiety disorders, depressive disorders, posttraumatic stress disorder (PTSD), dissociative disorders, personality disorders, affective psychosis and other psychotic disorders. Rates of childhood trauma were significantly increased in those with schizophrenia compared with non-psychiatric controls (OR = 3.60, $p < .00001$, 95% CI = 2.08-6.23) and those with anxiety disorders (OR = 2.54, $p < .007$, 95%CI = 1.29-5.01). However, the rates of childhood trauma were decreased in those with schizophrenia when compared with PTSD and dissociative disorders (OR = .03, $p < .0001$, 95% CI = 0.01-0.15). The odds of developing depressive disorders, affective psychosis and other psychotic disorders, personality disorders following childhood trauma were not significantly different from those of schizophrenia.

Since the publication of these well-conducted, meta-analyses (Matheson et al., 2013; Varese, Smeets et al., 2012), numerous small and large-scale studies continue to provide support for the association between childhood trauma and psychosis (e.g., Álvarez et al., 2015; Trauelsen et al., 2015). Additionally, a systematic review and subsequent meta-analysis of 29 studies (4680 participants) found support for a significant association between childhood

trauma and the severity of specific symptoms of psychosis in particular, hallucinations ($r =$ .199) and delusions ($r = .172$) (Bailey et al., 2018). The same meta-analysis found aside from childhood neglect, which was significantly correlated with the severity of negative symptoms ($r = .142$), negative symptoms were not associated with any other forms of childhood trauma (Bailey et al., 2018).

Overall, there is robust evidence to suggest that childhood trauma is a significant risk factor for the development of psychosis and especially positive symptoms (i.e., hallucinations and delusions). However, there are inherent methodological barriers in this field of research that makes the determination of causality difficult (Bendall et al. 2008; Morgan & Fisher, 2007). Due to the nature of the constructs of interest, the research design of studies investigating childhood trauma and psychosis are justifiably constrained by ethical considerations. These restrictions render any prospective, double-blind, randomized control trial, widely accepted as the 'gold standard' in providing evidence of causality, an ethical impossibility. Cross-sectional studies cannot test or offer evidence for causation. Additionally, the discovery of child abuse would rightly necessitate intervention, thereby altering the 'course' of the abuse as well as its associated outcomes (Bendall et al., 2008).

Although there are justifiable, ethical barriers to conducting a prospective, double-blind, randomized-control trial in this area of research, findings from other prospective research designs can still provide some evidence for a potential causal relationship. Several prospective cohort studies have been conducted to examine whether childhood trauma has a causal relationship with psychosis (Alemany et al., 2012; Bentall & Fernyhough, 2008; Husted, Ahmed, Chow, Brzustowicz, & Bassett, 2012; Schreier, et al., 2009; Selten & Cantor-Graae, 2005; van Os, Rutten, & Poulten, 2008; Wigman et al., 2011). In short, these studies have broadly found that earlier experiences of childhood trauma can predict the occurrence of psychotic experiences. However, Kelleher and colleagues (2013) asserted that these studies

suffered from several crucial shortcomings which limits them from providing robust evidence for causality. For instance, while the majority of prospective, longitudinal studies showed that childhood trauma predicted later psychotic episodes, most of them did not adequately rule out the possibility that psychotic experiences were also present prior to the trauma. Furthermore, no studies were able to demonstrate that in a sample of those with no psychotic experiences at baseline, that subsequent exposure to childhood trauma predicted new incidences of psychotic experiences. Additionally, no studies were able to show that the cessation of childhood trauma led to a reduction in incidences of psychosis. Kelleher and colleagues (2013) also noted that these prospective studies failed to adequately consider the issue of causal directionality and have largely ignored testing alternative hypotheses for the relationship. For instance, it is plausible that psychotic experiences might heighten the risk of trauma exposure or alternatively, the relationship between childhood trauma and psychosis may be bi-directional, in that both childhood trauma and psychosis are both the cause and effect for each other.

To examine potential causality, Kelleher and colleagues (2013) conducted a more methodological rigorous study and attempted to overcome the recognized issues with past research. They assessed 1,112 adolescents attending secondary school between the ages of 13 to 16. The presence/absence of auditory hallucinatory experiences, bullying and physical abuse were recorded at baseline, then again at three-month and 12-month follow up assessments. The study found that even after adjusting for psychotic experiences at baseline, bullying and physical abuse predicted psychotic experiences at the 3-month and 12-month time-points; (i.e., both trauma types predicted new incidences of psychotic experiences). They also demonstrated a dose-response relationship between the severity of bullying and later psychotic experiences (i.e., the number of types of bullying reported increased the odds of psychotic experiences at both follow-up time-points). However, the same dose-response analysis was not conducted with physical abuse as only the presence or absence and not the severity of such abuse was

recorded.

Kelleher and colleagues (2013) also found a temporal relationship between trauma and psychotic experiences. For example, the cessation of traumatic experiences corresponded with decreased odds of psychotic experiences. Furthermore, when compared to people who only experienced physical abuse at baseline but not thereafter, the experience of physical abuse at all three assessment time-points (baseline, three- and 12-month follow-up) increased the likelihood that psychotic symptoms were reported at the final 12-month follow up. A similar pattern of results was also found for bullying. A bidirectional relationship between trauma and psychosis was also found (i.e., psychotic experiences at baseline predicted physical abuse, although not bullying at the final follow-up assessment). However, following the removal of all those who experienced psychotic symptoms at baseline from the analysis, both trauma-types still predicted newly onset psychotic experience.

Kelleher and colleagues' (2013) study was able to demonstrate a clear, temporal relationship between experiences of childhood trauma and new occurrences of psychosis, by taking into account only those who were free of psychotic experiences at baseline. The relationship strength was large (i.e., high ORs), fluctuated in a dose-response pattern and the cessation of trauma corresponded with a significant decrease in the likelihood of psychosis compared to those who traumatic experiences were ongoing (Kelleher et al., 2013). However, the authors noted several limitations to their study. Firstly, they used an objective measure of physical abuse and bullying but did not assess the subjective impact of these traumatic events on the participant, Kelleher and colleagues acknowledged that the subjective severity of trauma may influence the risk for psychosis. Furthermore, only auditory hallucinations were included as their measure of psychotic symptoms. Despite these limitations, Kelleher and colleagues (2013) well-conceived study does provide some preliminary evidence that the relationship between childhood trauma and psychosis may be causal and dose-dependent.

Over the last decade there has been an accumulation of evidence from well-conducted research studies suggesting that childhood trauma is a risk factor for psychosis (Bendall, Alvarez-Jimenez, Nelson & McGorry, 2013). The relationship also appears to be dose-dependent. Additionally, there is preliminary evidence that suggests that childhood trauma is a putative causal factor for psychosis.

In terms of human suffering and societal expenditure, psychotic disorders are still considered one of the costliest mental disorders (van Os, & Kapur, 2009). By identifying precise etiological factors that contribute to the disorder and then targeting treatment to address the specific underlying mechanisms, the overall efficacy of treatment and standard of care for those affected will likely be improved. Further empirical research into the mechanisms underlying the relationship between trauma and psychosis will improve our diagnostic and ontological understanding of psychosis and psychotic disorders (Ellason & Ross, 1995; Gleaves, May, & Cardeña, 2001).

2.2 Childhood Trauma, Psychosis and the Relevance of Dissociation

Not all individuals who experience severe childhood trauma exhibit symptoms of psychosis. It is likely that the relationship between trauma and psychosis is influenced by the presence or absence of other factors (Bentall et al., 2014). Therefore, current research has shifted to examining the potential mechanisms whereby childhood trauma confers risk of psychosis. A comprehensive investigation and review of all the proposed mechanisms underlying the link between trauma and psychosis is beyond the scope of this thesis (see Williams, Bucci, Berry & Varese, 2018 for a review). However, dissociative experiences have increasingly been identified as a key factor. Therefore, this thesis will focus on the role of dissociation on the relationship between childhood trauma and psychosis.

Historically, the division between psychotic (i.e., schizophrenia) and dissociative disorders (i.e., dissociative identity disorder; DID) was not so clearly delineated (e.g., Moskowitz, 2011). In Bleuler's original conceptualization of schizophrenia, many accounts of the disorder had a flavor of current descriptions of DID, with references to the 'splitting off' of psychic functions, the loss of a unified personality and the switching between different identity states, each associated with a unique voice, affect, cognition and behavior (Bleuler, 1911/1950). For example, the following account of the mental state of a person with schizophrenia could easily be describing that of a modern-day person with DID:

"Single emotionally charged ideas or drives attain a certain degree of autonomy so that the personality falls to pieces. These fragments can then exist side by side and alternately dominate the main part of the personality, the conscious part of the patient. However, the patient may also become a definitely different person from a certain moment onwards." (Bleuler, 1911/1950, p.143)

While a link between psychosis and dissociation has been recognized historically, a comprehensive review of these texts and accounts is beyond the scope of the current thesis. The interested reader is encouraged to review Middleton, Dorahy & Moskowitz (2008); Moskowitz (2008); Ross (2014) for further readings on this matter.

Dissociative phenomena were also recognized as associated features of schizophrenia in two early editions of the DSM (APA, 1952; 1968). It was from the introduction of the DSM-III (APA, 1980) onwards that the mention of dissociation was removed from descriptions of schizophrenia and schizophrenia-spectrum disorders and a new diagnostic category for dissociative disorders was created (Renard et al., 2017).

Since then research focus and the general view of these two diagnostic groups have also

diverged. The origins of dissociative disorders, especially DID is largely assumed to be environmental and in particular the result of early traumatic experiences. While for schizophrenia, neurobiological causes are emphasized (Dorahy et al., 2014; Moskowitz, 2011; Ross, 2007). Given that experiences of childhood trauma are now a well-accepted risk factor and a putative causal factor for psychosis. The potential connection between psychosis and dissociation, both at the symptom and diagnostic levels has been re-opened for examination (Renard et al., 2017; Ross, 2007).

On the diagnostic level, numerous studies have found significant co-occurrence between psychotic and dissociative disorders (e.g., Gainer, 1994; Renard, et al., 2017; Ross, 2009). This is especially the case for those diagnosed with DID and schizophrenia-spectrum disorders (e.g., Ross, 2006; Ross, 2007; Ross, 2009). The research which has examined the co-occurrence of dissociative and psychotic disorders will be discussed in detail in Section 4.5 of this thesis.

On the symptom level, it is theorized that trauma-induced dissociation renders individuals vulnerable to psychosis by depriving them of both 'external anchors' and 'internal anchors' (Allen, Coyne & Console, 1997). The undermining of external anchors hampers reality-testing and renders the individual with posttraumatic symptoms "vulnerable to the nightmarish inner world", furthermore, the loss of inner grounding, that is, the sense of "being connected to one's body, sense of self or identity, and one's own actions, results not only in profoundly impaired reality-testing, but additionally, severe confusion, disorganization and disorientation (Allen et al., 1997, p. 332). The loss of internal and external 'grounding' which results in impaired reality-testing, disruptions to self-awareness and perception might mean that dissociation has a greater impact on positive symptoms of psychosis such as hallucinations and delusions.

Similarly, Read and colleagues (2005) suggest that positive symptoms of psychosis

"follow logically from the existence of a structurally dissociated psyche" (p. 342). In this dissociated mental state, memories, thoughts, feelings, and behaviors intrude into consciousness and these intrusions and/or interpretations of these intrusions underlie the positive symptoms of psychosis (Read et al., 2005). Some researchers have proposed that positive psychotic symptoms (i.e., hallucinations and delusions) are in fact dissociative in nature (Moskowitz Read, Farrelly, Rudegeair & Williams, 2009).

However, while these theories describe the important connection between psychosis and dissociation in the context of trauma, they require further empirical validation. A better understanding of the nature of the relationship between dissociation and psychosis will hopefully lead to more targeted and effective treatments for those experiencing psychosis. The evidence for the relationship between dissociation, psychosis and childhood trauma will be reviewed in detail in Section 4.1 to 4.4 of this thesis.

Chapter 3. Conceptualizing Dissociation

The focus of this thesis was to investigate dissociative experiences and their relationship with psychosis and childhood trauma. Therefore, it is important to have a clearer understanding of the concept of dissociation. In the literature, dissociation is a term that is broadly applied and currently there is a lack of clear consensus regarding its definitive conceptualization. In this chapter, the issues and debate surrounding the definition and conceptualization of dissociation will be presented. The theoretical models of dissociation, including the bipartite model of dissociation (i.e., compartmentalization and detachment) proposed by Holmes and colleagues (2005) will also be discussed. Finally, evidence for the relationship between dissociation and childhood trauma will also be reviewed.

3.1 Issues with Conceptualizing Dissociation

The conceptualization of the term dissociation remains a contentious area of debate. As recently as 2011, the *Journal of Trauma and Dissociation* which is the publication associated with the International Society for the Study of Trauma and Dissociation (ISSTD) dedicated a special issue to debating the definitional scope of dissociation (volume 12, issue 4). In brief, at the core of most contemporary conceptualization of dissociation is the notion that dissociative experiences reflect serious memory and attentional processing dysfunction, changes to consciousness, as well as reduced or altered access to thoughts, feelings perceptions and/or memories (Briere, Weathers & Runtz, 2005). Dissociative experiences are also believed to affect and be affected by the experience and organization of the self, (Carlson, Yates & Stroufe, 2009) and cognition (Bremner, 2010). However, several researchers have raised concerns about the overextension of the term 'dissociation' (e.g., van der Hart & Dorahy, 2009). These authors

suggest that modern models of dissociation make the faulty assumption that most, if not all dissociative phenomena are qualitatively similar and attributable to a common psychological mechanism (i.e., breakdown in mental integration). This assumption leads to the term being too broadly applied (van der Hart & Dorahy, 2009). Additionally, critics of the contemporary conceptualization of dissociation suggest that the overuse of the label dissociation has coincided with a tendency for research in the area to shift focus from the underlying etiology of dissociative experiences to a more descriptive approach (Spiegel & Cardeña, 1991).

Within the current literature, the dissociative domain has become a 'catch-all' for various psychological processes states and associated phenomena (Brown, 2006). This has led to a loss of conceptual clarity. In general psychology, the term dissociation can have multiple meanings. For instance, dissociation can refer to (1) an operationalized concept that reflects what items on measures of dissociation measure (2) a technical term within cognitive psychology, which at the basic level refers to a disconnection between the two major memory subsystems (i.e., procedural memory and declarative memory), and (3) an intrapsychic defense mechanism, referring to a disconnection between the contents in the conscious and unconscious mind (Ross & Halpern, 2009).

Furthermore, within clinical psychology the term dissociation has been used to denote a multitude of psychological processes, states and symptoms, such as (1) identity alterations and dissociated identities, (2) psychogenic amnesia, (3) identity confusion, (4) depersonalization, (5) derealization, (6) absorption, (7) hypnotic suggestibility, (8) trance, (9) possession states, (10) divided attention, (11) reduced awareness, (12) "unexplained" medical symptoms, (13) intrusive thoughts and feelings, (14) flashbacks, and (15) loss of control and "made" actions (Brown, 2006).

In response to the perceived over-inclusiveness of contemporary, broad conceptualizations of dissociation, proponents of a narrow definition have called for a return

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to the historical definition of dissociation (e.g., van der Hart, Nijenhuis, Steele, Brown, 2004). They suggest that in accordance with Pierre Janet's pioneering view of dissociation, only phenomena which derive from a structural, usually trauma-induced division of the personality, or consciousness, such as dissociative amnesia should be considered 'dissociative' (van der Hart & Dorahy, 2009; van der Hart, Nijenhuis, Steele, Brown, 2004). These authors further believe that much of the phenomena currently included in the dissociative domain, such as absorption are not essentially dissociative. While the narrow view emphasizes the traumagenic origins of dissociative phenomena, the broader approach recognizes that dissociative experiences may be the product of any number of underlying processes including the narrowing of the field of consciousness, parallel streams of consciousness, alterations in conscious experience in addition to trauma and posttraumatic responses (Steele, Dorahy, van der Hart & Nijenhuis, 2009; van der Hart & Dorahy, 2009).

3.1.1 Issues with Diagnostic Definitions and Classifications

The lack of consensus regarding the conceptualization of dissociation is further highlighted by key differences in the definition and scope of dissociative symptoms and disorders described in the two main classification systems of psychiatric conditions – the DSM-5 (American Psychiatric Association, 2013) and the International Classification of Disease and Related Health Problems- tenth edition (ICD-10; World Health Organization (WHO), 1992). The DSM-5 defines dissociation as a disruption and/or discontinuity in the normally integrated functions of consciousness, memory, identity, or perception (American Psychiatric Association, 2013, p. 291). Similarly, the ICD-10 recognizes dissociation as a complete or partial loss of normal integration of memories, identity awareness and sensations, however, it further suggests that deficits in the integration of bodily movements is also a key component of dissociative experiences (WHO, 1992). This acknowledgment of the motor and somatic

aspects of dissociation may explain why conversion and dissociative disorders are listed together in the ICD-10 but are separate in the DSM-5. Both diagnostic manuals also vary significantly in their descriptions and classification of dissociative disorders. For example, the dissociative disorders recognized in the DSM-5 are dissociative identity disorder (DID), dissociative amnesia including dissociative fugue, depersonalization/derealization disorder, other specified and not otherwise specified dissociative disorders. By contrast the dissociative (conversion) disorders listed by the ICD-10 include dissociative amnesia, dissociative fugue, dissociative stupor, trance and possession disorders, dissociative motor disorders, dissociative convulsions, dissociative anesthesia and sensory loss, mixed dissociative (conversion) disorders and other specified or unspecified dissociative (conversion) disorders. The inconsistencies between these two major classification systems is symbolic of the current lack of a united referent in terms of dissociative phenomena (Spiegel & Cardeña, 1991; Cardeña, 1994).

In clinical psychology and psychiatry, the general concept of dissociation expounded by the APA has become a 'working definition' for research and practice. This conceptualization is also reflected in the various measures used to capture and quantify dissociative experiences. For example, a similar conceptualization of dissociation defined as a "lack of normal integration of thoughts, feelings and experiences into the stream of consciousness and memory" was adopted by Bernstein and Putnam (1986, p.727) for the development of the most widely used self-report scale of dissociation – the Dissociative Experiences Scale (DES). Commonly used diagnostic scales for dissociative disorders such as the Dissociative Disorders Interview Schedule (DDIS; Ross, Hebert, Norton, Anderson, Anderson & Barchet, 1989) and the Structured Clinical Interview for DSM-IV – Dissociative disorders revised (SCID-D-R) use similar definitions of dissociation and dissociative symptoms as those outlined by the APA. The specific symptoms of clinical dissociation include

derealization (the sense of unreality about the external world), depersonalization (the sense of alienation and detachment from one's body and self) and psychogenic amnesia (inability to recall autobiographical information that is not consistent with normal forgetting, amnesia may be localized, selective or generalized), dissociated identities (fragmentation of identity) (APA, 2013, Merckelbach & Muris, 2001; Spiegel et al., 2011). In general, the course and severity of these symptoms in conjunction with the presence of other diagnostic criteria such as functional impairment and symptoms that are not due to the physiological effects of substances or other medical conditions constitutes the dissociative disorders presented in the DSM-5 (APA, 2013). These operationalized definitions of dissociation enable empirical investigation as well as clinical practice to proceed. However, the precise ontology of the dissociative domain and the associated phenomena requires ongoing conceptualization and refinement.

3.2 Is Dissociation a Dimensional or Categorical Construct?

Attempts to clarify the concept of dissociation have centered around finding potential ways to separate the unitary concept of dissociation by identifying distinct types of dissociation. The current conceptualization of dissociation positions dissociative experiences on a single continuum, with states ranging from relatively minor changes in consciousness found in everyday contexts, for example 'daydreaming', to processes that form the basis of major psychopathology such as the pathological splitting of identity and dissociative disorders. This unitary model implies that dissociative experiences vary only across a dimension of severity and degree of dysfunction (Bernstein & Putnam 1986; Vogel, Schatz et al., 2009). Evidence for the unitary, dimensional model comes from a body of work utilizing the DES which demonstrated that those with more 'severe' dissociative disorders (i.e., DID) tend to report significantly higher scores on the DES than those with other dissociative

psychopathology (i.e., dissociative disorders not otherwise specified (DDNOS)), and other clinical and non-clinical controls (Frischholz, Braun, Sachs & Hopkins, 1990; van Ijzendoorn & Schuengel, 1996). However, other authors have offered an alternative explanation for these group differences, Putnam et al., (1996) found that the mean scores for each group were not uniformly distributed and were the function of the proportion of participants with high scores on the measure of dissociation present in each group. They further suggest that these within-group differences contradict the dimensional models and provide evidence for distinct types of dissociative experiences (Putnam et al., 1996).

3.2.1 Pathological Versus Non-Pathological Dissociation

While the continuous model remains the most dominant paradigm of dissociation, it is not universally supported. Recent reconceptualizations have considered various typological approaches (Allen, 2001; Barlow & Freyd, 2009; Brown, 2002; Cardeña, 1994). One such approach attempts to distinguish between 'normal' and 'abnormal' types of dissociation (Barlow & Freyd, 2009; Dell, 2009a; Bernstein & Putnam, 1986; Putnam et al., 1996). According to this approach, dissociative experiences at the more severe, pathological end represent a qualitatively distinct taxon compared to less severe dissociation (e.g., Waller, Putnam & Carlson, 1996). Pathological dissociation might include experiences such as psychogenic amnesia, persistent experiences of depersonalization, identity confusion and involuntary identity alteration (Barlow & Freyd, 2009; Simeon, Knutelska & Nelson, Guralnik, & Schmeidler, 2003; Waller et al., 1996). By contrast, normal dissociative experiences may include, daydreaming, absorption, fantasy-proneness and hypnotizability (Barlow & Freyd, 2009; Tellegen & Atkinson, 1974; Waller et al., 1996)

The assumption of a pathological dissociation taxon led to the development of the Dissociative Experiences Scale- Taxon (DES-T). The DES-T consists of eight questions

derived from existing DES items, which are believed to measure pathological dissociation (Waller, et al., 1996). According to proponents of the DES-T, taxon membership should correspond with a clinical diagnosis of a dissociative disorder (Waller et al., 1996; Waller & Ross, 1997). The DES-T has demonstrated some ability to discriminate between those with or without a dissociative disorder, based on whether an individual's score is taxon-positive or taxon-negative respectively (Waller & Ross, 1997).

However, Leavitt (1999) criticized the efficacy of the DES-T to capture pathological dissociation. Leavitt (1999) compared the ability of the DES-T and DES to accurately classify those with dissociative disorders (e.g., dissociative amnesia, depersonalization disorder, DDNOS, DID) and other non-dissociative psychiatric conditions. They found that the DES-T was no more accurate in identifying those with dissociative disorders than the DES itself. The overall sensitivity, which is the ability to correctly identify those with a dissociative condition (i.e. true positive rate) of the DES-T was only slightly better than chance levels (58%) and worse compared to the overall sensitivity of the DES (76%). Furthermore, the false negative rate (i.e., those with dissociative disorders who were not classified as such) was higher for the DES-T compared with the DES (52% vs 34%). In terms of specific dissociative disorders, the sensitivity of both the DES-T and DES were best for the most severe forms of dissociation (i.e., DID), 89.7% and 94.8% respectively, compared with other dissociative conditions. For dissociative amnesia the sensitivity of the DES-T was 34.6% compared to 69.2% for the DES; depersonalization disorder, (DES-T = 30.7% vs DES = 53.8%) and DDNOS (DES-T = 69.2% vs DES = 84.6%). Additionally, Leavitt (1999) demonstrated significant correlations between the DES-T and 'normal' dissociation (the absorption subscale of the DES) across all psychiatric conditions.

Evidence supporting pathological dissociation as being a distinct type of dissociation is mixed and by no means settled (Leavitt, 1999; Rodewald, Dell, Wilhelm-Gößling & Gast,

2011; Simeon, Knutelska et al., 2003).

3.3 Detachment and Compartmentalization: A Bipartite Model

Finding ways to refine our understanding of dissociation is a valuable endeavor, however, separating dissociation into types based on pathology may be of limited use. Judging whether a phenomenon is 'pathological' is somewhat subjective and relies on a set of external references or criteria to determine what is pathology. Perhaps a more useful way of separating types of dissociation moves beyond the severity and/or functional impact of the experience and considers the unique processes that might underlie them. Several authors have converged on a bipartite model and argue that dissociation consists of phenomena that can be classified into two ontologically distinct sets of processes (Allen, 2001; Brown, 2006; Cardeña, 1994; Holmes et al., 2005). The two types of dissociation are labeled *detachment* and *compartmentalization*. Each of these dissociative domains encompass symptoms and experiences generated by unique causal processes which result in qualitatively distinct manifestations (Brown 2006; Holmes et al., 2005). It is further suggested that detachment and compartmentalization exist on their own continuum of severity and degree of functional impact (Brown, 2006; Holmes et al., 2005).

3.3.1 Detachment

Detachment consists of symptoms that reflect alterations of consciousness, leading to feelings of unreality and a profound sense of disconnection (or detachment) in domains such as the self (i.e., depersonalization), body (i.e., out-of-body experiences), external world (i.e., derealization) and emotional experiences (i.e., emotional numbing) (Brown 2006; Holmes et al., 2005). Experiences that are described as 'going through the motions' or 'experiencing events without really feeling as though they were happening', viewing the world as 'lifeless'

and 'two-dimensional' are also ascribed to detachment dissociation (Allen, Console & Lewis, 1999; Holmes et al., 2005).

Detachment is believed to be the product of a hardwired, adaptive strategy designed to protect the individual from debilitating distress in the face of extreme threat, fear or anxiety. This threat can be from an internal or external source (Holmes et al., 2005; Sierra & Berrios, 1998). Symptoms of depersonalization and derealization are frequently associated with anxiety (e.g., Cassano, Petracca, Perugi, Toni, Tundo & Roth, 1989; Marshall, Schneier, Lin, Simpson, Vermes & Leibowitz, 2000; Sierra & Berrios, 1998; Simeon, Gross, Guralnik, Stein, Schmeidler & Hollander, 1997; Sterlini & Bryant, 2002) and anxiety may contribute to the onset and maintenance of experiences of dissociative detachment (Hunter, Phillips, Chalder, Sierra & David, 2003; Sierra & Berrios, 1998). It has also been suggested that there is an overlap between detachment and many posttraumatic experiences, such as the emotional numbing found in PTSD and the concept of peri-traumatic dissociation which essentially describes experiences of detachment arising during the course of a traumatic event (Dagleish & Power, 2004; Holmes et al., 2005).

According to supporters of the theory, detachment experiences have a 'core' neurophysiological profile, that is characterized by a top-down suppression of limbic affective systems accompanied by an activation of the right prefrontal cortex. These neuropsychological processes produce a mental state of vigilance, alertness and emotional numbing (Holmes et al., 2005; Sierra & Berrios, 1998). A number of neurophysiological studies of those with depersonalization disorder have found reduced activations in regions of the brain associated with emotional experience and increased activity in areas associated with emotional regulation compared with normal and clinical controls (Phillips et al., 2001; Sierra et al., 2002). Increasing symptoms of depersonalization was associated with a reduction in levels noradrenaline in those with depersonalization disorder (Simeon, Guralnik, Knutselska, Yehuda & Schmeidler, 2003).

Overall, the findings from these neuropsychological studies suggest a degree of deactivation or 'suppression' of the sympathetic nervous system. Experiences of detachment may be acute and/or transient (Holmes et al., 2005). Extended periods of detachment may eventually develop into chronic and recurrent conditions such as depersonalization disorder (Brown, 2006) or maladaptive daydreaming (Somers, Lehrfeld, Bigelsen & Jopp, 2016).

3.3.2 Compartmentalization

According to the bipartite model, symptoms of compartmentalization are characterized by an underlying deficit in the "ability to deliberately control processes or actions that would normally be amenable to such control" (Holmes et al., 2005, p. 7). Such deficits cannot be overcome through acts of will, but are reversible in principle. These compartmentalized functions continue to operate 'normally' and influence thoughts, feelings and behavior (Brown, 2006; Holmes et al., 2005). Dissociative amnesia, fugue states and DID are considered to be conditions of compartmentalization (Brown, 2006). According to Holmes and colleagues (2005) the affected information and processes are inaccessible to conscious recollection and control; however, they remain intact within the cognitive system. Compartmentalization phenomena also incorporates the 'unexplained' neurological symptoms associated with conversion disorders and instances of 'somatoform dissociation' (Holmes et al., 2005; Nijenhaus, Spinhoven, van Dyck, van der Hart & Vanderlinden, 1996; 1998).

Case studies of individuals with unexplained neurological conditions associated with conversion disorder (e.g., conversion blindness), and pseudo-epileptic seizures provide some support for the notion that compartmentalized experiences and memories are not absent like in 'true' conditions (e.g., congenital blindness or epilepsy) but merely inaccessible to conscious awareness. These compartmentalized experiences still have ongoing influence on behavior. For instance, in a comparative study of those with epilepsy and pseudo-epilepsy, both groups

initially reported amnesia associated with generalized seizures (epileptic group) or pseudo-seizures (pseudo-epileptic group). Following a 'seizure' in the study, participants were hypnotically induced and given suggestions designed to aid in the recall of events surrounding ictus. Those with pseudo-epilepsy were able to accurately remember information occurring during their pseudo-seizure, whereas those with 'true' seizures had no recollection (Kuyk, Spinhoven & van Dyck, 1999). In a case study of conversion blindness, despite the participant reporting an absence of visual experience, her behavior could still be influenced by complex visual stimuli (Bryant & McConkey, 1989). This case implies that in conversion blindness the visual system remains intact, however, the products of visual processing have become 'compartmentalized' and inaccessible to consciousness (Holmes et al., 2005).

3.3.3 Evidence for the Bipartite Model

According to proponents of the bipartite model, evidence for the typological structure of detachment-compartmentalization dissociation primarily derive from factor analytic studies of the DES which have consistently found distinctive factors that could be separated into detachment (i.e., the absorption and depersonalization/derealization subscales) and compartmentalization (i.e., amnesia subscale) (e.g., Frischholz et al., 1991; Goldberg, 1999; Mazotti et al., 2016; Ross, Joshi & Currie 1991; Sanders & Green, 1994; Stockdale, Gridley, Balogh & Holtgraves, 2002). Further evidence for the separability of compartmentalization and detachment dissociation is provided by phenomenological studies which have shown that those with somatization disorder rarely endorse symptoms of depersonalization/derealization on the SCID-D, instead reporting higher levels of amnesia (Brown, Schrag & Trimble, 2005). By contrast, studies of depersonalization disorder have found low endorsement of amnesia and other symptoms of compartmentalization (Baker et al., 2003; Simeon, Guralnik et al., 2003).

However, while a clear-cut distinction between compartmentalization and detachment can be described theoretically, in reality the separation may not be so straightforward and such categories are likely to be interactive and not entirely mutually exclusive (Spitzer, Barnow, Freyberger, & Grabe, 2006; Vogel, Braungardt, Grabe, Schneider & Klauer, 2013). The bipartite model requires further theoretical elaboration and empirical validation. However, it represents a step-forward in clarifying the concept of dissociation. Using shared underlying cognitive, neurophysiological and psychosocial processes as the basis for classifying types of experiences in the dissociative domain offers a more objective and scientifically verifiable approach to conceptualizing dissociation.

3.4 Dissociation and Trauma

It is difficult to provide a thorough account of dissociation without considering the relevance of trauma. The notion that there is a direct and robust link between trauma and dissociation is longstanding and appealing (e.g., Diseth, 2005). Although the 'trauma' model of dissociation is generally accepted in the literature, as with other aspects of the conceptualization of dissociation, there are differing opinions as to the necessity of trauma in the development of dissociation.

Some narrow theorists hold an essentialist view. They argue that only experiences of dissociation which are the direct result of trauma can be considered truly 'dissociative' and all other experiences in the current dissociative domain are not (e.g., Nijenhaus & Van der Hart, 2011). Nijenhaus and van der Hart (2011) argue for defining dissociation as a lack of integration of the personality, which manifests as the existence of two or more dissociative parts of the personality (i.e., structural dissociation of the personality). Furthermore, they suggest that the domain of dissociative symptoms should only constitute those experiences

which arise from these structurally dissociated parts (Nijenhaus & Van der Hart, 2011). However, this narrow view has been criticized as being too absolutist and dogmatic and lacking adequate empirical validation (Cardeña, 2011; Cardeña & Bowman, 2011; Dell, 2011).

On the other end of the spectrum, some researchers argue that the link between trauma and dissociation is overstated at best and dubious at worst (Merckelbach & Muris, 2001). In a critical review of the evidence, Merckelbach and Muris (2001) cite studies that show significant positive associations between dissociation and measures of fantasy-proneness, heightened suggestibility and cognitive failures (Giesbrecht, Lynn, Lillienfeld & Merckelbach, 2008). The authors interpret these findings as indicating a positive response bias and a tendency for those with dissociation to confabulate or exaggerate experiences of trauma (Merckelbach, Muris, Horselenberg & Stougie, 2000; Merckelbach & Muris, 2001). Proponents of this 'fantasy' model of dissociation argue that dissociation is causally unrelated to antecedent trauma and the relationship is mediated or moderated by fantasy-proneness, absentmindedness and executive dysfunction, which leads to false memories in the self-reporting of trauma (Giesbrecht et al., 2008; Merckelbach & Muris, 2001).

However, a more recent review of the evidence compared the predictive validity of the 'fantasy' model of dissociation with a 'trauma' model and found little scientific support for the 'fantasy' model (Dalenberg et al., 2012). The 'trauma' model of dissociation suggests that dissociation is intimately related to traumatic stress and adversity. However, other biopsychosocial factors such as genetic vulnerability, psychiatric vulnerability, the developmental and social environment of the individual, and posttraumatic stress and support likely mediate and/or moderate the relationship in some cases (Dalenberg, et al., 2012).

Overall, in an extensive review of the existing data, Dalenberg and colleagues (2012) meta-analyzed 38 of the most rigorous studies and found a consistent relationship between trauma and dissociation. The relationship was moderate in strength with an average weighted

r estimate of .32. The relationship between trauma and dissociation remained significant even when objective measures of trauma were used (Dalenberg et al., 2012). These significant findings from objective measures of trauma suggest that associations between trauma and dissociation were not due to a response bias and/or fabricated memories. Dissociation was also temporally related to trauma and trauma treatment (Dalenberg et al., 2012). Furthermore, dissociation was predictive of trauma history even when fantasy-proneness was controlled for.

Contrary to predictions made by the fantasy model, dissociation was not reliably associated with suggestibility, nor was there evidence to suggest greater inaccuracies in the recovered memories of those with higher levels of dissociation (Dalenberg et al., 2012). While the overall effect size between the two variables was only moderate in magnitude and considered heterogeneous, Dalenberg and colleague's (2012) review provides support for the 'trauma' model of dissociation over the 'fantasy model'.

At the very least there is a substantial amount of evidence supporting a correlation between various forms of trauma such as sexual, physical abuse and neglect and subsequent dissociative experiences (Chu & Dill, 1990; Dalenberg et al., 2012; Kirby, Chu & Dill, 1993; Ogawa, Sroufe, Weinfield, Carlson & Egeland, 1997; Sanders & Giolas, 1991; Saxe, van Der Kolk, Berkowitz, Chinman, Hall & Lieberg, 1993; Zlotnick, et al., 1995). Studies have also shown that the degree of dissociation is associated with the severity, chronicity and age of onset of trauma using retrospective self-report methodologies (e.g., Chu & Dill, 1990; Kirby et al., 1993; Waldinger, Swett, Frank & Miller, 1994) as well as a prospective study (Ogawa et al., 1997).

Numerous studies have also found a high incidence of childhood trauma in adults and children with heightened levels of dissociative experiences and dissociative disorders (e.g., Saxe et al., 1993; Simeon, Guralnik, Schmeidler, Sirof, & Knutelska, 2001). Several studies have also demonstrated that the severity of adult dissociation is related to the onset age of

trauma suggesting that the earlier the experience of maltreatment the greater the vulnerability to dissociative psychopathology (e.g., Irwin, 1994; Kirby et al., 1993; Van IJzendoorn & Schuengel, 1996; Zlotnick, Shea, Pearlstein, Begin, Simpson & Costello, 1996).

The association between dissociation and childhood physical, sexual abuse and neglect has been demonstrated across different sample types including non-clinical (e.g., Briere & Runtz, 1988; Irwin, 1996; Ross, Joshi & Currie, 1990; Sanders & Becker-Lausen, 1995) and clinical groups (e.g., Briere & Zaidi, 1989; Chu & Dill, 1990; Kirby et al., 1993; Lipschitz, Kaplan, Sorkeen & Chorney, 1996; Putnam et al., 1996). A relationship between trauma and dissociation has also been found in a number of diagnostic groups which are considered to be 'trauma-spectrum' disorders including borderline personality disorder (BPD) (e.g., Watson, Chilton, Fairchild & Whewell, 2006), posttraumatic stress disorder (PTSD) (e.g., Briere, Scott, & Weathers, 2005) and the dissociative disorders (Nijenhuis, Spinhoven, van Dyck, van der Hart & Vanderlinden, 1998).

Indeed, a recent meta-analysis found a significant, moderate relationship between total childhood trauma and dissociation [$r = .33$, 95% CI (.27 .39)] in an aggregated sample ($n = 2199$) of those with serious mental illness (i.e., schizophrenia-spectrum disorder, personality disorder, bipolar affective disorder) (Rafiq, Campodonico & Varese, 2018). Rafiq and colleagues (2018) further found small but significant relationships between dissociation and total childhood trauma scores as well as specific trauma types (i.e., sexual, physical, emotional abuse and physical neglect) in those with personality disorders ($n = 630$). By contrast, the relationship between childhood trauma and dissociation was not significant in groups with bipolar disorder (Rafiq et al., 2018). Results from the meta-analysis indicated that the most robust relationships between childhood trauma and dissociation were found in groups with schizophrenia-spectrum disorders (Rafiq et al., 2018). Evidence for an association between childhood trauma and dissociation in groups with psychosis and psychotic disorders will be

reviewed in depth in Chapter 4 of this thesis.

In sum, the clinical importance of dissociation is well-recognized, however, it remains a 'semantically open' term (Spitzer et al., 2006). A lack of consensus regarding its conceptualization and etiology diminishes its potential value to research and clinical practice. However, there appears to be substantial improvements to our understanding of dissociation in recent years. Ongoing refinement and empirical validation of theoretical models of dissociation, such as the bipartite model is required for the field to progress towards a clearer, more unified conceptualization of dissociation. Furthermore, there is increasing evidence that dissociative experiences are amongst the array of possible psychological sequelae of early traumatic experiences.

Chapter 4. Childhood Trauma, Dissociation and Psychosis

In this chapter, evidence for the relationship between childhood trauma, dissociation and psychosis will be comprehensively and critically reviewed. This includes a review of (1) studies that have examined the relationship between dissociation and psychotic symptoms in general and hallucinations and delusions more specifically, (2) studies that have examined dissociative mechanisms on the relationship between childhood trauma and psychotic symptoms and (3) studies investigating the prevalence of dissociative disorders and clinically significant dissociative symptoms in those with psychotic disorders. Furthermore, how hallucinations and delusions may be related to the two types of dissociation outlined in the bipartite model (i.e., compartmentalization and detachment) will also be reviewed and examined in this chapter. Finally, key theoretical frameworks accounting for the co-occurrence of dissociative and psychotic disorders and symptomatology will also be discussed in this chapter.

4.1 The Relationship Between Dissociation and Trauma in Psychotic Disorders

When compared with people without a history of childhood trauma, those with psychotic disorder and experiences of childhood trauma scored significantly higher on measures of dissociation (Greenfield et al., 1994; Perona-Garcelán et al., 2010; Schroeder et al., 2016).

Several studies have found correlations between childhood trauma and the severity of dissociation in those with schizophrenia-spectrum disorders (e.g., Álvarez et al., 2015; Braehler et al., 2013; Goff, Brotman, Kindlon, Waites & Amico, 1991a; Holowka, King, Saheb, Pukall & Brunet, 2003; Lysaker & LaRocco, 2008; Perona-Garcelán, Carrascoso-López et al., 2012;

Şar, et al., 2010; Schroeder, Langeland, Fisher, Huber & Schäfer, 2016). In one study of those with schizophrenia-spectrum disorders, it was shown that dissociation was particularly associated with trauma experienced in childhood compared to adulthood (Perona-Garcelán, et al., 2010). The relationship between childhood trauma and dissociation in an aggregated sample of those with schizophrenia-spectrum disorder was recently meta-analyzed (n = 1192) (Rafiq et al., 2018). The results from the Rafiq and colleagues' (2018) meta-analysis indicated a significant, moderate relationship between total childhood trauma and dissociation, [r = .39, 95% CI (.31, .46)].

There has been an accumulation of studies demonstrating associations between a broad range of childhood trauma types and dissociation in those with psychosis. Holwoka and colleagues (2003) found that all maltreatment types (e.g., emotional abuse, physical abuse, sexual abuse and physical neglect) except childhood emotional neglect were associated with dissociation as measured by the DES. However, a few studies suggest that emotional abuse may be particularly important to dissociative experiences in those with psychosis (Braehler et al., 2013; Holowka et al., 2003). Holowka and colleagues (2003) found that after controlling for the effect of all four other trauma types, only the correlation between emotional abuse and dissociation remained significant (r = .77). Furthermore, the degree of emotional abuse accounted for 70% of the variance in the severity of dissociation (Holowka et al., 2003). Similarly, Braehler and colleagues (2013) found that childhood emotional abuse had the strongest relationship with dissociation.

By contrast, Vogel, Spitzer et al., (2009) found that childhood physical neglect had the strongest association with dissociation, followed by emotional abuse. Other childhood trauma types were not found to be associated with dissociation in Vogel, Spitzer et al.'s (2009) study. Braehler and colleagues (2013) found that the relationship between physical neglect and childhood trauma was stronger in males with psychosis compared with females.

Other studies have indicated that childhood sexual abuse has the strongest relationship with dissociation (Goff et al., 1991a; Schäfer et al., 2012; Schroeder et al., 2016). In a study of 71 adult inpatients with FEP, Greenfield and colleagues (1994) found that those who had experienced combined physical and sexual abuse reported more dissociative symptoms as measured by the Questionnaire of Experiences of Dissociation (QED) than those who had experienced a single trauma type or those without a trauma history.

In short, the association between specific types of traumatic experience in childhood and dissociation are mixed. That is, there is a lack of consistency in findings for a certain type of trauma having the 'strongest' relationship with dissociation. Most types of trauma described in the CTQ have at one stage been implicated as being the 'most important' to dissociative experiences, for instance emotional abuse (Álvarez et al., 2015; Braehler et al., 2013; Holowka et al., 2003), sexual abuse (Álvarez et al., 2015; Schäfer et al., 2012; Schroeder, et al., 2016), physical abuse (Álvarez et al., 2015; Şar et al., 2010), and physical neglect (Şar et al., 2010; Vogel, Spitzer et al., 2009). Indeed, Rafiq and colleagues' (2018) meta-analysis found that in those with schizophrenia-spectrum disorder, all types of childhood adversity (i.e., sexual, physical, emotional abuse as well as physical and emotional neglect) were significantly associated with dissociation with the exception of general neglect. Overall summary effect sizes for the relationship between different types of childhood trauma and dissociation in those with schizophrenia-spectrum disorders ranged from $r = .22$ to $r = .41$ (Rafiq et al., 2018).

One explanation for findings may be that the specificity of the trauma type might be less important to the relationship with dissociation than the cumulative effect of multiple traumas. It may be that while each individual with psychosis in these studies had a distinct profile of traumatic experiences, they demonstrated a similar prevalence of trauma overall. This would explain why different studies find that different trauma types have a stronger relationship with dissociation. Indeed, Álvarez and colleagues (2015) found that the experience

of multiple types of trauma (e.g., polytraumatization) was associated with more severe dissociation compared with non-polytraumatization.

The relationship between the person with psychosis and their abuser may also be important to experiences of dissociation. Early experiences of sexual abuse and paternal dysfunction (e.g., recurrent illness, anxiety, depression, or alcohol misuse in the father) were the best predictors of dissociation compared with other adversity types such as witnessing domestic violence in childhood and physical violence in adulthood (Schroeder et al., 2016). Additionally, in adult inpatients with FEP, those who had experienced parental abuse had significantly more dissociative symptoms as measured by QED than people who either had been abused by a non-parental figure or had no trauma history (Greenfield et al., 1994). Furthermore, when testing for the independent and interaction effects of abuse by a parental figure and type of abuse (physical and/or sexual abuse) on dissociative experiences, the only significant effect on dissociation was the relationship between the abuser and abused (Greenfield et al., 1994).

The phase of disorder also appears to affect the relationship between childhood trauma and dissociation in those with schizophrenia (Braehler et al., 2013). Those with chronic schizophrenia ($n = 43$) had the highest reported levels of dissociation compared with FEP ($n = 62$) who scored significantly higher than non-psychiatric controls ($n = 66$). The relationship between childhood trauma and dissociative symptoms was the strongest in those with chronic schizophrenia compared with FEP and non-psychiatric controls (Braehler et al., 2013). The relationship between childhood trauma and dissociation also seems to be affected by more proximal clinical factors. For instance, during the acute stages of psychosis (i.e., at the point of inpatient admission), the best predictor of dissociation was the presence of positive psychotic symptoms, however, the best predictor of dissociation when participants were stabilized was experiences of childhood trauma (Schäfer et al., 2012).

Only a few studies have examined the relationship between childhood trauma and dissociation in FEP (Braehler et al., 2013; Greenfield et al., 1994). Given that significant differences in the relationship between trauma and dissociation were found between those with FEP and those with chronic schizophrenia (e.g., Braehler et al., 2013), further investigation in samples with early psychosis is warranted.

4.2 Dissociation and Psychotic Symptomatology

Current research suggests that dissociation has a stronger association with the positive symptoms of psychosis compared to negative symptoms (Lysaker & LaRocco, 2008; Ross, Anderson & Clark, 1994; Schäfer et al., 2012; Schroeder et al., 2016; Spitzer, Haug & Freyberger, 1997). In those with schizophrenia, several studies found significant positive correlations between measures of dissociation (i.e., the DES) and the positive subscale of the PANSS, while no correlation between the DES and the negative subscale were reported (Schroeder, et al., 2016; Spitzer, et al., 1997). In those with subclinical psychosis, dissociation as measured by the Traumatic Dissociation Scale (TDS), positively correlated with attenuated positive psychotic symptoms (i.e., scores on the Prodromal Questionnaire), and mediated the relationship between traumatic experiences and attenuated positive psychotic symptoms (Anglin, Polanco-Roman & Lui, 2015).

Indeed, specific associations are frequently found between dissociation and the hallmarks of positive psychotic symptoms – hallucinations and delusions. While early investigations found correlations between dissociation and hallucinations as well as dissociation and delusions, it was suggested that dissociation has greater implications for the development of hallucinations than delusions (e.g., Kilcommons & Morrison, 2005; Perona-Garcelán et al., 2010). Consequently, there are vastly more studies which focus exclusively on

examining the relationship between dissociation and hallucinations compared with delusions. Therefore, relative to delusions, the relationship between hallucinations and dissociation is more empirically established and more is known about the potential processes and phenomena associated with the relationship. The current state of evidence for the relationship between dissociation and hallucinations as well as dissociation and delusions are discussed separately in Sections 4.2.1 and 4.2.2 below.

4.2.1 Dissociation and Hallucinatory Experiences

The relationship between dissociation and hallucinations have been examined in clinical and non-clinical groups (Pilton, Varese, Berry & Bucci, 2015). In studies of dissociation and hallucinations, various aspects of the hallucinatory experiences such as hallucination-proneness, attenuated hallucinatory experiences, hallucinations in various sensory modalities (e.g., auditory, visual, olfactory, gustatory, and somatosensory) as well as auditory hallucinations only (i.e., voice-hearing) have been investigated.

Pilton and colleagues (2015) conducted a well-designed systematic review and meta-analysis of studies that investigated the relationship between dissociation and hallucinations. They systematically reviewed thirty-one studies: 12 studies recruited non-clinical participants ($n = 2137$) and 19 studies involved clinical participants. The various diagnoses investigated in these clinical studies included psychosis ($n = 717$), DID ($n = 84$), and PTSD ($n = 184$). Non-clinical control participants ($n = 287$) were also recruited for the purpose of comparison making with the clinical sample. Pilton and colleagues (2015) reported that the most common measure of dissociation used was a form of the DES and it was included in 22 of the studies reviewed. The most common measures used to assess hallucinations in the reviewed literature were the PANSS, used in 10 studies and the Launay-Slade Hallucinations Scale-Revised (LSHS-R; Bentall & Slade, 1985), used in 7 of the reviewed studies. The LSHS-R is a measure designed

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to capture clinical and subclinical auditory and visual hallucinations in the general population and is considered a measure of 'hallucination-proneness'.

The systematic review identified twelve studies that examined the relationship between dissociation and hallucinations in groups with psychosis (Kilcommons & Morrison, 2005; Lysaker & Larocco, 2008; Maggini, Raballo, & Salvatore, 2002; Offen, Thomas, & Waller, 2003; Offen, Waller, & Thomas, 2003; Perona-Garcelán et al., 2010; Perona-Garcelán et al., 2008; Perona-Garcelán, Carrascoso-López et al., 2012; Perona-Garcelán, García-Montes et al., 2012; Spitzer, Haug, & Freyberger, 1997; Varese, Barkus, & Bentall, 2011; Varese, Udachina, Myin-Germeys, Oorschot, & Bentall, 2011; Varese, Barkus et al., 2012). Five studies utilized a correlational design and found significant bivariate relationships between dissociation and hallucinations when using the DES and the hallucinations subscale of the PANSS (Kilcommons & Morrison, 2005; Perona-Garcelán, Carrascoso-López et al., 2012), the DES and the LSHS-R (Varese, Barkus et al., 2012), the DES and the Beliefs About Voices Questionnaire (Offen, Thomas et al., 2003), as well as the dissociation scale of the Trauma Symptoms Inventory (TSI) and the PANSS (Lysaker & LaRocco, 2008). Studies that employed multiple regression analysis found that dissociation best predicted hallucinations (Kilcommons & Morrison, 2005; Perona-Garcelán et al., 2008; Perona-Garcelán, García-Montes et al., 2012) even after accounting for the effect of other potential predictors such as the cumulative effects of trauma (Kilcommons & Morrison, 2005), private self-consciousness (Perona-Garcelán et al., 2008) and dysfunctional metacognitive beliefs (Perona-Garcelán, García-Montes et al., 2012).

The systematic review (Pilton et al., 2015) identified seven studies that utilized a between-groups design. Five studies compared levels of dissociation in groups of those with schizophrenia with a history of hallucinations and those without (Perona-Garcelán et al., 2008; Perona-Garcelán, García-Montes et al., 2012; Spitzer et al., 1997; Varese, Udachina et al.,

2011; Varese, Barkus et al., 2012). Overall, these between-groups studies found that people with psychosis and a history of hallucinations report significantly greater levels of dissociative experiences that those without hallucinations. Although differences in levels of dissociation between current hallucinators and remitted hallucinators was not statistically significant (Perona-Garcelán et al., 2008; Varese, Barkus et al., 2012). Two studies examined differences in hallucinations between those who experience dissociation and those who do not (Maggini et al., 2002; Perona-Garcelán et al., 2010). High-dissociators (DES score $\geq$ 25) were shown to have significantly greater scores on the hallucinations subscale of the PANSS compared with low-dissociators (DES score < 25) (Perona-Garcelán et al., 2010). Furthermore, those people considered 'depersonalized' on select dissociative items of the Bonn Scale for the Assessment of Basic Symptoms demonstrated higher scores on the hallucinations section of the Scale for the Assessment of Positive symptoms (SAPS) compared to those who were not depersonalized.

One study examined a more temporal relationship between dissociative experiences and hallucinations using an experience sampling method in people with schizophrenia (Varese et al., 2011). The authors found that dissociation, as measured by the mean score of three items assessing 'detachment from experience', taken from the 'acting-with-awareness' subscale of the Five Factors Mindfulness Questionnaire predicted the occurrence of hallucinations in times of high stress. In addition, when compared with non-hallucinating and non-clinical controls, hallucinating participants reported a greater increase in dissociation in response to daily life stress.

Several limitations of these studies examining the relationship between hallucinations and dissociation in those with psychosis were noted (Pilton et al., 2015). Firstly, most of these studies recruited a relatively small sample of participants, this potentially restricts the statistical power of the study as well as the generalizability of the results. Secondly, only a few studies controlled for possible confounding variables (Kilcommons & Morrison, 2005; Perona-

Garcelán et al., 2008; Perona-Garcelán et al., 2010; Perona-Garcelán, Carrascoso-López et al., 2012; Perona-Garcelán, García-Montes et al., 2012; Spitzer et al., 1997; Maggini et al., 2002; Varese, Udachina et al., 2011). However, no studies of those with psychosis assessed or controlled for potentially relevant comorbid conditions such as dissociative disorders. Lastly, the reliance on mental health services as a source of participant recruitment for the majority of studies may have led to sampling bias (Pilton et al., 2015)

In addition to groups with psychosis, Pilton and colleagues (2015) identified three studies that had examined the relationship between dissociation and hallucinations in those with PTSD (Anketell et al., 2010; Brewin & Patel, 2010). Anketell and colleagues (2010) study found that those with hallucinations, as measured on the PANSS, reported significantly greater experiences of dissociation compared to those without hallucinations. All three studies found a significant relationship between dissociation and hallucinations. However, there was a methodological flaw in the two studies conducted by Brewin and Patel (2010). The authors used item 27 of the DES, which asks about experiences of voice-hearing as the measure of hallucinations in their correlational analysis, while using the rest of the DES as their measure of dissociation. The use of the same measure to quantify these two distinct variables could lead to biased results. Other methodological issues for research on the relationship between hallucinations and dissociation in those with PTSD were also recognized such as the lack of random sample selection and not controlling for potential confounding variables (Pilton et al., 2015).

Twelve studies conducted with non-clinical participants were also identified in Pilton and colleagues' (2015) systematic review (Altman, Collins, & Mundy, 1997; Bradbury, Stirling, Cavill, & Parker, 2009; Escher, Romme, Buiks, Delespaul, & van Os, 2002a; Escher, Romme, Buiks, Delespaul, & van Os, 2002b; Glicksohn & Barrett, 2003; Glicksohn, 1991; Kilcommons, Morrison, Knight, & Lobban, 2008; Morrison & Petersen, 2003; Perona-

Garcelán et al., 2013; Perona-Garcelán et al., 2014; Varese, Barkus et al., 2011; Yoshizumi, Murase, Honjo, Kaneko, & Murakami, 2004). However, Pilton and colleagues (2015) noted that in many of these studies, the mental health histories of the non-clinical participants were not systematically assessed. Therefore, how 'clean' these samples were remains unclear. Of these 12 non-clinical studies, 7 utilized a version of the DES (Altman, et al., 1997; Bradbury, et al., 2009; Escher, et al., 2002a; 2002b; Kilcommons et al., 2008; Morrison & Petersen, 2003; Yoshizumi et al., 2004), two used both the DES and Absorption Scale (Glicksohn & Barrett, 2003; Glicksohn, 1991), two used the Cambridge Depersonalization Scale (CDS) and Tellegen Absorption Scale (TAS) (Perona-Garcelán et al., 2013; Perona-Garcelán et al., 2014), and one study utilized the Five Factors Mindfulness Questionnaire (Varese, Barkus et al., 2011). In terms of the measurement of hallucinations, 5 studies utilized the LSHS-R (Bradbury, et al., 2009; Glicksohn, 1991; Perona-Garcelán et al., 2013; Perona-Garcelán et al., 2014; Varese, Barkus et al., 2011), one used the LSHS-R and the Barrett Hallucination Questionnaire (BHS) (Glicksohn & Barrett, 2003), two studies utilized the Maastricht Voices Interview for Children (MVI-C) (Escher et al., 2002a; 2002b), one study utilized the Diagnostic Inventory Schedule-Psychotic Symptom List (DIS) (Altman, et al., 1997), one study used the Revised Hallucination Scale (RHS), Psychotic Symptoms Rating Scale (PSYRATS) and Auditory Hallucination Inventory (AHI) (Kilcommons et al., 2008), another study employed both the RHS and Interpretation of Voices Inventory (IVI) (Morrison & Petersen, 2003). Finally, in one study, hallucinatory experiences were determined through a clinical interview (Yoshizumi, et al., 2004).

All 12 non-clinical studies identified in Pilton and colleagues' (2015) systematic review found a significant relationship between the measure of hallucination/hallucination-proneness and dissociation. Furthermore, several studies found that the relationship between hallucinations remained significant even after controlling for the effects of potential

confounding variables such as schizotypal ideation and depression (Altman et al., 1997), age, gender, educational variables and participation motivation (Glicksohn et al., 1999), age, gender and modality of hallucinations (Yoshizumi et al., 2004) metacognitive beliefs (Morrison & Petersen, 2003; Perona-Garcelán et al., 2013) and paranoia (Varese Udachina et al., 2011).

The two studies conducted by Escher and colleagues (2002a; 2002b), were the only studies to employ a longitudinal design. They found in a group of 80 young people who experienced auditory hallucinations, that greater scores on the DES were associated with an elevated likelihood of persistent auditory hallucinations (Escher et al., 2002a). A major limitation of studies with non-clinical participants is that the primary measure of hallucinations used is one of hallucination-proneness. Whether findings from measures of hallucination-proneness and subclinical hallucinations can be adequately generalized to groups with clinically significant hallucinations remains unclear.

The three studies of those with DID (Dorahy et al., 2009; Honig et al., 1998; Laddis & Dell, 2012) described in Pilton and colleagues' (2015) systematic review did not directly test for associations between hallucinations and dissociation. Rather, these studies investigated phenomenological differences in the experience of hallucinations in those with dissociative and psychotic disorders. Pilton and colleagues (2015) argued that tentative evidence regarding the relationship between hallucinations and dissociation could be inferred from comparing the characteristics of hallucinations in those considered to be highly dissociative (e.g., people with DID) and other diagnostic groups with hallucinatory experiences (e.g., people with schizophrenia).

Dorahy and colleagues (2009) compared various aspects of auditory hallucinations as measured by the Mental Health Research Institute Unusual Perceptions Schedule (MUPS) between those with DID ($n = 29$) and those with schizophrenia and a history of childhood trauma ($n = 16$) and those without childhood trauma ($n = 18$). They found that participants with

DID appeared to have higher percentage of voices that started before 18 years of age, two or more voices, both child and adult voices, and experiences of visual, tactile and olfactory hallucinations, compared with both the schizophrenia with a history of maltreatment and without maltreatment groups (Dorahy et al., 2009). Dorahy and colleagues (2009) also demonstrated that when compared to participants with schizophrenia, those with DID experienced more premonitory signs at the onset of auditory hallucinations, more physical sensations, more tactile and visual hallucinations, more male and female voices, more voices talking in relation to them, and/or talking with no self-reference and/or voices commenting on behavior. The same study further found that 70% of participants with DID reported that they would miss the voices compared with only 20% of the schizophrenia group stating the same (Dorahy et al., 2009). Dorahy and colleagues (2009) also found that pathological dissociation as measured by scores on the DES-T, regardless of diagnosis, increased the likelihood of experiencing more than 2 voices, experiencing command hallucinations and feeling controlled by the voices and experiencing voice content consistent with past memories and influential people. However, the authors note that these findings require further replication.

Laddis and Dell (2012) compared scores on the Multidimensional Inventory of Dissociation (MID) between those with DID ($n = 40$) and those with schizophrenia ($n = 40$). Similarly, to Dorahy and colleagues (2009) they also found that participants with DID had higher rates of voices that started before 18 years of age, two or more voices, both child and adult voices, and experiences of visual, tactile and olfactory hallucinations, compared to those with schizophrenia. In contrast to Dorahy et al., (2009) and Laddis and Dell (2012), Honig and colleagues' (1998) study found no significant differences in the phenomenological experience of voice-hearing as measured by a semi-structured clinical interview developed by the authors in those with dissociative disorders ($n = 15$) compared with schizophrenia ($n = 18$). The lack of significant differences demonstrated in Honig and colleagues' (1998) study may be due to

the small sample size and lack of observed statistical power. Additionally, all three of these studies utilized different measures to assess the characteristics of auditory hallucinations making comparisons between studies difficult.

Despite these reported discrepancies in the phenomenological characteristics of auditory hallucinations experienced by those with DID and schizophrenia, there are also crucial similarities. These similarities affect how hallucinatory experiences, especially voices are considered when differentiating between these two diagnostic groups. The commonalities relate to the location of auditory hallucinations. It has been suggested that when compared to people with schizophrenia, those with dissociative disorders, especially DID, experience more internally generated voices compared with externally generated ones and that the presence of internally generated voices is a reliable way of separating those with DID from those with schizophrenia (Steinberg, 1995; van der Zwaard & Polak, 2001). However, Dorahy et al., (2009) found that past and present auditory hallucinations were more likely to be perceived as coming from an internal source for both those with DID and schizophrenia. Furthermore, external auditory hallucinations were uncommon in those with schizophrenia (Dorahy et al., 2009). With regards to the locale of auditory hallucinations, those with DID and schizophrenia appear to be more alike than different (Dorahy et al., 2009; Honig et al., 1998). The similarities and differences in hallucinatory symptoms between psychotic (i.e., schizophrenia-spectrum) and dissociative disorders (i.e., DID) have potential implications for the differential diagnosis of these two conditions. The co-occurrence of psychotic and dissociative disorders will be further discussed in Section 4.5 of this chapter.

In addition to studies that investigated the relationship between dissociation and hallucinations, at the time of publication, Pilton and colleagues (2015) identified three studies that investigated the potential mediating effect of dissociation on the relationship between childhood trauma and psychosis (Perona-Garcelán, Carrascoso-López et al., 2012; Perona-

Garcelán et al., 2014; Varese, Barkus et al., 2012). Varese, Barkus et al., (2012) found that dissociation significantly mediated the relationship between childhood trauma and hallucination-proneness (LSHS-R) in an aggregated non-clinical and psychosis group ($n = 65$) and for the psychosis group itself ($n = 45$). Additionally, Varese, Barkus and colleagues (2012) examined a cognitive mechanism proposed to underlie the relationship between dissociation and hallucinations (i.e., impaired reality testing). They used a signal detection task to examine the relationship between reality discrimination and hallucination-proneness (Varese, Barkus et al., 2012). The results indicated that impairment in reality discrimination was associated with vulnerability to hallucination-proneness and not dissociation (Varese, Barkus, et al., 2012). Perona-Garcelán, Carrascoso-López and colleagues (2012) studied a sample of 71 participants with a schizophrenia-spectrum disorder and found that dissociation, as measured by the total DES score mediated the relationship between childhood trauma and hallucinations (i.e., score on the hallucinations subscale of the PANSS). Furthermore, when the subscales of the DES were entered into a multiple mediation model, only the depersonalization subscale of the DES demonstrated a significant mediating effect on the relationship between childhood trauma and hallucinations (Perona-Garcelán, Carrascoso-López et al., 2012). In a subsequent study conducted by Perona-Garcelán et al., (2014) both depersonalization, as measured by the CDS and absorption, measured on the TAS, mediated the relationship between childhood trauma and hallucination-proneness in a sample of non-clinical university students. A common limitation of these mediational studies is the inability to provide evidence of causality due to the use of a cross-sectional research design. The relationship between depersonalization and hallucinations as well as the psychological processes associated with this relationship will be further discussed in Section 4.3.1.

Following the systematic review, Pilton and colleagues (2015) conducted a meta-analysis of 19 studies which quantitatively examined the relationship between dissociation and

hallucinations and/or hallucination-proneness using validated measures and also met other inclusion criteria. A large, significant, positive effect ($r = .52$) was found between dissociation and hallucinatory experiences (Pilton et al., 2015). However, a number of limitations of the meta-analysis were noted, including the small number of studies included, the inability to analyze clinical, non-clinical, child, adolescent adult studies separately in the meta-analysis and the inability to separate out hallucinations into specific modalities. For example, ratings on the PANSS hallucinations subscale also reflect visual hallucinations as do scores on the LSHS-R.

Despite these limitations, the overall results of the systematic literature review and meta-analysis conducted by Pilton and colleagues (2015) suggests that dissociative experiences have a robust relationship with hallucinations and that dissociation may be a putative mediating factor on the relationship between childhood trauma and hallucinations (Pilton et al., 2015).

The authors made several key recommendations for future research. Firstly, underlying cognitive and psychological mechanisms that are potentially shared between dissociation and hallucinations should be investigated. Secondly, to further enhance our understanding of the association between dissociation and hallucinations, Pilton and colleagues (2015) recommended adopting an alternative conceptualization of dissociation from the unidimensional continuum approach and examining the specificity of the relationship between different subtypes of dissociation (i.e., compartmentalization and detachment) and hallucinations. How hallucinations might relate to experiences of compartmentalization and detachment will be discussed in Section 4.3.1 of this thesis.

Since the publication of Pilton and colleagues' (2015) systematic review and meta-analysis, there have been several additional studies which have investigated the relationship hallucinatory experiences and dissociation using larger samples sizes, more sophisticated methodological approaches and examining the proposed effects of psychological mechanisms

putatively associated with the relationship such as insecure attachment and maladaptive schemas (Bortolon, Seille & Raffard, 2017; Berry, Fleming, Wong & Bucci, 2018; Cole, et al., 2016; Gomez & Freyd, 2017; Longden et al., 2016; Pearce et al., 2017; Yamasaki et al., 2016). The majority of these studies recruited a non-clinical sample (Bortolon et al., 2017; Berry et al., 2018; Cole, et al., 2016; Gomez & Freyd, 2017; Yamasaki et al., 2016), one study utilized a FEP sample (Longden et al., 2016) and one study recruited a sample of participants who had either self-reported as receiving a diagnosis of schizophrenia or other related psychotic disorders or had sought mental health or medical assistance for distressing psychotic experiences (Pearce et al., 2017). Three studies reported significant, positive correlations between dissociation as measured by a variant of the DES and hallucination-proneness (scores on LSHS) (Berry et al., 2018; Cole, et al., 2016) and items measuring hallucinations as measured by the 'hearing voices' items of the Community Assessment of Psychotic Experiences (CAPE) (Pearce, et al., 2017).

One of these recent studies recruited a sample of 67 FEP participants and examined the relationship between dissociation and non-auditory hallucinations specifically (Longden et al., 2016). The authors found that those with non-auditory hallucinations had significantly higher scores on the DES-II when compared to those with FEP and no history of hallucinations. Furthermore, dissociation was the only predictor of non-auditory hallucinations even after adjusting for the effects of childhood trauma and emotional distress (Longden et al., 2016).

Four of these recent studies employed a mediational design (Cole, et al., 2016; Gomez & Freyd, 2017; Pearce et al., 2017; Yamasaki et al., 2016). Cole and colleagues (2016) studied a sample of 200 non-clinical participants and found that dissociation as measured by the DES, mediated the relationship between childhood trauma and hallucination-proneness. Furthermore, Cole and colleagues (2016) investigated whether the relationship between childhood trauma and hallucination-proneness was mediated by specific types of dissociative

experiences (i.e., absorption, amnesia and depersonalization subscales of the DES and scores on the CDS) they found that absorption was the only significant mediator in the mediation model. In a sample of 192 non-clinical participants, Gomez and Freyd (2017) examined whether experiences of dissociation, as rated on The Curious Experiences Survey, mediated the relationship between high betrayal child sexual abuse (scores on the Sexual Experiences Survey) and hallucinations as measured on the Beliefs and Experiences Module of the Composite International Diagnostic Interview. They found a significant indirect effect of dissociation on the relationship between early sexual abuse by a 'trusted' perpetrator and hallucinatory experiences. Dissociation was also found to mediate the relationship between peer victimization, as measured by selected items on the Olewus Bully/Victims Questionnaire and hallucinatory experiences in a sample of 4277 early adolescents (Yamasaki et al., 2016). In Yamasaki and colleagues' (2016) study, parent ratings on the auditory and visual hallucination items of the Child Behavior Check List (CBCL) were used to index hallucinatory experiences and items such as 'acts too young for his/her age', 'can't concentrate/pay attention for too long', 'confused or seems to be in a fog', 'daydreams', 'stares blankly', 'sudden mood changes' from the CBCL were used to capture dissociation (Yamasaki et al., 2016). However, the 'dissociative' items of the CBCL used in Yamasaki et al.'s (2016) study are somewhat vague and broad, therefore, how well they represent clinically significant dissociation needs further evaluation.

Another recent development in this area of research is the increase in studies that have directly tested models for the relationship between childhood trauma, dissociation, hallucinations and associated psychological factors (Bortolon et al., 2017; Berry et al., 2018; Pearce et al., 2017). At present, key models relating to insecure attachment (Berry et al., 2018; Pearce et al., 2017) and maladaptive schemas have been studied (Bortolon et al., 2017). To account for the associations between childhood trauma, insecure attachment, dissociation and

auditory hallucinations, the Cognitive Attachment model of Voices (CAV) was proposed (Berry & Bucci, 2016; Berry, Varese & Bucci, 2017). This model suggests that experiences of childhood trauma disrupt the normal attachment systems as well as producing dissociative states in response to stress leaving the affected person vulnerable to hallucinatory experiences (Berry & Bucci, 2016; Berry, Varese & Bucci, 2017).

The combined effect of insecure attachment and dissociation on the relationship between childhood trauma and hallucinatory experiences have been in investigated in two studies (Berry et al., 2018; Pearce et al., 2017). Berry et al., (2018) found in a non-clinical sample that insecure attachment styles as measured by the Relationship Scales Questionnaire (RSQ) demonstrated positive correlations with childhood adverse experiences (CTQ), dissociative symptoms (DES-II) and hallucinations proneness (LSHS-R). All three psychological factors (i.e., insecure attachment, dissociation and childhood trauma) predicted hallucination-proneness. However, only dissociation and avoidant attachment style were independent predictors of hallucination-proneness in the final model (Berry et al., 2018). An additional study of those with self-reported psychotic experiences and disorders, positive associations were found between fearful (but not dismissive and anxious) attachment as measured by the Relationship Questionnaire (RQ), dissociation (DES-Revised), childhood trauma (Brief Betrayal Trauma Survey) and voices (measured by the 'hearing voices' items of the Community Assessment of Psychotic Experiences) (Pearce, et al., 2017). However, only dissociation and not fearful attachment mediated the relationship between childhood trauma and hallucinations (Pearce et al., 2017). These studies provide some evidence for the role of insecure attachment and dissociation on hallucinations in the context of childhood trauma. However, the precise role of insecure attachment styles as well as the CAV model requires further empirical validation.

As previously mentioned, another recently investigated model of the relationship

between childhood trauma, dissociation, hallucinations and associated psychological features involves the role of maladaptive schemas. Schemas are stable, organized mental representations of a person's memories, thoughts, emotions and somatic sensations. These representations are believed to impact on the person's ongoing perception, cognition and behavior (Young, Klosko & Weishaar, 2003). Experiences of early trauma can lead to the formation of negative and maladaptive schemas of the self, which can impact on hallucinatory experiences (e.g., Garety, Kuipers, Fowler, Freeman & Bebbington, 2001). In the general populous, maladaptive schemas were found to mediate the relationship between emotional neglect and dissociative symptoms (Wright, Crawford & Del Castillo, 2009). Bortolon and colleagues (2017) utilized partial least square structural equation modeling to explore the association between the key variables of childhood trauma, dissociation, maladaptive schemas and hallucinations. It was found that in a non-clinical sample, experiences of sexual abuse and emotional abuse had an impact on hallucination-proneness (LSHS-R) through the effect of dissociation (DES) and maladaptive schemas as measured by the Young Schema Questionnaire-Short Form. However, physical abuse affected hallucination-proneness via dissociative experiences only (Bortolon, et al., 2017). The same study showed that the four negative self-schemas which had the highest impact on hallucination-proneness were abandonment, vulnerability, self-sacrifice and subjugation (Bortolon et al., 2017).

While these studies (Bortolon et al., 2017; Berry et al., 2018; Pearce et al., 2017) provide us with a more detailed and improved understanding of the psychological factors involved in the association between childhood trauma, dissociation and hallucinations they require and warrant additional validation and replication.

Overall, the current research literature suggests that there is a strong link between dissociative experiences and hallucinations both in those with psychosis and the general population (e.g., Pilton et al., 2015). Furthermore, there is growing evidence that suggests that

dissociation mediates the relationship between childhood trauma and hallucinatory experiences (e.g., Cole et al., 2016; Perona-Garcelán, Carrascoso-López et al., 2012; Varese, Barkus et al., 2012). However, there is a scarcity of studies which have investigated the relationship between childhood trauma, dissociation and hallucinations in a sample of FEP. In the extant research only one study (Longden et al., 2016) has specifically examined the relationship between dissociation and hallucinations in a FEP group and none have tested the indirect effect of dissociation on the relationship between childhood trauma and hallucinations.

4.2.2 Dissociation and Delusional Ideation

When compared with the relationship between dissociation and hallucinations, the relationship between dissociation and delusions is less examined and the findings are more mixed. Studies that have examined the relationship between dissociation and delusions and reviewed by the author for this thesis are presented in Table 4.1 on the following page.

Table 4.1

Studies examining the relationship between delusions and dissociation

Author (date)	Design	Sample type, diagnosis	Total N, group n	Measure/s			Main (relevant) findings
				Delusions	**Dissociation**	**Other**	
Altman et al., (1997)	Between groups	Non-clinical, adolescents	N = 38 Delusions = 9 No delusions = 29	DIS (psychotic symptoms module)	DES	PPVT RISC CDI	• No significant differences in DES scores between those with delusions and no delusions.
Bradbury et al., (2009)	Correlational	Non-clinical	N = 131	PDI	DES	LSHS-R RGY RTS SPQ-B SOC RPBS TRB	• Significant correlation between delusions (PDI) and dissociation (DES).
Černis et al., (2014)	Correlational	Clinical, schizophrenia with persecutory delusions	N = 50	PSYRATS (delusions)	CDS	PANSS-H GPTS PSWQ BAI PTQ WASI	• 30 out of 50 participants reported 10 or more symptoms of depersonalization frequently in the last 6 months. • Significant correlations between CDS total score and delusions. • Significant correlations between subscales of CDS and delusions.
Cole et al., (2016)	Mediation, correlational	Non-clinical	N = 200	PDI	DES-II CDS	LSHS-R CATS	• Significant correlation between delusions and total DES-II score. • The relationship between childhood trauma and delusions was significantly mediated by

Author (date)	Design	Sample type, diagnosis	Total N, group n	Measure/s			Main (relevant) findings
				Delusions	**Dissociation**	**Other**	
Doğan et al., (2017)	Correlational	Clinical, schizophrenia	N = 48	SAPS	SDQ	SANS CGI BABS	absorption (positive direction) and amnesia (negative direction). Delusions significantly correlated with 6 SDQ items.
Escher et al., (2002b)	Regression	Non-clinical, voice-hearing children and adolescents	N = 80	BPRS	DES	MVI-C CGAS YSR	Dissociation did not significantly predict delusions.
Goff et al., (1991a)	Between groups	Clinical, chronic psychosis	N = 61 History of childhood abuse = 27 No abuse = 34	BPRS	DES	LEQ SCID-D SCID TRS	No significant differences in the severity of delusions between those with a history of childhood trauma and those without.
Goff et al., (1991b)	Between groups	Clinical, chronic psychosis	N = 61 Delusions of possession = 25 No delusions = 36	BPRS SCID-D (experiences of possession)	DES	SCID TRS LEQ	- The group with delusions of possession experienced higher dissociation (DES) than no delusions. - Those with delusions reported significantly greater experiences of sexual abuse and hallucinations inside the head compared with no delusions.

Author (date)	Design	Sample type, diagnosis	Total N, group n	Measure/s			Main (relevant) findings
				Delusions	**Dissociation**	**Other**	
Kilcommons & Morrison (2005)	Correlational	Clinical, schizophrenia	N = 32	PANSS	DES	PTCI PSS	• No significant correlation between DES total score and delusions and no significant correlations between the DES subscales and delusions. • No relationship PTCI and delusions. • Trauma significantly correlated with delusions.
Kilcommons et al., (2008)	Regression, correlational	Non-clinical, survivors of sexual assault	N = 40	PDI	DES	RHS PSYRATS (AHRS, VHRS) AHI PTCI SEQ2 DTS	• Significant correlation between all subscales of the PDI and DES total score. • Scores on the DES and PTCI predicted delusional distress (PDI).
Laddis & Dell (2012)	Between groups, correlational	Clinical, schizophrenia, dissociative identity disorder (DID)	N = 80 DID = 40 Schizophrenia = 40	MID (Psychosis Screen) (delusional beliefs)	MID	TEQ SCID-D-R SCID	• Significant correlations between MID items and delusions. • Those with schizophrenia reported more delusional items on the MID compared to those with DID.
Lysaker & LaRocco (2008)	Correlational	Clinical, schizophrenia	N = 68	PANSS	TSI (dissociation subscale)	TAA-BRV	• Significant correlations found between delusions and dissociation.
Maggini et al., (2002)	Between groups,	Clinical, schizophrenia	N = 57	SAPS	WNDD	BSABS SANS	• The 'depersonalized' group reported significantly higher

Author (date)	Design	Sample type, diagnosis	Total N, group n	Measure/s			Main (relevant) findings
				Delusions	**Dissociation**	**Other**	
	correlational					ToAS CaDS	delusions than 'non-depersonalized' group. • Delusions significantly correlated with the WNDD.
Pearce et al., (2017)	Mediation, correlational	Clinical, self-report receiving treatment for psychosis	N = 112	CAPE (paranoia subscale)	DES-R	BBTS CAPE (hallucination items) RQ	• Significant correlation between paranoia and dissociation. • Both fearful attachment and dissociation significantly mediated the relationship between trauma and paranoia.
Perona-Garcelán et al., (2010)	Between groups	Clinical, schizophrenia	N = 37 DES-II ≥ 25 = 8 DES-II < 25 = 29	PANSS	DES-II	TQ	• Group with delusions had higher mean scores on the DES-II than those with no delusions. • Those with high dissociation (DES-II ≥ 25) did not have more delusions than those with low dissociation (DES-II < 25).
Perona-Garcelán et al., (2011)	Correlational	Clinical, schizophrenia	N = 59	PANSS	CDS	SCS-R	• Significant correlation between scores on the CDS and PANSS delusions subscale
Perona-Garcelán, Carrascoso-López et al., (2012)	Mediation, Correlational,	Clinical, schizophrenia	N = 71	PANSS	DES	TQ	• Significant correlation between delusions and total DES-II, absorption and depersonalization subscales. • Relationship between childhood trauma and delusions not mediated by dissociation.

Author (date)	Design	Sample type, diagnosis	Total N, group n	Measure/s			Main (relevant) findings
				Delusions	**Dissociation**	**Other**	
Perona-Garcelán, García-Montes et al., (2012)	Between groups	Clinical, schizophrenia	N = 124 SwHall&Del = 27 SnHalll&Del = 20 Srec = 28 CC = 22 NCC =27	PANSS	TAS CDS	MCQ-30	• The hallucinations and delusions group scored significantly higher on the CDS than all other groups including the delusions only groups. • The group with hallucinations and delusions scored higher on the TAS compared to all other groups except the clinical control group.
Spitzer et al., (1997)	Correlational	Clinical, schizophrenia	27	PANSS	DES FDS	SCL-90-R MWT	• Delusions significantly correlated with total scores on the DES and the FDS (German version of the DES). • Delusions significantly correlated with the absorption subscale of the DES and the conversion items included in the FDS.

Abbreviations: SwHall&Del = schizophrenia with hallucinations and delusions, SnHalll&Del = schizophrenia no hallucinations and delusions, Srec = schizophrenia recovered, CC = clinical control, NCC = non-clinical control

Measures of dissociation: Trauma Symptoms Inventory = TSI, Wernickian Nomothetic Depersonalizative Descriptor = WNDD, Cambridge Depersonalization Scale = CDS, Tellegen Absorption Scale = TAS, Multidimensional Inventory of Dissociation = MID, Structured Clinical Interview for DSM-III-R- Dissociative Disorders = SCID-D, Structured Clinical Interview for DSM-IV-TR- Dissociative Disorders = SCID-D-R, Somatoform Dissociation Questionnaire = SDQ

Measures of psychosis: Positive and Negative Syndrome Scale = PANSS, Brief Psychiatric Rating Scale = BPRS, Psychotic Symptoms Rating Scales = PSYRATS, Scale for the Assessment of Positive Symptoms = SAPS, Scale for the Assessment of Negative Symptoms = SANS, Peters et al. Delusion Inventory = PDI, Launay-Slade Hallucinations Scale –Revised = LSHS-R, Community Assessment of Psychotic Experiences = CAPE, Diagnostic Inventory Schedule = DIS Revised Hallucination Scale = RHS, Auditory Hallucinations Subscale = AHRS, Visual Hallucinations Subscale = VHRS, Auditory Hallucination Interview = AHI, Maastricht Voices Inventory for Children = MVI-C

Other measures: Youth Self Report = YSR, Children's Global Assessment Scale = CGAS, Posttraumatic Cognitions Inventory = PTCI, Green's et al., Paranoid thoughts Scale = GPTS, Penn State Worry Questionnaire = PSWQ, Beck Anxiety Inventory = BAI, Perseverative Thinking Questionnaire = PTQ, Wechsler Abbreviated Scale of Intelligence = WASI, Bonn Scale for the Assessment of Basic Symptoms = BSABS, Calgary Depression Scale = CaDS, Toronto Alexithymia Scale = ToAS, Symptoms Checklist 90 Revised = SCL-90-R, Multiple-choice Vocabulary Intelligence Test = MWT, Metacognitions questionnaire = MCQ-30, Revised self-consciousness scale = SCS-R, Relationship Questionnaire = RQ, Treatment Response Scale = TRS, Structured Clinical Interview for DSM-IV = SCID, Religiosity = RGY, Revised Transliminality Scale = RTS, Schizotypy Personality Questionnaire-Brief = SPQ-B, Sense of coherence = SOC, Revised Paranormal Belief Scale = RPBS, Traditional Religious Beliefs = TRB, Peabody Picture Vocabulary Test –Revised = PPVT-R, Rust Inventory of Schizotypal Thinking = RISC, Children's Depression Inventory = CDI, Clinical Global Inventory = CGI, Brown Assessment of Beliefs Scale = BABS

Of the 19 studies that have examined the relationship between dissociation and delusional ideation (see Table 4.1), 14 utilized clinical samples: eleven studies involved those diagnosed with a psychotic disorder (Doğan et al., 2017; Goff et al., 1991a; 1991b; Kilcommons & Morrison, 2005; Lysaker & LaRocco, 2008; Maggini et al., 2002; Perona-Garcelán et al., 2010; Perona-Garcelán et al., 2011; Perona-Garcelán, Carrascoso-López et al., 2012; Perona-Garcelán, García-Montes et al., 2012; Spitzer et al., 1997), one study was of those with self-reported psychotic symptoms or disorder (Pearce et al., 2017), one study recruited those with persecutory delusions only (Černis et al., 2014) and another study compared those with schizophrenia and DID (Laddis & Dell, 2012). To measure dissociation in these 19 studies, the majority (12 studies) used a variation of the DES (Altman et al., 1997; Bradbury et al., 2009; Escher et al., 2002b; Goff et al., 1991a; 1991b; Kilcommons & Morrison, 2005; Kilcommons et al., 2008; Pearce et al., 2017; Perona-Garcelán et al., 2010; Perona-Garcelán, Carrascoso-López et al., 2012; Spitzer et al., 1997) or both the DES and CDS (Cole et al., 2016). One study utilized the CDS (Černis et al., 2014), and both the CDS and TAS were used in another study (Perona-Garcelán, García-Montes et al., 2012). One study used the dissociation subscale of the TSI (Lysaker & LaRocco, 2008), one study employed the MID (Laddis & Dell, 2012) and another study used the Wernickian Nomothetic Depersonalizative Descriptor (WNDD) to measure dissociative experiences (Maggini et al., 2002).

In the 19 studies reviewed, the most commonly used measure of delusions was the delusions subscale of the PANSS, which was used in seven studies (Kilcommons & Morrison, 2005; Lysaker & LaRocco, 2008; Perona-Garcelán et al., 2010; Perona-Garcelán et al., 2011; Perona-Garcelán, Carrascoso-López et al., 2012; Perona-Garcelán, García-Montes et al., 2012; Spitzer et al., 1997). In addition, three studies used the Brief Psychiatric Rating Scale (BPRS) (Escher et al., 2002b; Goff et al., 1991a; 1991b), three studies used the Peters et al. Delusion Inventory (PDI) (Bradbury et al., 2009; Cole et al., 2016; Kilcommons et al., 2008), two studies

utilized the SAPS (Doğan et al., 2017; Maggini et al., 2002), one study used the psychosis screen of the MID (Laddis & Dell, 2012), another used the delusions subscale of the PSYRATS (Černis et al., 2014). The psychotic symptoms module of the DIS (Altman et al., 1997) and paranoia items of the Community Assessment of Psychotic Experiences (CAPE) (Pearce et al., 2017) have also been used to measure delusional experiences in these studies examining the relationship between delusions and dissociation.

In those with psychosis, several studies demonstrated that delusions were significantly correlated with scores on the DES (Pearce et al., 2017; Perona-Garcelán et al., 2012a; Spitzer et al., 1997), the dissociation subscale of the TSI (Lysaker & LaRocco, 2008) the MID (Laddis & Dell, 2012), the CDS (Černis et al., 2014; Perona-Garcelán et al., 2011) and the Somatoform Dissociation Questionnaire (SDQ) (Doğan et al., 2017). By contrast, Kilcommons and Morrison (2005) found no relationship between the DES and the delusions subscale of the PANSS. However, the authors acknowledged that the small sample size may have affected the lack of findings. In non-clinical samples, several studies found significant correlations between the PDI and the DES (Bradbury et al., 2009; Kilcommons et al., 2008; Cole et al., 2016).

When employing more sophisticated methodologies, Kilcommons and colleagues (2008) studied a group of 40 sexual assault survivors and found that both dissociation (scores on the DES) and scores on the Posttraumatic Cognitions Inventory (PTCI) predicted delusional distress when using the PDI. By contrast, in a longitudinal study of voice-hearing children and adolescents, dissociation did not predict the development of delusions over a three-year follow-up (Escher et al., 2002b). However, there were several limitations to this study which were acknowledged by the authors. For example, the age of the participants ranged from 8 years to 19 years and therefore, the distribution of developmental stages for the participants was rather wide. Thus, the group could be considered heterogeneous and this would affect the generalizability of findings. Furthermore, the researchers questioned the younger children's

cognitive capacity to complete the assessment measures accurately. Although the researchers also conducted the analyses on a group consisting of only the older children (over 13 years of age), the sample size of this older group was small ($n = 33$) (Escher et al., 2002b).

Several studies have also adopted between-groups design to examine the relationship between dissociation and delusions (e.g., Goff, 1991a; 1991b; Laddis & Dell, 2012; Maggini et al., 2002; Perona-Garcelán et al., 2010; Perona-Garcelán, García-Montes et al., 2012). In those with psychosis, one study conducted by Goff and colleagues (1991b) found that those who experience delusions featuring possession by an external force, reported higher scores on the DES compared to those without such delusions. In another study, of 57 participants diagnosed with schizophrenia, Maggini and colleagues (2002) study showed that a 'depersonalized' group, determined by criteria set by the WNDD, scored significantly higher on the delusions subscale of the PANSS compared to a group who were not depersonalized. One study compared those with DID and schizophrenia (Laddis & Dell, 2012) and found that correlation coefficients between items on the MID and delusions as measured by the psychosis screen, were significantly higher in those with schizophrenia compared to those diagnosed with DID.

In a number of studies that have compared the relationship between dissociation and delusions and dissociation and hallucinations, a closer relationship between hallucinations and dissociation was suggested (Altman et al., 1997; Kilcommons & Morrison, 2005; Perona-Garcelán, Carrascoso-López et al., 2012; Perona-Garcelán et al., 2011). For example, in a group of 37 people with schizophrenia-spectrum disorder, Perona-Garcelán and colleagues (2010) found that those with delusions had higher scores on the DES when compared to a group with no delusions. However, the same study also demonstrated that those with the severest levels of dissociation (DES score ≥ 25) when compared with those with low dissociation (DES score < 25), had severer hallucinations but not delusions (Perona-Garcelàn et al., 2010).

Similarly, Perona-Garcelàn and colleagues (2011) found that those with schizophrenia and hallucinations scored significantly higher on the TAS and the CDS compared to those with delusions only. Goff and colleagues (1991a), compared scores on the DES, the hallucinations and delusions subscales of the BPRS for those with a history of abuse and those without. They found that when those with a history of trauma were compared to those without such a history, those with trauma demonstrated significantly more dissociative and hallucinatory experiences but not delusions (Goff et al., 1991a).

Similar between-groups findings for hallucinations and delusions were also demonstrated in a non-clinical study. In one study of 38 non-clinical adolescents, scores on the DES were not significantly different between those with delusional experiences as measured on the psychotic module of the Diagnostic Inventory Schedule (DIS), compared to those without delusions (Altman et al., 1997). However, there were significant differences in scores on the DES between those with hallucinations and those without hallucinatory experiences (Altman et al., 1997). A closer relationship between dissociation and hallucinations was also demonstrated in a mediation study (Perona-Garcelán, Carrascoso-López et al., 2012). Perona-Garcelán, Carrascoso-López and colleagues (2012) investigated whether dissociation (i.e., total DES score) mediated the relationship between childhood trauma and hallucinations and childhood trauma and delusions in a group of 71 participants with psychosis. They found that while dissociation was significantly correlated with delusions, only the relationship between childhood trauma and hallucinations was mediated by dissociation.

However, results from more recent mediation studies have found a significant indirect effect of dissociation on the relationship between childhood trauma and delusions as well as hallucinations in a non-clinical sample (Cole et al., 2016). Furthermore, both fearful attachment and dissociation mediated the relationship between early trauma exposure and delusions in a group with self-reported psychotic symptoms or disorders (Pearce et al., 2017). Cole and

colleagues (2016) conducted mediational analysis on 200 non-clinical participants and found that absorption positively mediated the relationship between childhood trauma and delusions (as measured on the PDI), while experiences of dissociative amnesia negatively mediated the relationship. This unusual finding suggests that severer experiences of childhood trauma are associated with less delusional ideation, as mediated by dissociative amnesia. A proposed explanation for the negative mediation was that experiences of dissociative amnesia may result in a lack of access to traumatic memories, thus reducing symptoms such as delusional ideation (Cole et al., 2016). In a sample of 112 with self-reported psychosis, Pearce and colleagues (2017) found that fearful attachment as measured on the RQ, in conjunction with dissociation (DES-R) mediated the relationship between early trauma exposure (Brief Betrayal Trauma Survey) and paranoia items of the CAPE. Results from these mediation studies require additional empirical validation and replication.

Overall, the evidence pertaining to the relationship between delusions and dissociative experiences is more inconsistent when compared to research for hallucinations and dissociation. However, results from recent mediation studies suggest that that dissociation is still a relevant factor in the formation of delusions, especially in the context of early trauma. Therefore, this relationship warrants further investigation.

An additional critique of the current research is that the majority of studies have considered delusions as a single, homogeneous entity. However, those with psychosis can experience different types of delusional ideation such as grandiose, bizarre or persecutory delusions, as well as delusions of reference. These different types of delusions are likely associated with distinct underlying processes. For instance, it has been proposed that for those with a history of trauma, persecutory delusions may arise from insecure attachment leading to paranoia and mistrust of others (e.g., Bentall et al., 2014). On the other hand, delusions of control and certain bizarre delusions such as thought withdrawal or insertion may be associated

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with feelings of unreality and anomalous experiences relating to the self and body (Moskowitz, et al., 2009). Given the potential differences in the underlying psychological processes of delusions, future research might benefit from examining how different types of delusional ideation are related to dissociative and other trauma-related experiences.

As with research on the relationship between hallucinations and dissociation, there is a scarcity of studies which have used an FEP sample to examine the relationship between dissociation and delusions. None have tested whether dissociation mediates the relationship between childhood trauma and delusions in early psychosis.

4.3 The Bipartite Model of Dissociation and Psychotic Symptomatology

As discussed in Chapter 3 of this thesis, the conception of dissociation is shifting from a unidimensional construct to a one consisting of two distinct types of dissociative processes, namely compartmentalization and detachment (i.e., the bipartite model). In consideration of this changing conceptualization, several proposed theories suggest how hallucinations and delusions might be related to the two types of dissociation (Longden et al., 2012; Moskowitz & Corstens, 2007; Moskowitz, Read, Farrelly, Rudegair & Williams 2009). At present, there is limited empirical investigation that has directly tested how compartmentalization and detachment dissociation relate to hallucinations and delusions. However, existing research such as those which have examined the relationship between the subscales of the DES (i.e., amnesia, depersonalization/derealization and absorption) and hallucinations and delusions can be used to provide some preliminary evidence for how hallucinations and delusions might be related to compartmentalization and detachment dissociation. A better understanding of whether hallucinations and delusions are associated with particular types of dissociative experiences has pertinent implications for clinical treatment and could lead to more targeted and effective

interventions. The theories and evidence pertaining to the bipartite model and hallucinations and delusions will be reviewed in Sections 4.3.1 and 4.3.2 below.

4.3.1 The Bipartite Model and Hallucinations

In terms of the dissociative nature of auditory hallucinations, it was proposed that auditory hallucinations may be the product of inner thoughts and speech that are experienced as split-off and/or unrecognized components of the individual's personality intruding into conscious awareness (Longden et al., 2012; Moskowitz & Corstens, 2007; Moskowitz et al., 2009). Therefore, a 'rudimentary' form of dissociated identity is believed to underlie most auditory hallucinations, especially voices (Moskowitz et al., 2009). Dissociated identity, which is equivalent to identity alteration described by Steinberg (1995) refers to a shift in role or identity that produces changes in behavior (Moskowitz, et al., 2009). This is akin to the notion that hallucinations may arise from dissociated mental structures (Dell, 2009a). These theoretical accounts seem to suggest that hallucinations are related to compartmentalization dissociation.

In testing the notion that auditory hallucinations may be related to 'dissociated components', numerous qualitative studies of voice-hearing in those with DID have found that voices are attributed to alter personalities (Kluft, 1987; Ross, Heber, Norton & Anderson, 1989; Ross, Miller et al., 1990). In a qualitative study of those with chronic PTSD and voice-hearing, every participant reported that for the majority of time, voices were experienced as ego-dystonic and "alien to the extent that they were endowed with the qualities of an entirely separate entity or person", these reported experiences could potentially be generated by a dissociated or unrecognized part of the self (Anketell, Dorahy & Curran, 2011).

According to Brown (2006) the cognitive disturbances associated with compartmentalization phenomena are characterized by the automatic pre-attentive retrieval of

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stored information that is incongruous with sensory data, leading to distortions in consciousness and perceptual experiences. The issues with pre-attentive selection of incongruent information appear to be linked to deficits in cognitive inhibition and these disturbances in the memory retrieval process and subsequent perceptual distortions may also underlie hallucinations (Brown, 2006; Dorahy & Green, 2008).

While these theories explain how dissociative processes might underlie auditory hallucinations they do not adequately account for hallucinations in other sensory domains. Furthermore, how compartmentalization dissociation contributes to hallucinations and whether they are the product of a dissociated identity requires empirical investigation and validation.

Preliminary evidence for how hallucinations might relate to compartmentalization and detachment can be found in studies that use the 3 subscales of the DES and/or other measures of particular types of dissociation such as the CDS, TAS or SDQ. The CDS and TAS might represent detachment dissociation and the SDQ captures compartmentalization type dissociation. Studies which have examined the relationship between hallucinations and the subscales of the DES in those with chronic schizophrenia have found significant correlations between hallucinations as measured by the PANSS, and all 3 subscales of the DES (Perona-Garcelán, Carrascoso-López et al., 2012; Spitzer et al., 1997), although one study found that only the amnesia and depersonalization subscales were significant correlated with hallucinations (Kilcommons & Morrison, 2005). Similar results are found in non-clinical samples, with several studies finding significant correlations between hallucination-proneness (i.e., scores on LSHS) and all 3 subscales of the DES (Berry et al., 2018; Cole et al., 2016; Morrison & Petersen, 2003). These correlational studies do not appear to conclusively link hallucinatory experiences with any particularly type of dissociation.

Additional correlational studies with measures of types of dissociative experiences have also been conducted. Perona-Garcelán and colleagues (2011) found that in a sample of 59

people with chronic schizophrenia, scores on the hallucinations subscale significantly correlated with the scores on the CDS. Although in another study of those with schizophrenia and persecutory delusions, hallucinations as measured by the PANSS significantly correlated with only one item of the CDS – feelings of unreality of the self (Černis et al., 2014). Maggini and colleagues (2002) utilized a sample of 57 people with schizophrenia and found significant correlations between the Wernickian Nomothetic Depersonalizative Descriptor and the hallucinations subscale of the SAPS. In another study that utilized the SAPS to measure hallucinations in a sample of 50 participants with schizophrenia, hallucinations did not correlate with any item of the SDQ. In studies with non-clinical participants, significant correlations between the CDS, TAS and LSHS-R have been reported (Perona-Garcelán et al., 2014).

Results from these correlational studies and other studies that utilize more sophisticated methodological designs suggest that depersonalization, a form of detachment dissociation might have the strongest relationship with hallucinations in those with established psychosis (Kilcommons & Morrison, 2005; Perona-Garcelán, et al., 2008; Perona-Garcelán, Carrascoso-López et al., 2012; Perona-Garcelán et al., 2013). Kilcommons and Morrison (2005) employed the depersonalization subscale of the DES as an index of 'peri-traumatic response' and found that it predicted hallucinations as measured by the PANSS, even after controlling for the effects of cumulative trauma and negative cognitions about the 'self' (measured by the PTCI) (Kilcommons & Morrison, 2005). However, whether amnesia (which is considered a form of compartmentalization) also predicted hallucinations was not further investigated in this study despite it demonstrating a significant correlation ($r = .52$) with hallucinations. Although the depersonalization subscale of the DES was found to be the only subscale that significantly predicted hallucinations in those with psychosis in a subsequent study (Perona-Garcelán et al., 2008).

In terms of the mediating effect of specific dissociative symptoms, on the relationship between early trauma exposure and hallucinations in those with psychosis, one study found that the depersonalization/derealization subscale of the DES was the only significant, positive mediator (Perona-Garcelán, Carrascoso-López et al., 2012).

In non-clinical studies, one study demonstrated that both depersonalization (as measured by the CDS) and absorption, (measured by scores on the TAS) significantly mediated the relationship between trauma and hallucination-proneness in a sample of 329 participants (Perona-Garcelán et al., 2013). However, a recent study of non-clinical participants ($n = 200$) failed to find a significant indirect effect of depersonalization as measured by the DES-II depersonalization subscale and the CDS on the relationship between childhood trauma and hallucination-proneness (Cole et al., 2016). Instead absorption was the only significant mediator between childhood trauma and hallucination-proneness as measured by the LSHS (Cole et al., 2016). These findings are consistent with Morrison & Petersen (2003) who conducted a multiple regression analysis on a non-clinical sample ($n = 64$) and found that absorption was the only type of dissociation that predicted auditory hallucinations. It could be absorption, which is considered a non-pathological form of detachment dissociation may be more common and relevant in non-clinical samples.

Perona-Garcelán and colleagues have offered several theories of how depersonalization in conjunction with other psychological variables such as self-focused attention, metacognition and mindfulness might contribute to the development of hallucinations. Furthermore, they have conducted a series of studies which selectively examine these proposed relationships (Perona-Garcelán et al., 2011; Perona-Garcelán et al., 2008; Perona-Garcelán, García-Montes et al., 2012; Perona-Garcelán et al., 2014).

Several studies by Perona-Garcelán and colleagues have focused on the relationship between depersonalization and self-focused attention in the context of hallucinations. It has

been suggested that hallucinations arise when a person's own thoughts are erroneously attributed to an external source (e.g., Bentall, 1990). Cognitive dissonance is one psychological mechanism proposed to explain the external attribution of thoughts (e.g., Morrison, Haddock & Tarrier, 1995). In accordance with this theory, if hallucinations are the product of external attribution via cognitive dissonance, then there should be a high level of self-focused attention in individual's with hallucinations as self-focused attention is considered a necessary precursor to cognitive dissonance (Perona-Garcelán et al., 2011). Self-focused attention describes an awareness of self-referent information that is generated internally, as opposed to an awareness of information that the externally generated and derived from the sensory receptors (Ingram, 1990). Several studies have shown a specific association with self-focused attention and hallucinations (e.g. Morrison and Haddock, 1997; Ensum & Morrison, 2003; Allen et al, 2005). It is further proposed that experiences of depersonalization which create a feeling of detachment from one's own private events may be a necessary process in the link between self-focused attention and hallucinations (Perona-Garcelán et al., 2011).

Perona-Garcelàn et al., (2008) found that participants with schizophrenia and current hallucinations had higher levels of self-focused attention compared with non-clinical controls. However, no statistically significant difference in self-focused attention was found between those with schizophrenia with current hallucinations, those with remitted hallucinations and those who had never experienced hallucinations. In a subsequent study, Perona-Garcelàn and colleagues (2011), found that depersonalization as measure by the CDS, mediated the relationship between self-focused attention and auditory hallucinations but not delusions. It was proposed that self-focused attention has a direct relationship with delusions, whereas self-focused attention is associated with hallucinations through experiences of depersonalization (Perona-Garcelán et al., 2011).

The relationship between experiences of depersonalization, absorption, hallucinations,

metacognitive beliefs in those with schizophrenia have also been examined (Perona-Garcelán, García-Montes et al., 2012). Perona-Garcelán, García-Montes and colleagues (2012) found that those with schizophrenia and hallucinations demonstrated significantly more dysfunctional metacognitive beliefs as measured by the Metacognitions Questionnaire (MCQ) than those with no psychiatric conditions. Although differences in dysfunctional metacognition was not significantly different between those with hallucinations and other clinical controls. Dysfunctional metacognitive beliefs were positively correlated with scores on the CDS and TAS. Furthermore, the CDS and the 'need to control thoughts' subscale of the MCQ were the best predictors of hallucination severity (Perona-Garcelán, García-Montes et al., 2012).

In a non-clinical sample, Perona-Garcelán and colleagues (2014) examined the relationship between depersonalization, absorption and mindfulness. Significant, negative correlations were found between mindfulness as measured by the Southampton Mindfulness Questionnaire (SMQ) and scores on the CDS and TAS (Perona-Garcelán et al., 2013). The authors tentatively suggest that these associations are compatible with the idea that a poor ability for mindfulness, coupled with experiences of depersonalization and absorption, leads to problems with discriminating between internal and external events (Perona-Garcelán et al., 2013)

In this series of studies, Perona-Garcelán and colleagues provide some preliminary evidence that depersonalization in conjunction with other psychological factors might play a role in the development of hallucinations. However, these studies, like most studies in the area require additional replication and validation.

Overall, there may be measurement issues associated with studies that have found a relationship between the depersonalization/derealization subscale of the DES and hallucinations. The use of the DES has been criticized as potentially conflating this relationship and the depersonalization/derealization subscale is seen as the most problematic (Schäfer et al.,

2008; Schäfer et al., 2012; Watson, 2001). The measurement issues attributed to the DES specifically and self-report measures more generally when quantifying dissociative experiences in those with psychosis will be discussed in Section 4.4 of this chapter. Given these methodological concerns, whether hallucinatory experiences are more strongly associated detachment dissociation (e.g., depersonalization) or compartmentalization is by no means established. Additionally, no studies which examined whether different types of dissociation might be related to hallucinations in early psychosis could be sourced.

4.3.2 The Bipartite Model and Delusions

It has been proposed that experiences of derealization and depersonalization (i.e., detachment) contribute to some types of delusional ideation (Moskowitz et al., 2009). According to current cognitive models, delusions can arise from anomalous experiences and culturally unacceptable interpretations of these anomalous experiences (Garety et al., 2001; Morrison, 2001). Several proponents of this cognitive model recognize that antecedent mood states, particularly anxiety play an important role in the appearance of delusional thinking (Freeman & Fowler, 2009; Freeman & Garety, 2003; Garety et al., 2005). According to the bipartite model, detachment dissociation is a hardwired response to experiences of threat and intense anxiety. Therefore, experiences of detachment could arise in this state of anxiety and provide a source of anomalous experience which are misinterpreted within a delusional framework (Garety et al., 2001; Morrison, 2001; Moskowitz et al., 2009). Moskowitz and colleagues (2009) suggest that some delusional experiences might be essentially dissociative and feelings of unreality about the body and self, may underlie delusions of control, passivity and certain bizarre delusions such as thought withdrawal or insertion (Moskowitz, et al., 2009).

Alternatively, Ross (2008) has proposed that in the context of trauma and dissociation, thought-broadcasting and delusional ideation may be the product of cognitive errors and/or

'magical' thinking from a dissociated identity intruding into the executive self which would suggest an association between compartmentalization and delusions. However, there has been little empirical investigation of these proposed models and whether delusional ideation is associated with either compartmentalization or detachment type dissociation.

Results from studies that have examined the relationship between the 3 subscales of the DES and delusions are mixed. In correlational studies of those with established psychosis, one study found that delusions as measured by the PANSS, was significantly associated with all DES subscales except amnesia (Perona-Garcelán, Carrascoso-López et al., 2012). Another study found a significant correlation between delusions and the absorption subscale of the DES as well as the pseudo-neurological conversion symptoms added to the German version of the DES (Spitzer et al., 1997). By contrast, Kilcommons and Morrison (2005) found that delusions was not significantly correlated with any subscale of the DES. When using the CDS, significant correlations with the delusions subscale of the PANSS (Perona-Garcelán et al., 2011) and the delusion items of the PSYRATS (Černis et al., 2014) were found in those diagnosed with schizophrenia. Delusional ideation as measured by the SAPS was significantly correlated with scores on the WNDD and 6 items of the SDQ: hearing sounds from nearby that sound far away (item 3), numbing of the body or parts of the body (item 5), having epileptic-like attacks (item 7), being unable to hear or deaf for a while (item 11), being unable to speak or only able to speak with great effort (item 18) and feeling paralyzed for a while (item 19).

Only one study has examined whether a specific type of dissociation might mediate the relationship between childhood trauma and delusions (Cole et al., 2016). As previously mentioned in Section 4.2.2, Cole and colleagues (2016) found in a non-clinical sample, that the relationship between childhood trauma and scores on the PDS were significantly mediated by absorption in the positive direction, and amnesia in the negative direction.

In consideration of the findings from these studies, the evidence for whether delusional ideation is differentially related to compartmentalization or detachment dissociation is inconclusive and warrants additional research.

4.3.3 Testing the Bipartite Model and Psychotic Experiences

Two recent studies have specifically tested whether detachment and compartmentalization are associated with psychotic experiences in those with chronic schizophrenia (Vogel, Braungardt, Grabe, Schneider & Klauer, 2013) and in non-clinical participants (Humpston, Walsh, Oakley, Mehta, Bell & Deeley, 2016). Vogel and colleagues (2013) sought to establish via confirmatory factor analysis whether items on the Association for Methodology and Documentation in Psychiatry - dissociation scale (AMDP) could be separated into compartmentalization and detachment factors in a sample of 72 people with schizophrenia. The study found evidence for a two-factor solution, which more or less fit the theoretical bipartite model. However, several identity related items (uncertainty of own identity and changing identity) which were believed to represent compartmentalization, loaded onto the detachment factor and the two factors were significantly correlated. These findings support the notion that while dissociation can be split into detachment and compartmentalization type experiences, they are often interrelated and not mutually exclusive (Spitzer et al., 2006; Vogel et al., 2013; Vogel, Schatz et al., 2009). In addition, Vogel and colleagues (2013) found both the 'detachment' and 'compartmentalization' factors correlated with the positive symptoms subscale of the PANSS ($r = .52$ and $r = .32$) respectively, and the 'compartmentalization' factor significantly correlated with negative symptoms. However, the symptoms of hallucinations and delusions were not investigated separately.

Humpston and colleagues (2016) investigated the relationship between detachment and compartmentalization type dissociation and psychosis-like experiences in a sample of 215 non-

clinical participants. The authors employed the Cardiff Anomalous Perceptions Scale (CAPS) to capture anomalous perceptual experiences in various sensory domains and hallucinatory experiences. The PDI was used to measure delusional experiences. Compartmentalization was indexed by the Harvard Group Scale of Hypnotic Susceptibility: Form A which measures the degree to which an individual's experiences are affected by hypnotic suggestions. The DES was used to capture detachment dissociation and the TAS was used to measure absorption. The results of the hierarchical linear regression analysis indicated that scores the DES and TAS were the only significant predictors of delusions and anomalous perceptual experiences in the final model. The findings of this study were similar to Vogel et al (2013), in that detachment rather than compartmentalization dissociation appears to be associated with psychotic experiences. However, there are methodological issues with Humpston et al.'s (2016) study which mean that the results should be interpreted with caution. For instance, the DES total score was used as an index of detachment dissociation. As discussed in Section 3.3, there is a subscale of the DES which reflects amnesic experiences and therefore, could be considered compartmentalization-type dissociation. Thus, whether the DES total score can be considered a 'clean' measure of detachment-dissociation is questionable.

Overall, there is some indication that hallucinatory experiences might be differentially related to a distinct type of dissociation, particularly detachment dissociation. However, given there are methodological concerns associated with how experiences of detachment are quantified in those with psychosis, the results should be cautiously interpreted and continued investigation is warranted. Evidence for a differential relationship between the two types of dissociative experiences outlined in the bipartite model and delusional ideation is less established and requires further examination.

To date, no studies have examined the relationship between the bipartite model of dissociation and hallucinations, delusions in a FEP sample. The shift in the conceptualization

of dissociation from a broad unidimensional construct to one defined as consisting of two distinct types of dissociation improves the research and clinical utility of the construct. Therefore, it is important for research in this area to continue examining how hallucinations and delusions are related to this bipartite model of dissociation. This will give us a greater understanding of the precise dissociative mechanisms that might underlie hallucinatory and delusional experiences. Leading to more targeted interventions and better treatment outcomes for those who experience psychosis.

4.4 Measurement Issues

A methodological issue that arises in this area of research concerns the predominant use of the DES and other self-report measures of dissociation to examine the relationship between dissociation and positive psychotic symptoms (i.e., hallucinations and delusions). The vast majority of studies have utilized an iteration of the DES to capture dissociative experiences in groups with psychosis (Renard et al., 2017). However, several researchers have questioned whether there is potential item-content overlap between the DES and measures of positive psychotic symptoms which might conflate the relationship, particularly with hallucinatory experiences (Perona-Garcelán, Carrascoso-López et al., 2012; Ross, 2007; Schäfer et al., 2008; Schäfer et al., 2012). Indeed, item 27 of the DES asks directly about experiences of voice hearing. Although the few studies which have removed question 27 from their analysis found that the relationship between psychotic and dissociative experiences remained significant (Perona-Garcelán, Carrascoso-López et al., 2012; Longden, et al, 2016; Varese, Barkus et al., 2012).

However, there are numerous other items of the DES that reflect perceptual disturbances and reality distortions which may not adequately discriminate between

dissociative and hallucinatory experiences. Indeed, it has been suggested that all six items on the depersonalization/derealization subscale of the DES represent such perceptual experiences (Schäfer et al., 2012). The phenomena described in these items could reflect hallucinations themselves or reactions to them. The potentially overlapping items of the DES are presented in Table 4.2.

Table 4.2

Items of the Dissociative Experiences Scale (DES) that potentially overlap with hallucinatory experiences

DES Subscale	Item Number and Description
Depersonalization/derealization	**Item 7:** Some people 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.
	Item 11: Some people have the experience of looking in a mirror and not recognizing themselves.
	Item 12: Some people have the experience of feeling that other people, objects, and the world around them are not real.
	Item 13: Some people have the experience of feeling that their body does not seem to belong to them.
	Item 27: Some people hear voices inside their head that tell them to do things or comment on things that they are doing.
	Item 28: Some people feel as if they are looking at the world through a fog, so that people and objects appear far away or unclear.
Absorption	**Item 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.

Furthermore, a confirmatory factor analytic study demonstrated significant issues when attempting to differentiate between depersonalization/detachment dissociation and psychotic-like experiences associated with schizotypy (Watson, 2001). Watson (2001) sought to establish whether measures of schizotypy and dissociation assessed two distinct constructs or whether they measured a single, undifferentiated factor. Confirmatory factor analyses were conducted on two non-clinical samples, [sample 1 ($n = 471$) and sample 2 ($n = 457$)], using self-report

measures such as the Perceptual Aberration scale, the Magical Ideation scale and the Schizotypal Personality scale to capture schizotypal experiences and the DES, Questionnaire of Experiences of Dissociation (QED) and the Dissociative Processes Scale (DPS) to measure dissociation. While the results for both samples suggested that the two-factor solution was superior to the single-factor solution, it was found that the level of differentiation between the two factors was weak with factor correlations of ($r = .85$) and ($r = .87$) for sample 1 and sample 2 respectively. In further examining the influence of specific item content, Watson (2001) found that the overlapping content was confined almost entirely to the depersonalization/detachment subscales of each measure of dissociation. A subsequent factor analysis was conducted utilizing only the detachment/depersonalization items from each measure of dissociation and it was found that dissociative experiences were not clearly distinguishable from schizotypy. With factor correlations of ($r = .90$) and ($r = .99$) for sample 1 and sample 2 respectively. The differentiation between these two factors was slightly improved when the depersonalization/detachment items were removed from the factor analysis and factor correlations were reduced to ($r = .77$) for sample 1 and ($r = .75$) for sample 2 (Watson, 2001). Watson (2001) suggested that the removal of depersonalization/detachment type items from these measures of dissociation, could enhance the differentiation between psychotic-like experiences associated with schizotypy and dissociation. Although such factorial analyses have not been conducted using measures of psychotic symptoms in those with clinical psychosis, given that schizotypy represents a latent personality structure associated with a vulnerability to schizophrenia-spectrum disorders (Barrantes-Vidal, Grant & Kwapil, 2015), it is plausible that similar issues of construct differentiation and content overlap may also arise.

Concerns with the use of DES as a reliable measure of dissociation in those with psychosis was further raised in a study by Schäfer and colleagues (2012). While scores on the DES are generally regarded as a stable indicator of dissociative experiences, in one study, the

prediction of dissociation fluctuated based on the acuity of psychotic symptoms (Schäfer et al., 2012). Schäfer and colleagues (2012) investigated the relationship between psychotic symptoms and dissociation during hospital admission and after discharge, it was found that positive psychotic symptoms were the best predictor of dissociation at the time of admission when symptoms were the most acute (Schäfer et al., 2012). However, once participants were stabilized, the best predictor of dissociation was childhood sexual abuse. The authors suggest that item overlap between the measures of dissociation (DES) used in their study and psychotic symptoms could explain the varying results in the prediction of dissociation at the two time points (Schäfer et al., 2012). It may be that scores on the DES are not always independent, stable measures of dissociative experiences in samples with psychosis and they may vary systematically with the severity of positive psychotic symptoms. These findings from Schäfer and colleagues (2012) have implications for the reliability of the DES to quantify dissociation in samples with psychosis.

An additional concern regarding the use of the DES as well as other self-report measures of dissociation is the ability of those with psychosis to accurately understand and assess the content of questions (Perona-Garcelán, et al., 2011 Schäfer et al., 2008; Schäfer, et al., 2012). It was noted in Perona-Garcelán and colleagues' (2011) study that some of their participants with schizophrenia had difficulty understanding the content of the self-report instruments employed in their study, this includes the Cambridge Depersonalization Scale (CDS), which is another commonly used measure of depersonalization/derealization. The authors described that when participants expressed difficulties with comprehending an item, the researcher would carefully explain the meaning of the item and then ask for feedback from the participant to check their understanding. Through the use of a clinician-administered instrument, such difficulties with comprehension are addressed as a matter of course and in a more structured way. It is understandable that participants with psychosis might have

difficulties comprehending the content of these self-report measures given that dissociation, hallucinations and delusions are considered complex psychological constructs. Often psychotic and dissociative symptoms have similar manifestations but different connotations, therefore, adequate self-awareness of symptom phenomenology would be required to differentiate between these symptom types (Steinberg et al., 1994).

In the case of delusions, the utilization of a clinician-rated measure, such as the Structured Clinical Interview for DSM-IV Dissociative Disorders - Revised (SCID-D-R; Steinberg, 1995), would assist a clinician in distinguishing conceptually between delusional ideation and dissociation (Steinberg, et al., 1994). For example, when a person is asked "Have you ever had the feeling that you were a stranger to yourself?" on the SCID-D, for those with schizophrenia, the feelings of self-estrangement often happen exclusively in the context of delusional beliefs concerning identity, whereas, dissociative self-estrangement often has an 'as if' quality and is not associated with delusional ideation (Steinberg et al., 1994). Adequate awareness of symptom phenomenology is often required to differentiate between dissociative and psychotic symptomatology (Steinberg, 2000). A study on the assessment of dissociative symptoms in schizophrenia emphasized the importance of context in distinguishing between dissociative and delusional phenomena (Steinberg, et al., 1994). Those with schizophrenia may lack insight into the phenomenological characteristics of their symptoms and this may affect the accuracy of their self-report. With a clinician-administered measure, the assessor can vary their language or use clarifying information to explain potential differences between dissociative and psychotic symptoms during the assessment.

Studies using clinician-rated measures, such as the Dissociative Disorders Interview Schedule (DDIS; Ross & Keyes, 2004) and The Association for Methodology and Documentation in Psychiatry - dissociation scale (AMDP; Vogel, Schatz et al., 2009) have found associations between dissociation and psychotic symptoms. However, to date no study

has employed a clinician-rated instrument of dissociation to directly investigate whether dissociative symptoms mediate the relationship between childhood trauma and hallucinations and delusions. There is evidence to suggest that in people with psychotic disorders, the use of the DES or SCID-D-R can lead to differences in the measurement of dissociative symptoms. High scores on the DES failed to correspond with a dissociative disorder diagnosis on the SCID-D-R (Laferrière-Simard Lecomte & Ahoundova, 2014).

It is important to replicate and validate findings for the relationship between dissociation, hallucinations and delusions using measures other than the DES or self-report measures to quantify dissociative experiences. If a relationship between these complex constructs can be convergently established using various methodologies and forms of instruments this will increase confidence in the empirical accuracy of the findings.

4.5 The Co-occurrence of Psychotic and Dissociative Disorders

As presented in Sections 4.2 and 4.3 of this chapter, there is increasing evidence of a relationship between psychotic and dissociative symptomatology in those with established psychotic disorders. This association is further demonstrated on the diagnostic level with numerous researchers suggesting that there is a significant diagnostic co-occurrence between psychotic and dissociative disorders (e.g., Gainer, 1994; Renard, et al., 2017; Ross, 2009). This is especially the case for those diagnosed with DID and schizophrenia-spectrum disorders (e.g., Ross, 2006; Ross, 2007; Ross, 2009).

Understanding the extent of this diagnostic co-occurrence is also clinically important for several reasons. Firstly, a clearer picture of the co-occurrence of psychotic and dissociative disorders has significant theoretical and clinical implications for our understanding of the nature and classification of these disorders. Indeed, given the relationship between psychotic

and dissociative symptomatology and the co-occurrence of psychotic and dissociative disorders, several researchers have questioned the hard, categorical classification of these two diagnostic groups (e.g., Renard, et al., 2017; Ross, 2004). Two theoretical frameworks proposed to account for the co-occurrence of psychotic and dissociative symptoms and disorders will be discussed in Section 4.5.1 and 4.5.2 below.

Secondly, the treatment recommendations and choices can be vastly different for those diagnosed with schizophrenia compared to those with dissociative disorder. That is, treatments for those with schizophrenia-spectrum disorder tend to be pharmacological and involve the prescription of antipsychotic medication, by contrast psychotherapeutic approaches are recommended for treating dissociative disorders. Therefore, a more precise understanding of the commonalities between these two diagnostic groups can lead to the selection of more appropriate and effective treatments.

In several early studies of those with DID, between 16% and 50% of participants had a prior diagnosis of a schizophrenia spectrum disorder based on assessment by treating clinicians and had received treatment for psychosis (Boon & Draijer, 1993; Putnam, Guroff, Silberman, Barban & Post, 1986; Ross, Norton & Wozney, 1989; Ross, Miller et al., 1990). Ellason and colleagues (1996) found that 74.3% of the DID sample met diagnostic criteria for a psychotic disorder when using the Structured Clinical Interview for DSM-III-R: 49.5% were diagnosed with schizoaffective disorder, 18.7% met criteria for schizophrenia, 2.8% received a diagnosis of psychotic disorder not otherwise specified (NOS) and 1.9% had a delusional disorder (Ellason, Ross & Fuchs,1996). Furthermore, one study found that people with DID also demonstrated significant elevations on the schizophrenia scale of the Minnesota Multiphasic Personality Inventory (Bliss, 1984).

An early researcher of schizophrenia, Kurt Schneider, identified several core or 'first-rank' symptoms that were considered pathognomonic of the condition (Nordgaard, Arnfred,

Handest & Parnas, 2008). Several studies found that people with DID experienced more Schneiderian 'first-rank' symptoms such as voices arguing or commenting, thought insertion, withdrawal or broadcasting, delusional perceptions, made actions and somatic passivity compared to groups with schizophrenia (Laddis & Dell, 2012; Ross, Miller et al., 1990). Additionally, those with DID scored significantly higher on the positive syndrome scale of the PANSS compared with those with schizophrenia. By contrast those with schizophrenia had significantly higher scores on the negative syndrome scale compared with DID (Ellason & Ross, 1995). Given these findings, the authors suggest that a focus on positive symptomatology may lead to false-positive diagnoses of schizophrenia and false-negative diagnoses of DID (Ellason & Ross, 1995).

Although many large-scale studies have reported rates of dissociative disorders in psychiatric inpatients, often rates of comorbid psychotic conditions were not reported or only a small minority of those sampled had a primary diagnosis of schizophrenia, or other psychotic disorders (e.g., Friedl & Draijer, 2000; Gast, Rodewald, Nickel & Emrich, 2001; Horen, Leichner & Lawson, 1995; Latz, Kramer & Hughes, 1995; Modestin, Ebner, Junghan & Erni, 1996; Ross, Anderson, Fleisher & Norton, 1991; Ross, Duffy & Ellason, 2002 Saxe et al., 1993; Tutkun, Şar, Yargiç, Özpulat, Yanik, & Kiziltan, 1998). In investigating the prevalence of dissociative disorders in psychiatric inpatients only one study was conducted on a sample where the majority of participants were acknowledged as having a primary diagnosis of schizophrenia (84.9% of the sample) (Yu et al., 2010). Yu and colleagues (2010) recruited a total of 569 consecutively admitted inpatients attending the Shanghai Mental Health Center in China. They completed the DDIS and clinical interview on 96 randomly selected participants from the total pool. Weighted prevalence rates were calculated and suggested that a total of 15.3% of participants met DSM-IV-TR criteria for a dissociative disorder; 5.1% had dissociative amnesia, 1.6% had depersonalization disorder, .5% met criteria for DID, .5% had

dissociative fugue and 7.5% received a diagnosis of DDNOS (Yu et al., 2010). By contrast, in another inpatient study which compared the prevalence of dissociative disorders in those with BPD and schizophrenia, none of the inpatients diagnosed with schizophrenia-spectrum disorders had a co-occurring dissociative disorder according to ratings on the SCID-D (Tschoeke, Steinert, Flammer, & Uhlmann, 2014). However, the sample size of the group with schizophrenia in Tschoeke and colleagues' (2014) study was relatively small ($n = 21$) and sampling variability may explain the lack of finding.

A few studies have investigated the prevalence of dissociative disorders in outpatients with chronic schizophrenia utilizing a clinician-administered tool of dissociation such as the DDIS or the SCID-D (Haugen & Castillo, 1999; Moise & Leichner, 1996; Ross & Keyes, 2004; Steinberg et al., 1994). Moise and Leichner (1996) recruited 53 participants with schizophrenia and completed both the DDIS and SCID-D with participants who scored higher than 25 on the DES. While 14 outpatients had a score higher than 25 on the DES, only six completed the diagnostic interviews. Two of the six participants (33%) who completed the DDIS and SCID-D met criteria for dissociative amnesia, no other dissociative disorder was present (Moise & Leichner, 1996). The authors estimated that approximately 9% of their total sample would meet criteria for a dissociative disorder. However, Moise and Leichner (1996) acknowledged that the high number participants who refused to be interviewed was a significant limitation of the study and may have biased the results.

Ross and Keyes (2004) administered the DES and DDIS to 60 participants with chronic schizophrenia to separate those with high levels of dissociation (i.e., scores of 25 or higher on the DES and/or diagnosed with a dissociative disorder) from those with low dissociation (i.e., scores under 10 on the DES). Of the 36 participants considered to have high levels of dissociation, 44% met criteria for DID (Ross & Keyes, 2004).

Two studies utilized the SCID-D to examine not only the prevalence of dissociative

disorders in outpatients with schizophrenia spectrum disorder but also the prevalence of dissociative symptoms considered to be clinically significant (i.e., rated as moderate or severe on the SCID-D). In a sample of 31 outpatients diagnosed with either chronic schizophrenia (*n* = 17) or schizoaffective disorder (*n* = 14), Steinberg and colleagues (1994) found that approximately 9.7% of the total sample met criteria for DID (6% of the schizophrenia group and 14% of the schizoaffective disorder group). Steinberg and colleagues (1994) also examined the prevalence of clinically significant dissociative symptoms (i.e., subscales of the SCID-D rated as moderate or severe) in the group with schizophrenia spectrum disorder. They found that 57.1% experienced dissociative amnesia at clinical levels, 57.1% reported depersonalization at elevated levels, 42.9% experienced clinical levels of derealization, 46.4% had identity confusion, 32.1% experienced clinical levels of identity alteration and 28.6% reported total SCID-D scores at the moderate to severe level (Steinberg et al., 1994).

A similar prevalence of clinically significant dissociative symptoms in those with chronic schizophrenia was found in a study conducted by Haugen and Castillo (1999). Haugen and Castillo (1999) utilized the SCID-D and found in a sample of 50 outpatients with schizophrenia that 50% met criteria for a current dissociative disorder, 12% had a past dissociative disorder diagnosis and 38% demonstrated no evidence of a dissociative disorder. In terms of specific dissociative disorders, a lifetime prevalence of 4% was reported for dissociative amnesia, 14% for DID, 8% for depersonalization disorder, 14% prevalence of DDNOS and 22% for trance disorder (Haugen & Castillo, 1999). Many participants in Haugen and Castillo (1999) study also experienced clinical levels of dissociative symptoms, 34% experienced dissociative amnesia at clinical levels, 48% depersonalization, 22% derealization, 46% identity confusion and 46% reported experiences of identity alteration at clinically significant levels.

Considering there is increasing evidence for the co-occurrence of psychotic and

dissociative disorders and symptoms. Several distinct frameworks have been proposed to assist in our understanding of the diagnostic co-occurrence and commonalities in dissociative and psychotic phenomena (Renard et al., 2017; Ross, 2004). On the diagnostic level, Ross (2004) recognized the frequency of dissociation and experiences of trauma in those with schizophrenia and described a dissociative subtype of schizophrenia. The concept and evidence for the dissociative subtype of schizophrenia will be discussed in Section 4.5.1 below. More recently, the network structure model of psychopathology was applied to understand the co-occurrence of psychosis and dissociation on the symptom level (Renard et al., 2017). How the network structure model can be applied to understand the co-occurrence of psychotic and dissociative symptoms will be discussed in Section 4.5.2. At the core, both these theoretical frameworks suggest a need to revise the 'rigid' categorical approach to our understanding of the etiology, treatment and classification of phenomena in the dissociative and psychotic domains.

4.5.1 Dissociative Subtype of Schizophrenia

According to Ross (2006) the dissociative subtype of schizophrenia resides between non-dissociative schizophrenia and DID on a spectrum of psychopathology. The essential characteristics of the dissociative type of schizophrenia are "more positive symptoms of psychosis, fewer negative symptoms, more comorbidity on both Axis I and Axis II disorders, higher scores on measures of dissociation, a greater amount of psychological trauma, more of the psychobiology of trauma, less of the psychobiology of endogenous, biomedical forms of schizophrenia, greater response to trauma therapy, more clearly defined, structured and dissociated identity states and greater capacity for the voices to engage in psychotherapy. The dissociative subtype of schizophrenia may also have differential response to antipsychotic medications" (Ross, 2006, p. 252). The diagnostic criteria for dissociative schizophrenia describes the condition as a type of schizophrenia, where the clinical presentation is dominated by at least three of the following six features: (1) dissociative amnesia, (2) depersonalization,

(3) the presence of two or more distinct personalities or identity states, (4) auditory hallucinations, (5) extensive comorbidity and (6) severe childhood trauma (Ross, 2004; Ross, 2008). However, the prerequisite of childhood trauma is not absolute, and in some cases dissociative schizophrenia arise from genetic or physiological factors (Ross, 2008). Ross (2008) further suggested that psychotherapeutic interventions designed for DID and other dissociative disorders should also be effective in treating those with dissociative schizophrenia.

Several studies have reported findings that were largely consistent with the clinical description of dissociative schizophrenia (Ross & Keyes, 2004; Şar et al., 2010). In a group of 60 individuals receiving long-standing treatment for schizophrenia, Ross and Keyes (2004) examined the clinical profile of those with high levels of dissociation (participants who scored 25 or greater on the DES and/or met criteria for a dissociative disorder on the DDIS) and low dissociation (participants who scored 10 or less on the DES and did not meet requirements for a dissociative disorder on the DDIS). They found that when compared to those with low dissociation, those who were high on dissociation had significantly higher rates of childhood sexual and physical abuse as measured by abuse items on the DDIS, experienced greater comorbidity with both Axis I and Axis II disorders (e.g., substance abuse, somatization disorder, depression, BPD, DID) as determined by the DDIS and higher levels of psychotic symptomatology as measured by the SAPS and SANS (Ross & Keyes, 2004). Ross and Keyes (2004) suggested that the results from their study indicated that there was a substantial subgroup (60%) of those with schizophrenia who present with a clinical profile reflecting the dissociative subtype of schizophrenia.

Additional support for the dissociative subtype of schizophrenia comes from a study which attempted to classify 70 participants with chronic schizophrenia into four groups using *k*-means cluster analysis, based on their scores on 11 variables entered into the analysis. These variables included: secondary features of DID, somatic complaints, extrasensory perceptions,

Schneiderian symptoms, BPD criteria (SCID-II), total number of lifetime and current SCID diagnoses, positive and negative symptoms (SAPS and SANS respectively), total childhood trauma (CTQ) and the DES. The authors found two groups characterized by high dissociative symptomatology such as the secondary features of DID and elevated DES scores (Şar et al., 2010). Consistent with the clinical description of the dissociative subtype of schizophrenia, these high dissociation groups also had significantly more Schneiderian symptoms, extrasensory perceptions, somatic complaints, total childhood trauma scores and BPD criteria than the two low dissociation groups. Positive psychotic symptoms were also the most predominant in one of the high dissociation groups compared to the low dissociation groups. Furthermore, Şar and colleagues (2010) reported that there was no relationship between the any of the 'classical subtypes of schizophrenia', such as paranoid, catatonic, disorganized, undifferentiated and residual types and the dissociative subtypes derived in the cluster analysis this suggests the dissociative subtype of schizophrenia might be independent from other sub-categories of schizophrenia. However, contrary to the criteria for the dissociative subtype of schizophrenia, the overall number of psychiatric comorbidities was not exclusively associated with the high dissociation groups (Şar et al., 2010). Şar and colleagues (2010) suggest that overall their findings were largely consistent with the proposed dissociative subtype of schizophrenia.

While there appears to be some support for the dissociative subtype of schizophrenia, some authors have questioned the need and benefit of creating a new diagnostic subtype to account for the co-occurrence of dissociative and psychotic syndromes (Laferrière-Simard et al., 2014). The authors suggest that there is a current bias in diagnosing a primary psychotic disorder as soon as 'psychotic' symptoms such as hallucinations are disclosed (Laferrière-Simard, et al., 2014). This diagnostic foreclosure means that other alternative diagnoses or co-occurring conditions are left unrecognized. Laferrière-Simard and colleagues (2014) suggest

that clinicians and others in the field may benefit from a more global understanding of clinical presentations and be trained in recognizing all symptoms that might be present, regardless of the formal diagnosis, this includes dissociation. Irrespective of the benefits in clinical utility of the dissociative subtype of schizophrenia, the empirical validity of this proposed subtype requires further research and investigation.

4.5.2 Network Structure Model for Psychotic and Dissociative Symptomatology

It has been suggested by Renard and colleagues (2017) that the network approach of mental disorders and comorbidity (Borsboom & Cramer, 2013; Borsboom, Cramer, Schmittmann, Epskamp & Waldorp, 2011) may be applicable in advancing our understanding of the co-occurrence of dissociative and psychotic symptomatology. According to the network model, symptoms are not passive, psychometric indicators of latent conditions, but rather they are components in a network and can have a direct causal effect on the generation of other symptoms. Therefore, symptoms themselves can play an integral part in the etiology of a disorder (Borsboom & Cramer, 2013; Borsboom et al., 2011). According to this network model, comorbidity is believed to be the product of direct interactions between the symptoms of multiple disorders. The authors give as an example, the causal process in which the symptoms of Major Depressive Disorder (MDD) such as sleep deprivation and concentration problems might give rise to and interact with symptoms associated with Generalized Anxiety Disorder (GAD) such as fatigue and irritability resulting in comorbidity between the two conditions (Borsboom et al., 2011). Sleep deprivation (associated with MDD) can lead to fatigue (associated with GAD) which causes problems with concentration (MDD) and finally gives rise to symptoms of irritability (GAD), thus the presence of certain symptoms can initiate an interactive causal chain that results in symptoms associated with a comorbid condition (Borsboom et al., 2011).

In this model, psychiatric disorders may reflect a causal interplay between symptoms and not necessarily an underlying disease entity (Borsboom & Cramer, 2013; Renard et al., 2017). Furthermore, these networks of interacting symptoms are idiographic, and may be different for individuals experiencing the same symptoms. Therefore, personality and environmental factors likely influence these networks (Renard et al., 2017). In the case of dissociative and psychotic symptoms, it may be that certain symptoms of dissociation, for example depersonalization/derealization leads to perceptual distortions or impaired reality-testing resulting in hallucinations (Renard et al., 2017). However, how this novel approach to understanding the co-occurrence of dissociative and psychotic symptoms and requires further empirical investigation.

In sum, there is evidence for the co-occurrence of psychotic and dissociative disorders and symptoms (e.g., Boon & Draijer, 1993; Ellason et al., 1996; Ellason & Ross, 1995; Haugen & Castillo, 1999; Moise & Leichner, 1996; Putnam, Guroff, Silberman, Barban & Post, 1986; Ross & Keyes, 2004; Ross et al., 1989; Ross, Miller et al., 1990; Steinberg et al., 1994). In an attempt to understand this co-occurrence, some researchers suggest that the rigid boundaries between psychotic and dissociative disorders might need to be reconsidered (e.g., Renard et al., 2017; Ross, 2004). At the time of writing, no studies have examined the prevalence of diagnosable dissociative disorders and clinically significant dissociative symptoms in early psychosis. Given that there are significant differences in the level of self-reported dissociative experiences in those with FEP and chronic schizophrenia (Braehler et al., 2013), the generalization of results from existing studies with chronic psychosis to those with FEP may be inaccurate. It is important to examine the prevalence of dissociative disorders and symptoms in FEP to determine the extent of people with early psychosis who may have unmet mental health needs.

Chapter 5. Rationale, Aims and Hypotheses

5.1 Rationale

It has been established in the literature that there are associations between experiences of trauma in early life and the positive symptoms of psychosis, particularly hallucinations and delusions (Bailey et al., 2018; Varese, Smeets et al., 2012). Dissociation has emerged a potential mechanism in the relationship between childhood trauma and psychosis. There is increasing evidence that dissociation may play a mediating role in the relationship between childhood trauma and experiences of hallucinations and potentially delusions (e.g., Cole et al., 2016; Varese, Barkus et al., 2012; Williams et al., 2018). In reviewing the extant literature, a number of gaps were identified. This thesis sought to investigate and extend current knowledge regarding the relationship between childhood trauma, dissociation and psychosis with due consideration to these identified issues.

In terms of gaps in the research, firstly, there is a paucity of research in the area that has utilized a first episode psychosis (FEP) sample. It has been recommended in the literature that future research should examine the relationships between childhood trauma, dissociation and psychosis in an FEP group (e.g., Şar et al., 2010). Groups with chronic schizophrenia tend to have a long-standing history of neuroleptic, pharmacological treatment compared with FEP (Şar et al., 2010). Such differences in the clinical profile may result in differences in findings for those with chronic schizophrenia compared with FEP. In the one study that compared FEP with chronic schizophrenia, the chronic group reported significantly higher levels of dissociation, as measured on the Dissociative Experiences Scale (DES), than the FEP group (Braehler et al., 2013). Findings from samples with chronic schizophrenia may not generalize accurately to a FEP sample. Therefore, the relationship between dissociation and psychotic

symptoms, and whether dissociation mediates the relationship between childhood trauma and hallucinations and delusions should also be examined in a group with early psychosis.

The lack of studies in FEP also extends to those investigating the co-occurrence of psychotic and dissociative disorders. Most studies which have examined the prevalence rates of dissociative disorders and clinically-significant dissociative symptoms in people with schizophrenia have recruited a chronic sample. To our knowledge, no studies have investigated the prevalence of dissociative disorders and clinically significant dissociative symptoms in people with FEP using a structured, clinician-rated measure. However, as previously mentioned, given the significant differences in DES scores between those with chronic schizophrenia and FEP, the prevalence rates of dissociative symptoms and disorders may also vary. These prevalence rates were not reported in Braehler and colleagues' (2013) study as only the DES was used. The DES is designed as a screening tool for dissociative experiences and provides limited information for diagnosing dissociative disorders and pathological symptoms (Draijer & Boon, 1993). Gaps in knowledge regarding the prevalence of dissociative symptomatology in FEP means there may be a subgroup of those with early psychosis who have unmet mental health needs.

A second issue is that the vast majority of studies examining the relationship between childhood trauma, dissociation and psychotic symptoms have utilized the DES to quantify experiences of dissociation (Renard et al., 2017). There is a relative lack of studies which have used other measures of dissociation and especially in formats other than self-report to capture dissociative experiences in groups with psychosis. Given that methodological concerns have been expressed regarding the use of the DES in those with psychosis (e.g., Perona-Garcelán, Carrascoso-López et al., 2012; Schäfer et al., 2008; Schäfer et al., 2012), it is especially important to replicate current findings using alternative measures (i.e., a clinician-rated instrument) (Schäfer et al., 2008). If convergent results can be found when employing different

methodologies to quantify the constructs of interest, this can increase confidence in the validity of existing findings.

In recent decades there has been a shift in our understanding of dissociation from a unidimensional construct to a bipartite model. The bipartite model describes the existence of two qualitatively distinct types of dissociation – detachment and compartmentalization (e.g., Holmes et al., 2005). However, research into how these two types of dissociation might relate to psychotic symptoms, particularly hallucinations and delusions is still in its infancy and warrants further investigation. Using the bipartite model of dissociation may provide a more nuanced understanding of the relationship between dissociative and psychotic symptomatology. Improved knowledge will ultimately have significant implications for clinical practice and assist in the development of more effective psychotherapeutic interventions for those experiencing psychosis.

5.2 Research Aims and Hypotheses

Overall, the main aim of this thesis was to investigate within an FEP cohort (1) the prevalence of dissociative disorders and symptoms, (2) the role of dissociative mechanisms on the relationship between childhood trauma and hallucinations and delusions as well as (3) the relationship between hallucinations and delusions and the different types of dissociation proposed in the bipartite model. We further sought to address a methodological gap in the literature by investigating the relationship between dissociation and psychosis utilizing a clinician-administered measure of dissociation, namely the SCID-D-R. With respect to our main aim, three additional aims and associated hypotheses were derived and are outlined below.

5.2.1 Aim One

The first aim was to determine whether there was (a) a subgroup of those with FEP who also meet DSM-IV-TR criteria for a dissociative disorder on the SCID-D-R, (b) a subgroup of FEP who also experienced 'clinically significant' dissociative symptoms (i.e., symptoms rated as moderate to severe on the SCID-D-R), and (c) a difference in the prevalence of clinically significant dissociative symptoms in those with or without a history of childhood trauma.

5.2.1.1 Hypotheses for Aim One

It was hypothesized that for the entire sample of FEP:

(1) There will be a subgroup who will meet DSM-IV-TR criteria for a dissociative disorder based on the SCID-D-R.

(2) There will be a subgroup who experience dissociative symptoms (i.e., amnesia, depersonalization, derealization, identity confusion, identity alteration) rated as moderate or severe on the SCID-D-R.

(3) There will be a significantly higher prevalence of dissociative symptoms rated as moderate to severe on the SCID-D-R in a group with childhood trauma compared to a group with no trauma history.

5.2.2 Aim Two

The second aim of the study was to investigate the relationship between childhood trauma, hallucinations and delusions, and the mediating role of dissociation, in a FEP sample using a clinician-administered measure of dissociation (i.e., SCID-D-R).

5.2.2.1 Hypotheses for Aim Two

Based on previous research, it was predicted that:

(1) Greater severity of self-reported trauma (CTQ) will correspond with an increased experience of dissociative symptoms, measured by the total score on the SCID-D-R.

(2) Increased experience of dissociation (total score on the SCID-D-R) would be associated with higher levels of

    (a) hallucinations (as measured by the hallucinations subscale of the PANSS),

    (b) delusions (as measured by the combined scores on the delusions and suspiciousness/persecution subscales of the PANSS).

(3) Dissociation (SCID-D-R total score) will mediate the relationship between

    (a) childhood trauma (CTQ) and hallucinatory experiences (PANSS-hallucinations subscale),

    (b) childhood trauma (CTQ) and delusional ideation (PANSS-delusions and PANSS-suspiciousness/persecution subscales).

5.2.3 Aim Three

The third aim was to examine the relationships between the two types of dissociation (i.e., compartmentalization and detachment) proposed in the bipartite model and symptoms of hallucinations and delusions. Given the mixed theories and findings in the literature with regards to the proposed relationship between the two types of dissociation and hallucinations and delusions, no specific hypotheses were set, rather a series of research questions were posed.

5.2.3.1 Research Questions for Aim Three

(1) Are hallucinations (PANSS-hallucinations subscale) related to compartmentalization dissociation (sum of amnesia, identity confusion and identity alteration subscales on the SCID-D-R) and/or detachment dissociation (sum of depersonalization and derealization subscales on the SCID-D-R)?

(2) Are delusions (sum of PANSS-delusions and PANSS-suspiciousness/persecution subscales) related to compartmentalization dissociation (sum of amnesia, identity confusion and identity alteration subscales on the SCID-D-R) and/or detachment dissociation (sum of depersonalization and derealization subscales on the SCID-D-R)?

Chapter 6. Methodology

6.1 Research Setting

The study was conducted through Orygen Youth Health (OYH), which is a public, specialist mental health service for young people aged 15-25 years residing in the Western and North Western regions of metropolitan Melbourne, Australia. The catchment area captures approximately 1.2 million people, of whom roughly 250,000 are in the appropriate age range. The Western and North Western catchment area services the growth corridors of Melbourne. These expanding urban areas are considered amongst the most socio-economically disadvantaged regions of Melbourne. OYH provides comprehensive services to young people with mental health issues, including inpatient facilities and several specialist clinical programs.

Participants from the study were specifically recruited from the Early Psychosis Prevention and Intervention Centre (EPPIC) service at OYH. EPPIC is a clinical program that provides ongoing case management, psychotherapeutic and medical care to eligible clients experiencing FEP for a period up to two years.

This thesis occurred in the context of a broader research project that examined the relationships between post-traumatic intrusions, avoidance, dissociation and psychotic symptoms in a FEP sample. The research project formed the basis of two doctoral theses. Both doctoral candidates Ms. Pamela Sun (P.S.) and Ms. Natalie Peach (N.P.) assisted in participant recruitment, data collection and data entry for the broader project. Only the materials, procedures and analyses relevant to the current thesis will be described in this methodology section

6.2 Ethics Approval and Ethical Considerations

6.2.1 Ethics Approval

All research projects conducted through Orygen Youth Health (OYH) require initial approval from the OYH Research and Review Committee (RRC) before submission to Melbourne Health Human Research Ethics Committee (MH HREC). An application for ethics approval was submitted to Melbourne Health Human Research and Ethics Committee (MH HREC) on the 27th of November 2013. Final MH HREC approval was obtained on the 25th of March 2014 (see Appendix A). Additional ethics approval was given by Monash University HREC (MU HREC) on the 26th of May 2014 (Appendix B).

6.2.2 Ethics Amendment

Due to the slow rate of recruitment, an additional recruitment strategy which lessened the workload required by case managers to refer potential participants to the study was devised. An amendment for this alternative recruitment method was sought on the 31st of August, 2015 and was approved on the 9th of September, 2015 (see Appendix C). A detailed account of this recruitment strategy will be provided under the participant recruitment Section (6.5.1).

6.2.3 Managing Risk and Safety

As the assessment required participants to recount their experiences of trauma and trauma-related symptoms, a protocol was devised to manage any distress or safety/risk issues emerging from such questions. The protocol stated that if participants became distressed during the assessment, the interview would be paused immediately and the level of distress assessed using clinical interviewing. In cases of low-level distress, a break would be offered and the

interviewer would check if the participant wished to continue with the session once the participant's distress had subsided.

When participants reported severe distress or wished to withdraw participation, the session would be terminated. In cases of withdrawn consent, the entirety of the participant's data would be discarded. In the event of distress, the participant could also choose to postpone the session. In all cases, participants who reported distress would be offered debriefing from Dr. Sarah Bendall (S.B.), an experienced, registered clinical psychologist. No participants experienced severe distress which required follow-up debriefing.

The protocol also documented the management procedure if current sexual or physical abuse or neglect was disclosed, either towards a participant under the age of 16 years or another child. In such cases, measures would be undertaken to ensure the safety of the child (i.e., reporting to the Department of Human Services). In the instance of this occurring, the participant's case manager would also be informed and the assessment with the participant postponed. No disclosures of current abuse were made during the course of the study, consequently mandatory reporting was not required.

6.3 Participants

For the current study, seventy young people with FEP were recruited when they were deemed 'clinically stabilized' by their case managers. Participants were considered clinically stabilized when they had engaged with the service, had some insight into their condition, and had demonstrated some stability or improvement in their symptoms and functioning. In the past, young people recruited at this stage of their mental health condition were well enough to cope with the assessment of trauma symptoms but still presented with a wide variability in symptomatology.

6.3.1 Inclusion/exclusion Criteria

Formal inclusion and exclusion criteria were also established. Eligibility for the study required the participant to have a Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition- Text Revised (DSM-IV-TR, American Psychiatric Association, 2000) diagnosis of either a psychotic disorder or an affective disorder with psychotic features. The exclusion criteria included inability to speak English, inability to provide informed consent, and/or evidence of significant intellectual impairment (i.e., IQ < 70).

6.3.2 Description of the Sample

Of the 70 participants recruited, four completed less than 50% of the overall assessment and therefore their results were discarded from all analyses. The final sample size included in the analyses was $n = 66$. Overall, males comprised 42% of the sample ($n = 28$); females, 55% ($n = 36$) and 3% ($n = 2$) identified as female-to-male transgender. The mean age of the participants was 20.18 years ($SD = 2.69$). Diagnoses for the sample were based on DSM-IV-TR criteria. The majority of the sample met criteria for a psychotic disorder (83%) while 17% presented with an affective disorder with psychotic features. The most common diagnosis was schizoaffective disorder (29%).

Additional demographic and diagnostic information for the sample are presented in Table 6.1 on the following page.

Table 6.1

Demographic and diagnostic information for the sample (n = 66).

Descriptive		
Mean age (Standard deviation)	20.18 years ($SD = 2.69$)	
	n	Percentage (%)
Born in Australia	59	89.4
Gender identification		
Male	28	42.4
Female	36	54.5
Transgender	2	3.0
Ethnicity		
Caucasian	46	69.7
Asian	4	6.1
African	3	4.5
Indigenous Australian/Pacific Islander	5	7.6
Other	8	12.1
Occupational status		
Not working/studying	25	37.9
Part-time work/study	22	33.3
Full-time work/study	19	28.8
Primary diagnosis		
Schizophrenia	12	18.2
Schizoaffective	19	28.8
Psychotic disorder NOS	9	13.6
Brief psychotic disorder	2	3.0
Schizophreniform	5	7.6
Delusional disorder	2	3.0
Substance-induced psychotic disorder	6	9.1
Bipolar I disorder with psychotic features	10	15.2
Major depressive disorder with psychotic features	1	1.5
Personality disorder		
Borderline personality disorder	5	7.6
Medication use in last 6 months		
Antipsychotic	40	60.6
Antidepressant	12	18.2
Mood stabilizer	3	4.5
Other	1	1.5
No medication	10	15.2
Family history of mental illness		
Present	39	59.1
None	15	22.7
Unknown	12	18.2
First degree relative with severe mental illness	8	12.1

6.4 Measures

6.4.1. Demographics

Demographics Questionnaire

The demographics questionnaire was created by the researchers. The questionnaire included items for age, gender, living arrangements, occupation, medication usage, other health information and family history of mental illness (see Appendix D).

6.4.2 Diagnostic Measures

Structured Clinical Interview for DSM-IV Axis I Disorders – Patient Edition (SCID-I/P; Psychosis and Mood Modules),

The SCID-I is a semi-structured interview measure used to diagnose the presence of DSM-IV axis I disorders (First, Spitzer, Gibbon, & Williams, 1996). Assessment questions are derived from DSM-IV diagnostic criteria for psychiatric disorders. Zanarini and colleagues (2000) examined the inter-rater and test-retest reliability of the SCID-I for DSM-IV. Inter-rater reliability was assessed using 84 rater pairs, for the ten most frequently diagnosed Axis I disorders in their sample, median inter-rater kappa (κ) scores ranging from .57 (good agreement) to 1.0 (excellent agreement) were demonstrated. Six of these ten disorders showed excellent median inter-rater κ values (Zanarini et al., 2000). Similar inter-rater reliability values for the DSM-IV version of the SCID-I were found in a study that utilized 16 first raters and 14 second raters of 151 diagnostic cases (Lobbestael, Leurgans, & Arntz, 2011). Inter-rater agreement was calculated for 12 SCID-I diagnoses. The κ values ranged from .61 (fair-good) to .83 (excellent), with a mean κ of .71 (fair-good). Half of the disorders were found to have fair-good inter-rater agreement, and the other half demonstrated excellent inter-rater reliability (Lobbestael, et al., 2011). Test-retest reliability was assessed using two direct interviews of 52

participants with a test retest interval of seven to ten days. Test-retest κ scores varied from .35 (poor) to .78 (excellent). Only one disorder (dysthymia) demonstrated poor test-retest reliability, three disorders showed excellent test-retest κ values and the test-retest κ scores for the remaining seven disorders fell in the fair-good range (Zanarini et al., 2000).

In our study, only the mood and psychotic disorder modules were utilized to establish the presence of a primary psychotic or affective disorder diagnosis.

Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II; Borderline and Antisocial Personality Disorder Modules)

In the current study, the SCID-II was used to diagnose the presence of borderline and/or antisocial personality disorder (PD). The SCID-II is a semi-structured interview measure used to diagnose DSM-IV Axis II, personality disorders (First, Gibbon, Spitzer, Williams, & Benjamin, 1997). The assessment questions are based on the diagnostic criteria for personality disorders set in the DSM-IV. Three separate studies have reported the inter-rater reliability of the DSM-IV version of the SCID-II and all three found κ values ranging from fair-good to excellent inter-rater agreement (Lobbestael, et al., 2011; Maffei, et al., 1997; Zanarini et al., 2000). In terms of Borderline PD, inter-rater κ scores of .68 (fair-good) was found by Zanarini et al., (2000) and a κ value of .91 (excellent) was found in both Lobbestal, et al., (2011) and Maffei et al., (1997). Antisocial PD κ values were 1.0 (Zanarini, et al., 2000), .95 (Maffei et al., 1997) and .78 (Lobbestael et al., 2011). Test-retest reliability following a seven to ten-day test interval demonstrated a κ value of .69 for borderline PD and .70 for antisocial PD, indicating good overall test-retest reliability (Zanarini et al., 2000). Internal consistency of the SCID-II was also examined using a maximized Cronbach's α and the overall SCID-II was shown to have satisfactory internal consistency coefficients (.71 to .94) with a coefficient of .86 for borderline PD and .93 for antisocial PD (Maffei, et al., 1997).

6.4.3 Psychotic Symptom Measures

Positive and Negative Syndrome Scale (PANSS)

The PANSS (Kay, Fiszbein, & Opler, 1987) is a widely utilized, 30-item interviewer rated measure that assesses the presence (within the last fortnight) of both positive (e.g. delusions, hallucinatory behavior) and negative psychotic symptoms (e.g. blunted affect, emotional withdrawal) as well as general psychopathological symptoms such as depression, anxiety, somatic concerns etc. The interview takes approximately 30-40 minutes to complete and information is gathered on the presence and the severity of the various symptoms. The items are rated on a 7-point rating scale from 1 = absent to 7 = extreme. The PANSS is scored by summing item ratings across the positive and negative subscales, (both with a potential score range of 7-49) as well as the general psychopathology scale (potential score range 16-112). A composite score can also be derived by subtracting the negative symptoms scale score from the positive scale score. The composite score provides information regarding the dominance of either the positive or negative syndrome in a particular person. Raw scores are converted to percentile ranks. In its initial development, an internal reliability analysis of the PANSS was conducted on its various scales and items. Overall α coefficients of .73, .83, and .79 were found for the positive, negative and general psychopathology scales respectively (Kay, Fiszbein, & Opler, 1987). In an examination of test-retest reliability after a period six months, Pearson correlations of $r = .80$ (positive scale), $r = .68$ (negative scale), $r = .66$ (composite) and $r = .60$ (general psychopathology scale) were found (Kay, Fiszbein, & Opler, 1987). Further studies of the psychometric properties of the PANSS have reported inter-rater reliability across the subscales, with an average Pearson r of .83, .85, and .87 for the positive, negative and general psychopathology scales respectively and a r of .84 for the composite (Kay, Opler, & Lindenmayer, 1988). Results from Kay and colleagues (1988) also supported the criterion-related validity of the PANSS when compared with the Scale for the Assessment of Positive

Symptoms (SAPS) (Andreasen, & Olsen, 1982), the Scale for the Assessment of Negative Symptoms (SANS) (Andreasen, 1982) and the Clinical Global Impressions Scale (CGI) (Guy, 1976). A strong correlation of $r = .77$ was found both for the positive scale of the PANSS with the SAPS and for the negative scale of the PANSS and the SANS. A correlation of .52 was found between the CGI and the general psychopathology scale of the PANSS (Kay, Opler, & Lindenmayer, 1988).

For the current study, scores on the hallucinations subscale as used as an index of hallucinatory experiences. In line with previously published research, scores on the delusions and suspiciousness subscales of the PANSS were totaled to quantify delusional experiences (e.g., Bendall, Hulbert, Alvarez-Jimenez, Allott, & McGorry, 2013).

6.4.4 Trauma Measures

Childhood Trauma Questionnaire- Short Form (CTQ)

The CTQ is a 28-item, self-report inventory of childhood emotional (e.g., "people in my family said hurtful or insulting things to me"), sexual (e.g., "someone molested me") and physical abuse (e.g., "I got hit or beaten so badly that it was noticed by someone like a teacher, a neighbor or doctor") as well as emotional (e.g., "my parents were too drunk or high to take care of the family") and physical neglect (e.g., "I didn't have enough to eat"). The CTQ also includes 3 items that assess minimization/denial and these can be used to detect false negative reports of trauma. The CTQ is designed to capture single instances of trauma as well as prolonged, multiple traumas. Responders rate each item on a 5-point Likert scale, with higher scores indicating a higher degree of traumatic experience. The scale has demonstrated good criterion validity as well as measurement invariance across four different sample groups (Bernstein et al., 2003). Furthermore, good criterion-related validity was shown in a subsample of adolescents for whom corroborative information was available. The latent maltreatment

variables of the CTQ significantly predicted analogous observational ratings by the therapists of abuse and neglect. This precision in correspondence supports the convergent and discriminant validity of the CTQ (Bernstein et al., 2003). High internal consistency, (Cronbach's α = .89) and test-retest reliability for an interval of four weeks, (Spearman's ρ = .75) was reported for the CTQ in a sample of 100 Korean participants diagnosed with schizophrenia (Kim, Bae, Han, Oh, & MacDonald, 2013).

The extent of maltreatment for each subtype of abuse or neglect can classified as none, low, moderate or severe based on a set of validated threshold scores outlined in the manual (Bernstein & Fink, 1998). In the current study, participants were counted as experiencing abuse or neglect if their score on any CTQ subscale fell in the moderate to severe range. For the data analyses, a total CTQ score for each participant was created by adding their scores on all five subtypes of trauma.

6.4.5 Dissociation Measures

Dissociative Experiences Scale-II (DES-II)

The DES-II is a 28 item self-report measure that is frequently used as a screening tool for dissociative experiences and disorders in both clinical and non-clinical populations (see Appendix E). It consists of 3 subscales: amnesia, depersonalization/derealization and absorption (Bernstein, & Putnam, 1986). Participants rate each item on a scale of 0-100. The ratings for each item are totaled and then divided by the total number of items. Various cut-offs have been used in the research literature. In general, a score of 20 or above indicates elevated levels of dissociative experience. Scores greater than 30 generally suggest the presence of a dissociative disorder, and scores of 10 or less indicate low dissociation (e.g. van Ijzendoorn, & Schuengel, 1996). In its original development, Bernstein and Putnam (1986) found that the DES score had a test-retest reliability coefficient of .84. Similar test-retest

reliability (correlation coefficient .93) for the DES score following a two-week interval was reported (Dubester, & Braun, 1995). The test-retest reliability coefficients for each subscale: amnesia, depersonalization/derealization and absorption were .95, .89 and .82 respectively. Temporal stability of the test total score and subscale scores was demonstrated over a two-week period (Dubester, & Braun, 1995) as well as a four-week interval (Frischholz, et al., 1990). In the development of the DES, the split-half reliability method was used to measure internal reliability. For a sample of participants with schizophrenia, a split-half reliability coefficient of .93 was found using the Spearman-Brown formula (Bernstein, & Putnam, 1986). Overall, high internal consistency has been found with the DES, a meta-analysis of 16 studies reported a mean α reliability of .93 (van Ijzendoorn, & Schuengel, 1996).

The DES has medium to strong convergent validity with a number of similar questionnaires: the Perceptual Alteration Scale (PAS; Sanders, 1986) ($r = .63$, Cohen's $d = 1.64$), the Tellegen Absorption Scale (TAS; Tellegen, & Atkinson, 1974) ($r = .54$, Cohen's $d = 1.30$), and the Questionnaire of Experiences of Dissociation (QED; Riley, 1988) ($r = .80$, Cohen's $d = 2.68$) as well as interview-based measures: the SCID-D (Steinberg, 1994) ($r = .76$, Cohen's $d = 2.33$) and the Dissociative Disorders Interview Schedule (DDIS; Ross, Heber, Norton, Anderson, Anderson, & Barcher, 1989) ($r = .68$, Cohen's $d = 1.83$). Bernstein and Putnam (1986) found evidence for the criterion-referenced concurrent validity of the DES. They performed a Kruskal-Wallis test and pair-wise comparisons to examine DES scores across various groups. The item scores were able to discriminate between those with or without a clinical diagnosis of a dissociative disorder as well as between different diagnostic groups and controls. Those with DID had significantly higher median scores on the DES than all the other groups (Bernstein, & Putnam, 1986). Frischholz et al., (1990) reported significant differences in mean scores on the DES between groups with DID, DDNOS and student

controls. As expected, those with DID scored significantly higher on the DES than those with DDNOS and controls. Those with DDNOS had higher scores than the controls.

In accordance with previous research (Perona-Garcelán, Carrascoso-López et al., 2012; Longden, et al, 2016; Varese, Barkus et al., 2012), the present study removed question 27 of the DES-II (voice-hearing), which is seen as an overlapping item from the scoring and subsequent analyses. Item 27 was removed for both the total DES-II score and scores on the depersonalization/derealization subscale. A total DES-II score as well as scores for the amnesia, depersonalization/derealization and absorption subscales were calculated using the scoring guidelines.

Structured Clinical Interview for DSM-IV Dissociative Disorders-Revised (SCID-D-R)

The SCID-D-R was developed by Steinberg (1995) and it is suitable for use in adolescents (Steinberg, & Steinberg, 1995), adults (Steinberg, 2000) as well as forensic populations (Steinberg, Hall, Lareau, & Cicchetti, 2001). The SCID-D has been described as the 'gold standard' in assessing dissociative symptoms and disorders (Welburn et al., 2003). SCID-D-R is a semi-structured diagnostic interview that systematically assesses the severity of five core dissociative symptoms (i.e., amnesia, depersonalization, derealization, identity confusion, and identity alteration). The character, frequency and severity of dissociative experiences are assessed with open-ended and individualized follow-up questions. Diagnosis for dissociative disorders is based on criteria outlined in the DSM-IV (Steinberg, 1994). Since the introduction of the DSM (5th ed.; DSM-5; American Psychiatric Association, 2013) there have been several changes to the diagnostic criteria for a number of dissociative disorders. These alterations include: (1) depersonalization disorder is now referred to as *depersonalization/derealization disorder* and includes the symptom of derealization in the symptom structure, (2) dissociative fugue is no longer a separate diagnosis, rather it is now a

specifier of dissociative amnesia, and (3) the criteria for DID has been changed, symptoms of identity disruption may be reported as well as observed, and that inability to recall certain events may occur for everyday memories and not just traumatic ones. Additionally, identity disruption now includes experiences of pathological possession found in some cultures (American Psychiatric Association, 2013). Despite these changes, the assessment of the dissociative symptoms in regards to the phenomenology itself has not changed. Therefore, the symptoms of dissociation and dissociative disorders can still be assessed with the SCID-D-R.

Numerous studies across several countries have reported good to excellent inter-rater and test-retest reliability. Steinberg, Rounsaville & Cicchetti (1990) reported test-retest reliability for the presence of dissociative disorders ($\kappa = .88$), inter-rater reliability for the types of dissociative disorders ranged from ($\kappa = .72$ to $.86$), temporal reliability (at baseline, 2 weeks and 6-month follow-up), for both the presence and extent of dissociative symptoms ranged from ($\kappa = .77$ to $.86$). Several studies have also documented the discriminant validity of the SCID-D-R and its effectiveness in differentiating between dissociative disorders and other psychiatric conditions (Goff, Olin, Jenike, Baer, & Buttolph, 1992; Steinberg et al., 1994; Steinberg, Hall, Lareau, & Cicchetti, 2001). When compared to people with schizophrenia-spectrum disorders, those with DID scored significantly higher on each of the five dissociative symptom areas as well as the total SCID-D score. Further comparisons of the two groups revealed that those with DID had a mean score of 4 (severe or persistent symptoms) across all five symptom areas. By contrast, those in the schizophrenia-spectrum group scored consistently below 3 (none-mild/less than 3 episodes of symptoms) for the same five symptom areas. The frequency of moderate-severe (recurrent-persistent) symptomatology could differentiate those with DID and those diagnosed with a schizophrenia-spectrum disorder (Steinberg et al., 1994).

When compared to other measures of dissociation such as the DES, the SCID-D was the most efficacious at discriminating between those with DID, schizophrenia and those feigning a dissociative disorder (Welburn et al., 2003). Both those with schizophrenia and feigners scored significantly lower on SCID-D symptom severity compared with the DID group. However, when using the DES, which is a self-reported measure of dissociation, no significant difference in self-reported levels of dissociative experiences between the DID and the feigning group were indicated. Those with schizophrenia self-reported less dissociative experience compared with the DID group. Therefore, it appears that the use of a clinician-rated instrument resulted in an improved ability to discriminate between the three groups based on the severity of dissociative symptoms (Welburn et al., 2003).

The SCID-D was also more accurate in classifying the groups based on whether they met the diagnostic criteria for a dissociative disorder. Results indicated that 100% of those in the DID group were correctly identified as having a dissociative disorder when using the SCID-D compared to 83% when using a DES cut-off score of > 30. Additionally, when using the SCID-D, 0% of the feigners were classified as having a dissociative disorder compared to 50% when using the DES with a cut-off score of > 30. When utilizing the SCID-D and the DES (with a cut-off score of > 30), 11% of the group with schizophrenia were identified as having a dissociative disorder (Welburn et al., 2003). Compared with the DES, the SCID-D appears to be more accurate at classifying those with a dissociative disorder, especially for those who may be feigning their symptoms.

In the current study, a total SCID-D-R score was calculated by summing up scores on all 5 subscales. Scores on the amnesia, identity confusion and identity alteration subscales were added to derive the compartmentalization variable and scores on the depersonalization and derealization subscales were summed to represent the detachment variable. In cases where

participants reported that their dissociative symptoms occurred exclusively with drug and/or alcohol use and at no other times, scores were recoded as 0 for the data analyses.

6.5 Procedure

6.5.1 Participant Recruitment

The researchers P.S. and N.P. regularly attended clinical meetings of the EPPIC case managers to raise awareness of the study and to invite case managers to refer their clients. In addition, case managers were individually contacted in person and by phone to assess the eligibility of their new and existing clients to participate in the research study and to request permission to contact clients where appropriate. All participants were recruited through their EPPIC clinicians. Participants were recruited from May 2014 to February 2016.

An amended method of recruitment was implemented in conjunction with that outlined above. Researchers liaised with administrative staff to obtain a list of current EPPIC clients on the Orygen Continuing Care Team (CCT) database and the case manager to which the client had been assigned. During the recruitment phase, the list was updated approximately every two to three months. The researchers would contact individual case managers and inquire about the suitability of each client on their list for the study based on the inclusion and exclusion criteria. Case managers would decide whether the client on the list was eligible for participation in the study and indicated this by saying "yes" or "no" to whether the client named could be contacted for the study. If a case manager believed that the client did not meet the inclusion criteria or there were other clinical issues that prevented the client from being contacted, the case manager would then indicate this to the researcher by declining the request to contact. Case managers were not required to disclose to the researcher the reason/s why a client could not be contacted. The name/s of the clients who might be interested and eligible to participate

were then retained and a method of contact was confirmed by the case manager. The case list was then shredded or disposed in a protected bin for confidential information located on OYH premises.

6.5.2 Obtaining Informed Consent

Upon referral to the study, P.S. or N.P. would phone the participant and arrange a meeting to provide them with a full verbal explanation of the purpose and procedures of the study as well as a hard-copy of the plain language statement included with the Participant Information and Consent Form (PICF). See Appendix F for a copy of the PICF for individual consent.

During the process of obtaining informed consent, issues of confidentiality and privacy were discussed with participants. Permission for the researcher to communicate information obtained in the interview to the participants' case manager was sought and all participants consented to this disclosure. The limits to confidentiality were also discussed with each participant and it was clearly explained that should the interviewer believe that the participant or another identified person was at risk of harm, confidentiality may be breached.

How personal information and data would be treated and stored was also communicated to each participant. All paperwork would be stored onsite at OYH in locked, filing cabinets. Documents with personal, identifying information would be kept in a separate filing cabinet from completed study materials. Each participant was given a number code and these were used instead of names to track interview schedules and questionnaires. The same participant codes were used in a password-protected, electronic database for storage and data analyses.

Participants were further informed that they are under no obligation to take part in the study and their decision to participate or not would not affect their clinical treatment. If a client was at least 18 years old, judged to understand the terms of the study and agreed to participate,

they were asked to sign the PICF. Each participant received a copy of the PICF for his or her personal records.

For those participants under the age of 18, wherever possible, parental or guardian consent, in addition to their own consent was sought (see Appendix G for parent/guardian PICF). Where the young person was either estranged from their parents, had no legal guardian or was geographically removed from their parent/s in such a way as to make obtaining parental consent impractical, the concept of the rational minor was used to determine the ability of the young person to provide consent for him or herself.

6.5.3 Assessment and Data Collection

At the time of the study, the interviewers P.S and N.P were doctoral candidates completing combined research and training degrees in clinical psychology. Before the commencement of the study, the interviewers were trained by supervisor S.B to administer and rate the semi-structured interviews (i.e., SCID-I, SCID-II, SCID-D-R and PANSS). Through training, the interviewers learnt how to recognize and assess psychotic and dissociative symptoms and how to make informed diagnoses. S.B is an experienced clinical psychologist and researcher with over 20 years of experience. Her work over the last 15 years has focused on trauma assessment and treatment of young people with early psychosis who experience co-occurring posttraumatic stress and dissociative symptoms and disorders. For each semi-structured instrument, the interviewers initially rated case studies and discussed their scoring, ensuring that there was overall consensus in how case presentations were rated. For the duration of the recruitment and assessment phase, P.S and N.P attended regular supervision sessions with S.B to discuss complex cases and how these should be diagnosed and rated on the semi-structured measures.

The research assessment consisted of semi-structured interviews and the completion of several self-report questionnaires. The total assessment time was approximately three hours, and participants were given the option to complete the interview over two sessions. Participants were informed that they could take breaks when required. At the end of the session the participants were given the opportunity to ask questions and provide feedback. All participants were reimbursed $40.00 to cover their time and travel expenses.

6.6 Data Analysis

6.6.1. Study Design and Power Analysis

The study utilized a retrospective, cross-sectional approach. In preparing for the study, power analyses were conducted to determine the required sample size to detect an effect. According to the available evidence at the time of study design, in a meta-analysis of 38 studies, that investigated childhood trauma and its association with dissociation, an overall weighted r estimate of .32 was reported (Dalenberg, et al., 2012). According to Cohen (1992) this suggested a moderate effect size. A previous study examining the relationship between dissociation and positive psychotic experiences reported $r = .58$ for hallucinations and $r = .29$ for delusions (Perona-Garcelán, Carrascoso-López et al., 2012). Overall, this suggested a moderate relationship between these positive symptoms of psychosis and dissociation. Setting alpha at 0.05 and power ($1-\beta$) at 0.80, a sample size of 64 was required to detect a correlation of medium effect size. Therefore, in accounting for the possibility of attrition, it was determined that at least 70 participants would be recruited for the study.

6.6.2 Analyses

All data was entered into a Statistical Package for the Social Sciences (SPSS) for Windows (IBM Corp., 2013) database, and all statistical analyses were performed using SPSS. The data was tested for skewness and kurtosis through inspection of the distribution plots of the continuous variables and with the Shapiro-Wilk test. Many of the variables were positively skewed. In an attempt to correct for this skewness, the variables were transformed using a variety of methods including square root, log and reciprocal transformations, however, none of these transformations were successful in normalizing the data. Therefore, non-parametric tests, (e.g., Spearman's rho (ρ)) or boot-strapping techniques were used on the untransformed data where appropriate. Bootstrapping is considered to be a robust method that can overcome violations of assumptions, such as non-normally distributed data (Bollen & Stine, 1990; Field, 2013). In a preliminary examination of the data, descriptive statistics such as frequencies, ranges, means and standard deviations of the demographic variables were calculated to characterize the sample and examine trends in the data. There were no missing items and no outliers were present in the data as all cases had z scores under 3.29, $p < .001$ (Tabachnick & Fidell, 2007).

6.6.2.1 Aim One

The prevalence of dissociative disorders as well as clinically significant symptoms (defined as symptoms rated as moderate or severe) were calculated through frequency counts and expressed as numbers and percentages. A chi-square test was performed to determine whether the frequency of dissociative symptoms rated as moderate to severe on the SCID-D-R was significantly greater in groups with a history of childhood trauma compared with a no trauma history group. For the analyses, two-tailed significance tests were employed with alpha set at 0.05.

6.6.2.2 Aim Two

Non-parametric bivariate analyses were used to test the correlations between dissociation (total SCID-D-R score), childhood trauma (total CTQ) and hallucinations (PANSS-hallucinations subscale) and delusions (total of PANSS-delusions and PANSS-suspiciousness/persecution subscales). The criteria outlined in Cohen (1992) was used to interpret the strength of the relationship based on the size of correlation coefficients.

To examine whether dissociation mediated the relationship between childhood trauma and hallucinations and childhood trauma and delusions, two simple mediation analyses were conducted using the PROCESS macro version 2.16, available for SPSS (see Hayes, 2013 for documentation). Mediation was determined by examining the statistical significance of the indirect effect (a × b) of the independent variable (IV) via the mediator (M). The indirect effect is quantified as the product of the effect of the IV on M (a), and the effect of M on the dependent variable (DV), with the effect of the IV partialled out (b). According to Preacher and Hayes (2004), mediation occurs if (1) there is an effect to be mediated (i.e., the IV predicts the DV, direct effect, (c) ≠ 0) and (2) the indirect effect (a × b) is statistically significant, and occurs in the hypothesized direction.

PROCESS was applied to estimate the non-standardized model coefficients, standard errors and *p*-values utilizing ordinary least squares regression. It was further used to generate a bias corrected and accelerated (BCa) 95% bootstrap confidence interval (CI) for the indirect effect using 5000 bootstrap samples to calculate the significance of the mediation. Point estimates were considered significant at $p < .05$ if the BCa CI did not contain zero.

Given that the vast majority of studies have used a version of the DES to quantify dissociative experiences (Renard et al., 2017), we conducted a post-hoc, exploratory analysis using the DES-II (total score) as a way to compare our findings with previous research. The

same correlational and mediation design was utilized in this secondary analysis. All other variables were derived in the same manner as the primary analyses.

6.6.2.3 Aim Three

Correlational (non-parametric) analyses were used to test the relationship between compartmentalization (sum of scores on the amnesia, identity confusion and identity alteration subscales of the SCID-D-R) detachment (sum of scores on the depersonalization and derealization subscales of the SCID-D-R) and hallucinations (PANSS-hallucinations) and delusions (PANSS-delusions and suspiciousness/persecution). Given the exploratory nature of the third aim, the relationship between compartmentalization and detachment as well as the subscales of both the SCID-D-R and the DES-II, childhood trauma (i.e., CTQ) was also investigated through bivariate analyses. Given the substantial number of correlations conducted, to reduce the likelihood of Type I errors, the alpha value was adjusted using the Bonferroni correction method. An adjusted alpha level of $p < .001$ was used to test the significance of the correlations. Again, the criteria outlined in Cohen (1992) was used to interpret the strength of the relationship based on the size of the correlation coefficients.

Chapter 7. Investigating the Prevalence of Dissociative Symptoms and Disorders in FEP

7.1 Preamble to Manuscript One

The first paper of the thesis entitled 'Investigating the Prevalence of Dissociative Disorders and Severe Dissociative Symptoms in First Episode Psychosis' is presented in this chapter. This paper investigated the prevalence of dissociative disorders and clinically significant symptoms of dissociation in those with early psychosis. In addition, it compared the frequency of clinically significant dissociative symptoms between groups with and without a history of trauma. The majority of prevalence studies to date have been conducted on those with chronic schizophrenia and there is a scarcity of studies that have examined the prevalence of dissociative disorders and symptoms in a FEP cohort. The substantial prevalence of clinically-significant dissociative symptoms, especially in those with a history of childhood trauma found in this study has significant implications for how dissociation should be assessed and managed in early psychosis settings.

This paper has been accepted for publication in *Early Intervention in Psychiatry* and is currently in press. *Early Intervention in Psychiatry* is a peer-reviewed journal that focuses on research dealing with the early detection, diagnosis and treatment of a full range of mental and substance use disorders. *Early Intervention in Psychiatry* reportedly has an impact factor of 2.92.

The presentation of this chapter is consistent with the manuscript submission requirements for *Early Intervention in Psychiatry,* including the use of UK spelling, set manuscript structure and referencing style.

7.2 Declaration for Manuscript One

<div align="center">

Monash University

Declaration for Thesis Chapter 7, Manuscript One

</div>

Declaration by candidate

In the case of Chapter 7, the nature and extent of my contribution to the work was the following:

Nature of contribution	Extent of contribution (%)
Conceptualized and designed the study, data collection and analysis, wrote first and subsequent drafts of the manuscript incorporating feedback from co-authors.	**75%**

The following co-authors contributed to the work.

Name	Nature of contribution
A/Prof Mario Alvarez-Jimenez	Assistance with initial design of the paper, provided feedback on drafts.
Dr Katherine Lawrence	Assistance with providing feedback on drafts
Dr Katrina Simpson	Assistance with providing feedback on drafts
Dr Natalie Peach	Assistance with data collection and data entry. Feedback on drafts.
Dr Sarah Bendall	Guidance with the scope, aims and conceptual design of the paper. Feedback on drafts of the manuscript.

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work*.

Candidate's Signature		Date 23/11/18

Main Supervisor's Signature		Date 23/11/18

*Note: Where the responsible author is not the candidate's main supervisor, the main supervisor should consult with the responsible author to agree on the respective contributions of the authors.

Title

Investigating the Prevalence of Dissociative Disorders and Severe Dissociative Symptoms in First Episode Psychosis

Running Title

Dissociative Symptoms & Disorders in FEP

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Abstract

Aim. Increasing evidence suggests childhood trauma and dissociation are associated with psychotic symptoms and disorders. Significant rates of dissociative disorders and clinical levels of dissociative symptoms are found in chronic schizophrenia. To date, no studies have examined the prevalence of these in a first episode psychosis (FEP) group. This study aimed to investigate the prevalence of dissociative disorders and symptoms in a FEP sample as well as the prevalence of severe dissociative symptoms in those with or without experiences of childhood trauma.

Methods. Sixty-six young people with FEP completed a research interview which included the Structured Clinical Interview for DSM-IV Axis I Disorders, Childhood Trauma Questionnaire and the Structured Clinical Interview for DSM-IV Dissociative Disorders-Revised.

Results. Dissociative symptoms at clinical levels were found in 36.4% of the sample. Furthermore, 13.6% of the sample met diagnostic criteria for a lifetime dissociative disorder. Significant differences in the frequency of clinical dissociative symptoms between those with or without childhood trauma were also found.

Conclusions. Dissociative symptoms should be routinely assessed for in early intervention settings, especially in cases where childhood trauma is disclosed or suspected. Where present, dissociative symptoms should also be incorporated into subsequent case formulation and treatment planning.

Introduction

Traumatic experiences in childhood are now an acknowledged risk factor for psychotic

symptoms and disorders (Bailey, Alvarez-Jimenez, Garcia-Sanchez, Hulbert, Barlow & Bendall, 2018; Varese, Smeets, et al., 2012). In those with a psychotic disorder, associations between dissociative experiences and childhood adversity is a common finding (Braehler et al., 2013; Ross & Keyes, 2004; Sun, Alvarez-Jimenez, Simpson, Lawrence, Peach & Bendall, 2018). Those with psychosis and a history of childhood trauma experienced significantly more severe dissociative symptoms on a self-report measure of dissociation than those without a trauma history (Perona-Garcelán et al., 2010). In research and clinical settings, dissociation has been operationalised as a disruption in the normally integrated functions of consciousness, memory, identity, cognition or perception (American Psychiatric Association (APA), 2000). Several studies have reported associations between psychotic symptoms and dissociation – particularly positive symptoms (Lysaker & LaRocco, 2008; Perona-Garcelán et al., 2012; Perona-Garcelán et al., 2010; Schäfer et al., 2012). However, the rates of severe dissociative symptoms and diagnosable dissociative disorders in those with psychosis, particularly early psychosis are less well-documented. Improving our understanding of the prevalence of dissociative symptoms and disorders in groups with psychosis has potential implications for how dissociation is assessed and managed in clinical settings.

A number of authors have suggested an overlap between groups with psychotic and dissociative disorders (Ross, 2009; Gainer, 1994). In several early studies of those with dissociative identity disorder (DID), between 16% and 50% of participants had a prior diagnosis of a schizophrenia spectrum disorder based on case notes by treating clinicians (Putnam et al., 1986; Ross et al., 1989; Ross et al., 1990; Boon & Draijer, 1993). When using the Structured Clinical Interview for DSM-III-R, one study found that approximately 74% of the DID sample met diagnostic criteria for a psychotic disorder (Ellason et al., 1996). People with DID were shown to experience more Schneiderian first-rank symptoms such as voices arguing or commenting, thought insertion, withdrawal or broadcasting, delusional perceptions,

made actions and somatic passivity than those with schizophrenia (Ellason & Ross, 1995; Laddis & Dell, 2012; Ross et al., 1990). Furthermore, Dorahy and colleagues (2009) compared the phenomenological characteristics of hallucinations between groups with DID, schizophrenia with a history of trauma and schizophrenia with no trauma history. When compared to either group with schizophrenia, those with DID were more likely to report voices that started before the age of 18, more than two voices, both child and adult voices and more visual, tactile and olfactory hallucinations (Dorahy et al., 2009). Overall, these findings suggest that there is a significant co-occurrence between dissociative and psychotic symptoms and disorders.

Fewer studies have examined the rates of dissociative disorders in those with schizophrenia. When utilising a clinician-administered tool of dissociation such as the Dissociative Disorders Interview Schedule (DDIS) or the Structured Clinical Interview for DSM-IV Dissociative Disorders (SCID-D), the prevalence of dissociative disorders in outpatients with schizophrenia spectrum disorder, range from 9% to 50% (Haugen & Castillo, 1999; Moise & Leichner, 1996; Ross & Keyes, 2004; Steinberg, Cicchetti, Buchanan, Rakfeldt & Rounsaville 1994). Many outpatients with psychosis experience clinical levels of dissociative symptoms on the SCID-D such as amnesia (34% to 57%), depersonalisation (48% to 57%), derealisation (22% to 43%), identity confusion (46%), identity alteration (32% to 56%) (Haugen & Castillo, 1999; Steinberg et al., 1994). A similar prevalence of dissociative disorders (15%) was found in adult inpatients with schizophrenia when utilising the DDIS (Yu et al., 2010). For many individuals, these dissociative symptoms and disorders were unrecognised prior to the study (Haugen & Castillo, 1999; Yu et al., 2010).

The majority of these prevalence studies have examined adults with chronic schizophrenia. To our knowledge, no studies have investigated the rates of dissociative disorders and clinically significant dissociative symptoms in first-episode psychosis (FEP)

using a clinician-rated measure. In the one study which compared FEP with chronic schizophrenia, the chronic group reported significantly higher levels of dissociation as measured on the Dissociative Experiences Scale (DES) than FEP (Braehler et al., 2013). Therefore, the prevalence of dissociative disorders in groups with chronic schizophrenia may also be higher than FEP. However, due to the use of the DES, which is designed as a screening tool for dissociative experiences and provides limited information for diagnosing dissociative disorders and clinical symptoms (Draijer & Boon, 1993) diagnostic rates were not reported in Braehler and colleagues' (2013) study. Gaps in knowledge regarding the prevalence of dissociative symptomatology in FEP means there may be a subgroup of those with early psychosis who have unmet mental health needs.

The primary aim of the study was to investigate the prevalence of dissociative disorders and clinical levels of dissociative symptoms utilising a semi-structured, clinician-administered measure of dissociation in a FEP group. The secondary aim was to compare the prevalence of clinical dissociative symptoms in groups with or without a history of childhood trauma. Symptoms rated as moderate/severe on the SCID-D-R represent 'high symptomatology' and dissociation that is recurrent and persistent (Steinberg et al., 1994). It was hypothesised that a group with childhood trauma will have a significantly greater prevalence of dissociative symptoms rated as moderate to severe on the SCID-D-R than a group with no trauma.

Method

Participants

Seventy participants were recruited, however, four participants completed less than 50% of the assessment and were excluded from the analysis, final sample size ($n = 66$). The average age of the participants was 20.18 ($SD = 2.69$) years.

The participants were recruited from the Early Psychosis Prevention and Intervention Centre (EPPIC) at ORYGEN Youth Health (OYH) and were referred by their case managers. OYH is a public mental health service for young people aged 15 to 25 years living in the Western and North Western regions of Melbourne, Australia. EPPIC is a clinical program providing ongoing case management, psychotherapeutic and medical care to eligible FEP clients.

The inclusion criteria were having a Diagnostic and Statistical Manual of Mental Disorders (4th ed. text revised; DSM-IV-TR; APA, 2000) diagnosis of a psychotic disorder or an affective disorder with psychotic features, fluency in English, the ability to provide informed consent or parental/guardian consent for participants under the age of 18 years. Those with significant intellectual disability or who showed evidence of organic brain disease were excluded. The socio-demographic and diagnostic characteristics of the sample are presented in Table 1.

[Table 1 About Here]

Measures

Structured Clinical Interview for DSM-IV Axis I Disorders - Patient Edition (SCID-I)

The SCID-I is a semi-structured interview measure used to diagnose the presence of DSM-IV axis I disorders (First et al., 1996). The SCID-I has demonstrated good inter-rater and test-retest reliability (Lobbestael et al., 2011). The SCID-I was used to establish primary diagnosis for the participants in the study.

Childhood Trauma Questionnaire- Short Form (CTQ)

The degree of childhood trauma was measured by the CTQ (Bernstein et al., 2003), which is a 28-item, self-report questionnaire that measures an individual's experience of abuse (physical, sexual and emotional) and neglect (physical and emotional) while growing up. The scale has demonstrated good criterion validity as well as measurement invariance across different sample groups (Bernstein et al., 2003). Participants whose scores on any CTQ subscale fell in the moderate to severe range were considered to be present for trauma.

Structured Clinical Interview for DSM-IV Dissociative Disorders-Revised (SCID-D-R)

The SCID-D-R (Steinberg, 1995) is a clinician-administered, semi-structured diagnostic interview that systematically assesses the severity of five core dissociative symptoms (amnesia, depersonalisation, derealisation, identity confusion, and identity alteration). The character, frequency and severity of dissociative experiences are assessed with open-ended and individualised follow-up questions. Diagnosis for dissociative disorders is based on criteria outlined in the DSM-IV. Numerous studies across several countries have reported good-to-excellent inter-rater and test-retest reliability (Steinberg et al., 1990). Where dissociative symptoms were associated with substance use only, scores on the relevant symptom subscale was recoded as 'absent'. The SCID-D-R was used to diagnose dissociative disorders in this study. Participants were counted as having clinical levels of dissociation if their score on any subscale was in the moderate or severe range. The symptom severity ratings were based on lifetime experiences.

Procedure

The Human Research and Ethics Committees associated with Melbourne Health, Monash University and The University of Melbourne granted ethical approval for this study. The current study formed part of a broader study which examined childhood trauma and trauma-related symptoms such as dissociation, posttraumatic intrusions and avoidance in the context of FEP.

At the time of the study, the interviewers Ms Pamela Sun and Dr Natalie Peach were doctoral candidates completing combined research and training degrees in clinical psychology. Before the commencement of the study, the interviewers were trained by supervisor Dr Sarah Bendall to administer the semi-structured interviews (i.e., SCID-I and SCID-D-R). Through training, the interviewers were taught how to recognise and assess psychotic and dissociative symptoms and how to make informed diagnoses. Dr Bendall is an experienced clinical psychologist and researcher with over 20 years of experience. Her work over the last 15 years has focused on trauma assessment and treatment of young people with early psychosis who experience co-occurring posttraumatic stress and dissociative symptoms and disorders. For each semi-structured instrument, the interviewers initially rated case studies and discussed their scoring, ensuring that there was overall consensus in how case presentations were rated. Furthermore, both interviewers received ongoing supervision with Dr Bendall to discuss complex cases and how these should be diagnosed and rated on the semi-structured measures (e.g., the SCID-D-R).

Prior to assessment, each participant received a plain language statement about the study and provided written consent to participate. Participants were reimbursed $40 to cover expenses associated with participation.

Participants completed the research assessment which included the clinician administered interviews (SCID-I, SCID-D-R), self-report questionnaires (CTQ) and answering basic demographic questions. The measures were rated and scored post-interview.

Data Analyses

All data was analysed using Statistical Package for the Social Sciences version 24. The prevalence of dissociative disorders and symptoms were calculated through frequency counts and expressed as numbers and percentages. Statistical hypothesis testing was conducted using chi-square and two-tailed significance testing was employed with alpha set at 0.05.

Results

Prevalence of dissociative disorders

Overall 13.6% of the sample met criteria for either a past or present diagnosis of a dissociative disorder. Dissociative disorder not otherwise specified (DDNOS) was the most commonly diagnosed current disorder (6%). No diagnosis of dissociative fugue or DID were made. A full list of dissociative disorders found in the sample is presented in Table 2.

The primary diagnosis most commonly found in those with a dissociative disorder was schizoaffective disorder (55.6%) followed by schizophrenia (33.3%), and psychotic disorder NOS (11.1%).

[Table 2 About Here]

Prevalence of dissociative symptoms

In the current sample, ($n = 24$, 36.4%) of participants had at least one dissociative symptom at moderate to severe levels on the SCID-D-R in their lifetime. Amnesia was the

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symptom most frequently reported at moderate to severe levels. The rates of elevated dissociative symptoms are presented in Table 3.

[Table 3 About Here]

Childhood trauma history in dissociative disorders

The difference in the prevalence of clinical dissociative symptoms (any SCID-D-R subscale rated as moderate or severe) in those with or without childhood trauma was significant ($\chi^2(1) = 17.99$, $p < .0001$). A cross tabulation of dissociative symptoms by childhood trauma is presented in Table 4.

[Table 4 About Here]

Discussion

The main findings of our study were that there was a subgroup within FEP who had a diagnosable dissociative disorder and experienced dissociative symptoms at moderate to severe levels. Our hypothesis that clinical levels of dissociation occur more frequently in groups with childhood trauma compared with no trauma was also supported. In studies that used the SCID-D to provide diagnoses, the average lifetime prevalence rates for dissociative disorders found in outpatients with schizophrenia spectrum disorder was 20% (Haugen & Castillo, 1999; Moise & Leichner, 1996; Steinberg et al., 1994). A prevalence of approximately 15% has also been reported in inpatients diagnosed with schizophrenia when utilising the DDIS (Yu et al., 2010). The lifetime prevalence of dissociative disorders in our sample although lower (13.6%) is comparable to previous research.

Our finding of differences in clinical dissociation between groups with or without a history of trauma is consistent with previous research which found significantly more dissociative experiences in those with psychosis and a history of trauma compared with no trauma (Greenfield, Strakowski, Tohen, Batson, & Kolbrener, 1994; Perona-Garcelán et al., 2010). Furthermore, it lends support to the theory that dissociation is as a potentially protective reaction to early traumatic events, which can then become generalised, problematic and ingrained (Terr, 1991).

In studies of outpatient groups with schizophrenia spectrum, average rates of dissociative symptoms reported at moderate to severe levels on the SCID-D-R were 46% for amnesia, 53% for depersonalisation, 33% for derealisation, 46% for identity confusion and 44% for identity alteration (Haugen & Castillo, 1999; Steinberg et al., 1994). These rates are generally higher than those reported in the current study (amnesia, 26%; depersonalisation, 21%; derealisation, 9%; identity confusion, 11% and identity alteration, 5%) with the largest differences found for identity related symptoms and disorders. These discrepancies could be due to differences in the clinical characteristics between FEP and chronic schizophrenia. For example, those with chronic schizophrenia are more likely to have experienced additional trauma and this may contribute to increased levels of dissociation (Braehler et al., 2013). Alternatively, due to the relatively small sample sizes of this ($n = 66$) and other comparable studies of outpatients with psychotic disorders, ($n = 50$; Haugen & Castillo, 1999) and ($n = 28$; Steinberg et al., 1994) the differences in the prevalence of dissociative symptoms could be due to sampling variability.

Approximately 36% of our sample experienced at least one dissociative symptom at clinical levels. Over a quarter of the sample had moderate to severe levels of amnesia. These episodes of psychogenic amnesia were mostly described as having 'blank spaces' or 'gaps' in memory, not being able to recall periods of time from hours to years, and no recollection of

activities and movements throughout the day. In some severe cases, a participant reported that their 'brain' blocked memories from them because it would be too painful if they ever 'cracked' it open and revealed the 'whole'. Another participant stated that they could not trust or believe in themselves and who they were because of missing memories. In most cases, descriptions of amnesia were able to be separated from the acute psychotic phase of the illness. However, some young people were unable to clearly recall whether their memory loss occurred in conjunction with or separately from acute psychosis.

Around 30% experienced one or both of depersonalisation and derealisation at moderate to severe levels. The most commonly reported experiences of depersonalisation included, watching the self from a point outside the body, going through the motions of living with the real self far away, being two separate people one going through the motions and one 'observing quietly' and feeling out of control, like a 'puppet'. For derealisation, the most frequently reported experiences were perceptual alterations in the external environment such as feeling like familiar surroundings, family and friends were strange or unreal. In the majority of cases young people were able to separate experiences of depersonalisation/derealisation from their psychotic symptoms such as delusional thinking or hallucinations. Many also reported that symptoms of depersonalisation/derealisation occurred outside of the acute psychotic phase.

Moderate to severe identity-related dissociative symptoms (i.e., identity confusion and identity alteration) were reported by approximately 15% of our FEP cohort. Commonly reported experiences included being told by others that the participant 'seemed like a completely different person', 'acting or feeling like a child' and the presence of an internal 'struggle' between various aspects of their personality and who they really were. While participants identified different aspects of their personality and described 'tensions' amongst

these, none of these identity states were particularly enduring or took over control of the person's actions.

This study had a number of limitations, firstly in a minority of cases, participants appeared to have difficulty recalling or describing incidences of dissociation and differentiating these from their psychosis. The semi-structured nature the SCID-D-R better allowed for these symptoms to be differentiated. Where dissociative symptoms are suspected but not adequately recalled or observed in the initial interview, additional assessment sessions may also be beneficial.

Secondly, the prevalence of dissociative disorders recorded in our study was lower than other studies. This is especially the case for DID as none of our sample met the DSM-IV-TR diagnostic criteria for the disorder. We cannot rule out the possibility of false negatives in our sample. The interviewers were both doctoral students who had completed several practicum placements at the time of the study. However, while they received training and ongoing supervision in rating the SCID-D-R from their supervisor who is a clinical psychologist with extensive experience in assessing and treating dissociative and other trauma-related symptoms in FEP; the relative inexperience of the interviewers may have meant that some cases of dissociative disorder were missed. Additionally, as part of the inclusion criteria, participants in our study were clinically 'stablised'. There is some suggestion that the severity of dissociation might vary depending on the phase of psychosis, with higher levels associated with the acute phase of psychosis compared to stablisation (Schäfer et al., 2012). Therefore, our inclusion criteria may have screened out potential participants with co-occurring dissociative symptoms and disorders leading to a lower prevalence rate.

Another limitation is the relatively small sample size. Future studies should recruit larger samples of FEP for a more representative view of the prevalence of dissociative disorders and dissociative symptoms. The inclusion of a healthy and/or clinical control group for

comparison might also be useful in future studies. Recruiting appropriate control groups can shed further light on whether the rates of dissociative disorders and symptoms are higher in groups with psychosis when compared with other diagnostic groups. This is especially important to establish given that some researchers question the categorical distinction between psychotic (i.e., schizophrenia) and dissociative disorders (i.e., DID) (Moskowitz, 2011; Ross, 2009).

The substantial prevalence of moderate to severe dissociative symptoms suggests that such symptoms should be routinely assessed in early psychosis services especially in cases where childhood trauma is suspected or known (Bendall et al, 2018; Tong et al, 2017). Clinicians should receive support to undertake these assessments as research indicates that they are often hesitant to assess for trauma-related symptoms without formal training and guidance (Gairns et al, 2015; Bendall et al, 2018).

Information regarding the phenomenology, course, frequency and intensity of dissociative symptoms should then be used in case formulation and subsequent interventions for service users (Bendall et al, 2018). The assessment of dissociation in those FEP and a history of trauma may be particularly important given studies in groups with posttraumatic stress disorder have shown that high dissociators demonstrate a differential response to treatment protocols compared with low dissociators, thus affecting the efficacy of standard trauma-focused treatments (Lanius, Brand, Vermetten, Frewen & Spiegel, 2012). The effectiveness of trauma-informed treatments for psychosis might similarly be affected if symptoms of dissociation are not addressed appropriately.

There is some evidence that those with dissociative disorders respond well to psychotherapeutic interventions and demonstrate a reduction in dissociation and other associated symptoms such as depression, anxiety, posttraumatic stress and general distress (Brand, Classen, McNary & Zaveri, 2009; Myrick et al., 2017). The effectiveness of an

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intervention targeting dissociative symptoms in those with psychosis and whether this leads to a decrease in symptoms and distress has not been trialled. Given the prevalence of severe dissociative symptoms found in this and other studies (e.g., Perona-Garcelán et al., 2010) further research into treatment approaches for those with dissociation and psychosis is warranted.

In conclusion, our study is the first to use a clinician-rated measure of dissociation to report rates of dissociative disorders and symptoms at clinical levels in a FEP cohort. The prevalence of dissociative disorders was lower but still comparable to those found in chronic schizophrenia samples. It was found that a significant proportion of the sample (36.4%) had experienced moderate to severe dissociative symptoms and such symptoms were significantly more prevalent in a group with childhood trauma compared with those with no trauma. These findings have implications for clinical practice and the management of trauma and dissociative experiences in an early psychosis setting. Clinicians should receive appropriate training to evaluate and treat dissociative symptoms. Future treatment protocols for early psychosis might benefit from including a section for addressing dissociative experiences.

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Conflict of Interest Statement

All authors declare that there are no conflicts of interests associated with this research.

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Table 7.1

Demographic and diagnostic information for sample (n = 66).

Descriptive

	n	(%)
Born in Australia	59	89.4
Gender identification		
Male	28	42.4
Female	36	54.5
Transgender	2	3.0
Ethnicity		
Caucasian	46	69.7
Australian Aboriginal	2	3.0
Other	18	27.3
Occupational status		
Working/studying (full-time or part-time)	41	62.1
Diagnostic information		
Schizophrenia	12	18.2
Schizoaffective	19	28.8
Psychotic disorder NOS	9	13.6
Brief psychotic disorder	2	3.0
Schizophreniform	5	7.6
Delusional disorder	2	3.0
Substance-induced psychotic disorder	6	9.1
Bipolar I disorder with psychotic features	10	15.2
Major depressive disorder with psychotic features	1	1.5
Medication use in last 6 months	56	84.8
History of childhood trauma	35	53.0

Table 7.2

Frequency of dissociative disorders using the SCID-D-R (n =66)

	n	%
Present diagnosis		
Depersonalisation Disorder	3	4.5%
Dissociative Amnesia	1	1.5%
DDNOS*	4	6.0%
Past diagnosis		
Depersonalisation disorder	1	1.5%
Total lifetime prevalence	**9**	**13.6%**

Note. SCID-D-R = Structured Clinical Interview for DSM-IV Dissociative Disorders-Revised, DDNOS = Dissociative Disorder not otherwise specified. Percentages have been rounded to one decimal place and therefore may not add up to 13.6 due to rounding error.
* One participant also had a past diagnosis of depersonalisation disorder

Table 7.3

Frequency of dissociative symptoms at moderate to severe levels (lifetime)

	n	%
Amnesia	17	25.8
Depersonalisation	14	21.2
Derealisation	6	9.0
Identity Confusion	7	10.6
Identity Alteration	3	4.5

Note. Symptoms were assessed using the SCID-D-R and not associated with drug use only.

Table 7.4

Lifetime prevalence of (moderate to severe) dissociative symptoms in those with versus without a history of childhood trauma

	Dissociative symptoms present n (%)	Dissociative symptoms absent n (%)	Total
Childhood trauma			
Observed	21 (87.5)	14 (33.3)	35
No childhood trauma			
Observed	3 (12.5)	28 (66.7)	31
Total	24 (100)	42 (100)	66

Note. $\chi^2(1) = 17.99$, $p < .0001$
Symptom severity ratings based on criteria outlined in the Structured Clinical Interview for DSM-IV Dissociative Disorders-Revised (SCID-D-R)

Chapter 8. Investigating the Relationship Between Childhood Trauma, Dissociation, Hallucinations and Delusions in FEP

8.1 Preamble to Manuscript Two

This chapter presents the second paper of the thesis entitled 'Does Dissociation Mediate the Relationship between Childhood Trauma and Hallucinations, Delusions in First Episode Psychosis?'. This paper primarily sought to establish whether dissociation, as measured by a clinician-rated measure (i.e., SCID-D-R) had a mediational effect on the relationship between childhood trauma and hallucinations as well as the relationship between childhood trauma and delusions. Comparative results from a set of secondary analyses utilizing the DES-II were also reported and the discrepancies in findings addressed. The key theoretical and clinical implications of the results were further discussed.

This article has been published in *Comprehensive Psychiatry*. *Comprehensive Psychiatry* is a peer-reviewed journal that accepts reports covering novel developments in diagnostic and therapeutic practices as well as basic clinical investigations. The journal is of interest to psychiatrists, psychotherapists and clinical psychologists. The impact factor of *Comprehensive Psychiatry* is 2.194 (Clarivate Analytics, 2018).

The presentation of this chapter is consistent with the publication format of manuscripts appearing in *Comprehensive Psychiatry*. However, for ease of reading, the manuscript pagination has been replaced with thesis pagination.

8.2 Declaration for Manuscript Two

Monash University

Declaration for Thesis Chapter 8, Manuscript Two

Declaration by candidate

In the case of Chapter 8, the nature and extent of my contribution to the work was the following:
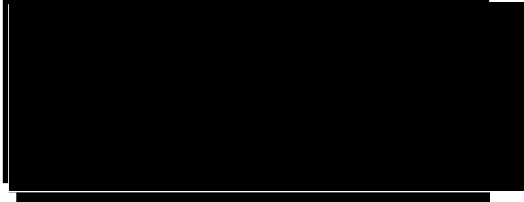
Nature of contribution	Extent of contribution (%)
Conceptualized and designed the study, data collection and analysis, wrote first and subsequent drafts of the manuscript incorporating feedback from co-authors.	**75%**

The following co-authors contributed to the work.

Name	Nature of contribution
A/Prof Mario Alvarez-Jimenez	Assistance with initial design of the paper, provided feedback on drafts.
Dr Katrina Simpson	Assistance with data analysis and interpretation. Feedback on drafts
Dr Katherine Lawrence	Assistance with initial design of the paper, provided feedback on drafts
Dr Natalie Peach	Assistance with data collection and data entry. Feedback on drafts.
Dr Sarah Bendall	Guidance with the scope, aims and conceptual design of the paper. Feedback on drafts of the manuscript.

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work*.

Candidate's Signature	███████████	Date 23/11/18

Main Supervisor's Signature	███████████	Date 23/11/18

*Note: Where the responsible author is not the candidate's main supervisor, the main supervisor should consult with the responsible author to agree on the respective contributions of the authors.

Does dissociation mediate the relationship between childhood trauma and hallucinations, delusions in first episode psychosis?

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ABSTRACT

Background: Childhood trauma has been linked to the presence of delusions and hallucinations in psychosis, although the mechanisms underlying this relationship require elucidation. Dissociation, characterized by disruptions to the integrative functioning of several core mental domains, has emerged as a potential mechanism. There is a paucity of research using a clinician-rated measure of dissociation to test the indirect effect of dissociation on the relationship between childhood trauma and psychotic symptoms. This study aimed to investigate whether dissociation mediated both the relationships between childhood trauma and hallucinations, and childhood trauma and delusions utilizing a clinician-administered measure of dissociation, namely the Structured Clinical Interview for DSM-IV Dissociative Disorders - Revised (SCID-D-R).
Method: Sixty-six first-episode psychosis (FEP) participants completed a research interview and questionnaires. Information about experiences of childhood trauma, psychosis, dissociation, general psychopathology and demographics were collected.
Results: When using the SCID-D-R, childhood trauma positively correlated with dissociation. Further, dissociation mediated the relationship between childhood trauma and delusions. Contrary to previous findings, we found no relationship between dissociation and hallucinations and no mediating effect of dissociation on the association between childhood trauma and hallucinations. The results of the SCID-D-R differed significantly from those of the Dissociative Experiences Scale-II (DES-II) which were consistent with previous research.
Conclusions: Our findings are the first to use a clinician-rated measure to test the mediating effect of dissociation on the relationship between childhood trauma and positive symptoms (i.e., hallucinations and delusions). Given the discrepancies in results between the SCID-D-R and DES-II, how dissociation is measured in future research is an important consideration. The results add to a body of work that increasingly recognizes the importance of dissociative symptoms on the relationship between childhood trauma and psychosis. The results suggest that dissociative symptoms should be part of routine assessment in those with a history of trauma and present to FEP services.

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1. Introduction

Childhood trauma has increasingly been recognized as a key risk factor for psychosis [1,2]. Epidemiological and clinical studies have found experiences of childhood trauma are related to specific psychotic symptoms – hallucinations [3–6] and delusions [3,6]. However, the mechanisms underlying the pathway from childhood maltreatment to the emergence of hallucinations and delusions remain an important

area of investigation [7,8]. One factor hypothesized to underpin the association between childhood trauma and hallucinations and delusions is dissociation [9]. In the research literature, dissociation has largely been operationalized as a disruption in the normally integrated functions of consciousness, memory, identity, cognition or perception [10]. However, the exact etiology and conceptualization of dissociation remains a contentious area of debate.

In patients with schizophrenia spectrum disorders, several studies have demonstrated associations between dissociative experiences and childhood adversity [11–15]. Additionally, studies have found a relationship between dissociation and the positive symptoms of psychosis [14–18]. Specific associations have also been found between

dissociation and hallucinations [4,16,17,19–23] and dissociation and delusions [4,16,17,21].

The evidence supports a mediating role of dissociation in the relationship between childhood trauma and hallucinations in those with schizophrenia spectrum disorders [4,21,23] and subclinical groups [24]. However, evidence for the mediational role of dissociation in relation to childhood trauma and delusions is mixed. A mediating relationship was found in those with subthreshold psychosis [24], but not in those with a schizophrenia spectrum diagnosis [4,21].

An explanation for these mixed findings may be the tool used to measure dissociative symptoms. The vast majority of studies in the area have utilized an iteration of the Dissociative Experiences Scale (DES) to capture dissociation [25,26]. The DES is a well-validated measure of dissociation [27,28]. However, the use of the DES in those with psychosis has been questioned in terms of item overlap [4,17]. Indeed, item 27 of the DES asks directly about experiences of voice hearing. Although studies which have removed question 27 from their analysis found that the relationship between psychotic and dissociative experiences remained significant [4,20,23].

Additionally, numerous items within the DES reflect perceptual disturbances and reality distortions which may not discriminate between dissociative and hallucinatory experiences. For example, item 12 asks about experiencing other people, objects and the world as not real, question 15 asks about feeling unsure if something really did happen or whether it was imagined. The phenomena described in these questions could reflect hallucinations themselves or reactions to them. It has been suggested that all six items on the depersonalization/derealization subscale of the DES reflect such perceptual experiences [17].

The utilization of a clinician-rated measure, such as the Structured Clinical Interview for DSM-IV Dissociative Disorders - Revised (SCID-D-R) might assist in distinguishing conceptually between delusional ideation and dissociation [29,30]. For example, when a patient is asked "Have you ever had the feeling that you were a stranger to yourself?" on the SCID-D, for those with schizophrenia, the feelings of self-estrangement often happen exclusively in the context of delusional beliefs concerning identity, whereas, dissociative self-estrangement often has an 'as if' quality and is not associated with delusional ideation [30]. Therefore, adequate awareness of symptom phenomenology is often required to differentiate between dissociative and psychotic symptomatology [31]. A clinician can also vary their language or use clarifying information to assess and differentiate between dissociative and psychotic symptoms.

It is important to validate and replicate the relationship between dissociation, childhood trauma and psychosis using measures in formats other than self-report (i.e., DES) [23,26]. Studies using clinician-rated measures, such as the Dissociative Disorders Interview Schedule [13] and The Association for Methodology and Documentation in Psychiatry - dissociation scale [15] have found basic associations between dissociation and psychotic symptoms. However, no study has employed a clinician-rated instrument of dissociation to directly investigate whether dissociative symptoms mediate the relationship between childhood trauma and hallucinations and delusions.

In sum, the research suggests that dissociation plays a key role in hallucinations and perhaps to a lesser extent, delusions. However, the majority of studies which have examined this relationship have utilized a self-report measure of dissociation and there is a paucity of research using other methods to quantify dissociative experiences. The present study sought to investigate the relationship between childhood trauma, hallucinations and delusions, and the mediating role of dissociation, in a FEP sample using a clinician-administered measure of dissociation. It was predicted that:

(1) the greater severity of self-reported trauma will correspond with an increased experience of dissociative symptoms as measured by the SCID-D-R and

(2) increased experience of dissociation would be associated with higher levels of
(a) hallucinations
(b) delusions,

(3) dissociation will mediate the relationship between
(a) childhood trauma and hallucinatory experiences,
(b) childhood trauma and delusional ideation.

2. Method

2.1. Participants

A total of 70 participants with FEP were recruited. Four participants completed <50% of the overall assessment and their results were discarded from the analysis. The final sample size was 66.

The participants were clients of the Early Psychosis Prevention and Intervention Centre (EPPIC) at ORYGEN Youth Health (OYH). OYH is a public, specialist mental health service for young people aged 15 to 25 years residing in the Western and North Western regions of metropolitan Melbourne, Australia. EPPIC is a clinical program that provides ongoing outpatient case management, psychotherapeutic and medical care to eligible FEP clients for a period up to two years. Participants were referred to the study by their case managers.

Participants included had a Diagnostic and Statistical Manual of Mental Disorders (4th ed. text revised; DSM-IV-TR) [10] diagnosis of a psychotic disorder or an affective disorder with psychotic features. Fluency in English, the ability to provide informed consent or consent from a parent/guardian where participants were under the age of 18 years were also requirements for participation. Participants were excluded if they had a significant intellectual disability or showed evidence of an organic brain disease. The socio-demographic and diagnostic characteristics of the sample are presented in Table 1.

2.2. Measures

2.2.1. Structured Clinical Interview for DSM-IV Axis I Disorders - Patient Edition (SCID-I)
The SCID-I is a semi-structured interview measure used to diagnose the presence of DSM-IV axis I disorders [32]. The SCID-I has demonstrated good inter-rater and test-retest reliability [33]. The SCID-I was used to establish primary diagnosis for the participants in the study.

2.2.2. Positive and Negative Syndrome Scale (PANSS)
The PANSS is a widely utilized, 30-item interviewer rated measure that assesses the presence of both positive and negative psychotic symptoms as well as general psychopathological symptoms occurring within the last fortnight of the assessment based on a semi-structured interview [34]. An internal reliability analysis of the PANSS was conducted on the various scales and items. Overall coefficients of 0.73, 0.83, and 0.79 were found for the positive, negative and general psychopathology scales respectively [34]. Good test-retest reliability after a period six months was also demonstrated [34].

2.2.3. Childhood Trauma Questionnaire-Short Form (CTQ)
The degree of childhood trauma was measured by the CTQ, which is a 28-item retrospective, self-report questionnaire that measures an individual's experience of abuse (physical, sexual and emotional) and neglect (physical and emotional) while growing up [35]. The scale has demonstrated good criterion validity as well as measurement invariance across different sample groups [35]. The extent of maltreatment for each subtype of abuse or neglect can classified as none, low, moderate or severe based on a set of validated threshold scores [36]. Participants were counted as experiencing abuse or neglect

Table 1
Demographic and diagnostic information for sample ($n = 66$).

Descriptive		
Mean age (Standard deviation)	20.18 years ($SD = 2.69$)	
	n	Percentage (%)
Born in Australia	59	89.4
Gender identification		
Male	28	42.4
Female	36	54.5
Transgender	2	3.0
Ethnicity		
Caucasian	46	69.7
Asian	4	6.1
African	3	4.5
Indigenous Australian/Pacific Islander	5	7.6
Other	8	12.1
Occupational status		
Not working/studying	25	37.9
Part-time work/study	22	33.3
Full-time work/study	19	28.8
Primary diagnosis		
Schizophrenia	12	18.2
Schizoaffective	19	28.8
Psychotic disorder NOS	9	13.6
Brief psychotic disorder	2	3.0
Schizophreniform	5	7.6
Delusional disorder	2	3.0
Substance-induced psychotic disorder	6	9.1
Bipolar I disorder with psychotic features	10	15.2
Major depressive disorder with psychotic features	1	1.5
Personality disorder		
Borderline personality disorder	5	7.6
Dissociative disorder (current)	4	6.0
Medication use in last 6 months		
Antipsychotic	40	60.6
Antidepressant	12	18.2
Mood stabilizer	3	4.5
Other	1	1.5
No medication	10	15.2
Family history of mental illness		
Present	39	59.1
None	15	22.7
Unknown	12	18.2
First degree relative with severe mental illness	8	12.1

if their score on the CTQ subscale fell in the moderate to severe range. For the analyses, a total CTQ score for each participant was created by adding their scores on all five subtypes of trauma.

2.2.4. Structured Clinical Interview for DSM-IV Dissociative Disorders-Revised (SCID-D-R)

The SCID-D-R was used as the primary measure of dissociation [29]. SCID-D-R is a clinician-administered, semi-structured diagnostic interview that systematically assesses the severity of five core dissociative symptoms (amnesia, depersonalization, derealization, identity confusion, and identity alteration). The character, frequency and severity of dissociative experiences are assessed with open-ended and individualized follow-up questions. Numerous studies across several countries have reported good to excellent inter-rater reliability for the types of dissociative disorders ranging from ($\kappa = 0.72$ to 0.86), test-retest reliability for the presence of dissociative disorders ($\kappa = 0.88$) and temporal reliability (at baseline, 2 weeks and 6-month follow-up), for both the presence and extent of dissociative symptoms ranging from ($\kappa = 0.77$ to 0.86) [37]. The SCID-D-R has shown discriminant validity in differentiating between dissociative disorders, other psychiatric conditions and feigners [30,31]. In the present study, where participants had stated that their dissociative symptoms occurred only with substance use, their score on the relevant symptom subscale/s was recoded as 'absent'. For each participant, ratings on the

five symptom scales were summed to derive the total SCID-D-R score [31].

2.2.5. Dissociative Experiences Scale-II (DES-II)

Considering the majority of previous studies have used a form of the DES, the DES-II was administered to enable comparisons between our data and prior findings in the area. The DES is a 28 item self-report measure that is frequently used as a screening tool for dissociative experiences and disorders in both clinical and nonclinical populations [27]. It has established test-retest reliability with an average correlation of 0.86 and high internal consistency with a reported mean α of 0.93 [28]. The DES has demonstrated criterion-referenced concurrent validity and medium to strong convergent validity with several similar questionnaires and interview-based measures of dissociation [27,28]. It consists of 3 subscales: amnesia, depersonalization/derealization and absorption. Participants rate each item on a scale of 0–100. We removed item 27, which asks directly about voice-hearing from the scoring. The ratings for each item are totaled and then divided by the total number of items.

2.3. Procedure

The Human Research and Ethics Committees associated with Melbourne Health, Monash University and The University of Melbourne granted approval to conduct the study. Prior to assessment, each participant received a written, plain language statement with information about the study and written consent to participate was provided. Participants were reimbursed $40 to cover expenses associated with study participation.

Participants completed the research assessment which included the clinician-administered interviews (SCID-I, PANSS, SCID-D-R), self-report questionnaires (CTQ and DES-II) and answering basic demographic questions. The various measures were rated and scored post-interview. Rates of childhood maltreatment by type are presented in Table 2.

2.3.1. Data analyses

The study employed a cross-sectional design. Correlations and mediation analyses were completed using Statistical Package for the Social Sciences version 24 (SPSS v24). To examine whether dissociation mediated the relationship between childhood trauma and hallucinations and childhood trauma and delusions, two simple mediation analyses were conducted using the PROCESS macro version 2.16, available for SPSS (see Hayes, 2013 for documentation) [38].

Mediation was determined by examining the statistical significance of the indirect effect ($a \times b$) of the independent variable (IV) via the mediator (M). The indirect effect is quantified as the product of the effect of the IV on M (a), and the effect of M on the dependent variable (DV), with the effect of the IV partialed out (b). Mediation occurs if (1) there is an effect to be mediated (i.e., the IV predicts the DV, direct effect, (c) $\neq$ 0) and (2) the indirect effect ($a \times b$) is statistically significant, and occurs in the hypothesized direction [39].

PROCESS was applied to estimate the non-standardized model coefficients, standard errors and p-values utilizing ordinary least squares regression. It was further used to generate a bias corrected

Table 2
Frequency of childhood trauma by type ($n = 66$).

	n	%
Sexual abuse	16	24.2
Physical abuse	12	18.2
Emotional abuse	23	34.8
Emotional neglect	16	24.2
Physical neglect	16	24.2
Any trauma	35	53.0
Polytraumatization	21	31.8

and accelerated (BCa) 95% bootstrap confidence interval (CI) for the indirect effect using 5000 bootstrap samples to calculate the significance of the mediation. Bootstrapping is considered to be a robust method and can overcome violations of assumptions, such as non-normally distributed data [40]. Point estimates were considered significant at $p < 0.05$ if the BCa CI did not contain zero.

The same correlational and mediation design was utilized in post-hoc, exploratory analyses using the DES-II. For the secondary analysis, item 27 of the DES-II (voice-hearing) was removed from the score in accordance with previous research [4,20,23]. All other variables were derived in the same manner as the primary analyses.

3. Results

The data was screened and parametric assumptions were not met. Therefore, correlations are reported as Spearman's rho (ρ). There were no missing items for any of the variables. Cases with z scores over 3.29 ($p < 0.001$) are considered potential outliers; there were no cases that met the outlier assumption. Means and standard deviations for the measures applied are presented in Table 3.

3.1. Primary data analysis using the SCID-D-R

A significant, strong, positive association between the experience of childhood trauma and levels of dissociative experiences was revealed. In terms of specific psychotic symptoms, a moderate, significant relationship between dissociation and delusional experiences was found. However, dissociation was not significantly correlated with hallucinations. No significant relationship was found between experiences of dissociation and the negative symptoms of psychosis. The results of the correlational analyses are presented in Table 4.

In the mediation models, dissociation (total score on the SCID-D-R) was the mediating variable and childhood trauma (scores on the CTQ) was the predictor. The outcome variables were (1) hallucinations and (2) delusions, a summary of the mediational analysis is provided in Table 5. A non-significant indirect effect of childhood trauma on hallucinations through dissociative experiences was found, $\beta = -0.0006$, 95% BCa CI [−0.01, 0.01].

The mediated effect of childhood trauma on delusions via dissociation was significant, $\beta = 0.02$, 95% BCa CI [0.01, 0.04] (see Fig. 1). These results suggest that dissociation mediated the relationship between childhood trauma and delusions but not childhood trauma and hallucinatory experiences.

3.2. Secondary data analysis

Scores on the DES-II were significantly correlated with childhood trauma ($\rho = 0.47$, $p < 0.001$), hallucinations ($\rho = 0.34$, $p = 0.005$), delusions ($\rho = 0.27$, $p = 0.027$) and the SCID-D-R total score ($\rho = 0.40$, $p = 0.001$). No significant relationship was found between negative symptoms and the DES-II ($\rho = 0.22$, $p = 0.084$).

Table 3
Mean scores and standard deviations for PANSS positive and negative subscales, hallucination and delusions, SCID-D-R, DES-II and CTQ.

Measure	M (SD)
PANSS–positive	11.73 (4.02)
PANSS–negative	11.61 (4.40)
PANSS-total	49.64 (13.09)
Hallucinations	2.23 (1.63)
Delusions	3.94 (2.05)
SCID-D-R total	7.24 (2.70)
DES-II total	25.00 (16.41)
CTQ total	46.77 (18.58)

Table 4
Spearman rank correlation analysis of childhood trauma, dissociation, hallucinations, delusions and negative symptoms($n = 66$).

Measure	1.	2.	3.	4.
1. Childhood trauma	–			
2. Dissociation	0.54***	–		
3. Hallucinations	0.26*	0.13	–	
4. Delusions	0.33**	0.48***	0.33**	–
5. Negative symptoms	0.17	0.19	0.33**	0.26*

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

When using scores on the DES-II as the mediator in the analysis, dissociation significantly mediated the relationship between childhood trauma and hallucinations (indirect effect, $\beta = 0.01$, 95% BCa CI [0.003, 0.03]), but not the relationship between childhood trauma and delusions (indirect effect, $\beta = 0.01$, 95% BCa CI [−0.002, 0.03]).

4. Discussion

The hypothesis that greater severity of self-reported trauma will correspond with an increased experience of dissociative symptoms on a clinician administered, semi-structured interview (i.e., SCID-D-R) was supported. The second set of hypotheses, that an increased experience of dissociation would be associated with higher levels of hallucinations and delusions was partially supported, dissociation significantly correlated with delusions but not hallucinations. The final set of predictions were also partially supported, dissociation mediated the relationship between childhood trauma and delusions, but not childhood trauma and hallucinations.

Our results showed positive associations between childhood trauma and dissociation in a group with FEP and is consistent with a body of research that has largely included patients with schizophrenia spectrum disorders [11,14]. Childhood maltreatment appears to be a common experience for those with FEP and reported rates of childhood trauma in our sample, were similar to those found in other studies of FEP which range from 51% to 89% [12,41,42]. The association between childhood trauma and dissociation in this current study supports the theory that dissociation is a potentially protective reaction to traumatic events in childhood, which can become generalized and problematic, enduring into adolescence and adulthood [43].

Our data is congruent with research which found associations between dissociation and delusional ideation [4,16,17,21]. Furthermore, our findings support the existence of a relationship between childhood trauma and delusions, which is mediated by dissociation. Although the present study is not the first to find that dissociation mediates the relationship between childhood maltreatment and delusions [24], it is the first to extend this from a sample with subclinical psychotic symptoms to a clinical group. This finding supports current cognitive

Table 5
Summary of the simple mediation models: Parameter estimates for the total, direct and indirect (i.e. dissociation as mediator) effects of childhood trauma on hallucinations and delusions ($n = 66$).

Dependent variable	a	b	c'	a × b	95% CI	c
1. Hallucinations	0.07**	−0.01	0.02	−0.0006	[−0.01, 0.01]	0.021*
2. Delusions	0.07**	0.35***	0.01	0.02*	[0.01, 0.04]	0.03*

The estimates reported are unstandardized beta coefficients based on 5000 bootstrapped iterations. Independent variable (IV) = childhood trauma (CTQ), Mediator variable (MV) = dissociation (SCID-D-R), Dependent variable (DV) = hallucinations; delusions. CI = confidence interval, a = effect of IV on MV, b = effect of MV on DV in the mediated model, c' = direct effect of IV on DV in the mediated model, a × b = indirect effect, c = total effect.
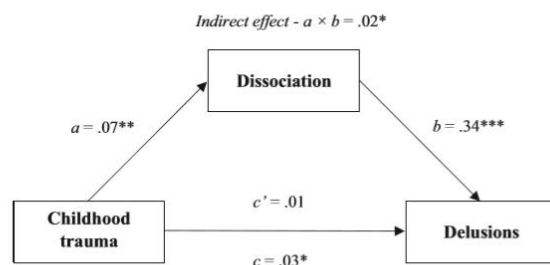* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

Fig. 1. Simple mediation model of childhood trauma on delusions as mediated by dissociation. Note. Values are unstandardized beta coefficients. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

models of the etiology and maintenance of delusions in the context of trauma [9,44,45]. The model posits that anomalous experiences and culturally unacceptable interpretations of these anomalous experiences form the basis of hallucinations and delusions [44,45]. Dissociation functions as a source of cognitive disturbance which generate anomalous experiences [8,44]. Delusional ideation arises from inaccurate explanations for these aberrant experiences. While not mutually exclusive, an alternative explanation for the relationship between trauma, dissociation and delusions is that post-traumatic dissociation impairs a person's ability to reality-test by undermining both their internal and external 'anchors' making them prone to both hallucinations and delusional thinking [46]. This model has not been directly tested with delusions but was not supported when tested in relation to hallucinations [23]. Future studies could explicitly test the relationship between delusions, dissociation as a source of anomalous experiences, dysfunctional appraisals of such experiences and impaired reality-testing within these proposed models.

In explaining aspects of our results that differ from previous research, discrepancies in methodology need to be considered. The use of the SCID-D-R rather than the DES-II could account for the significant mediational relationship between childhood trauma, dissociation and delusions. The use of the SCID-D-R may also account for the failure to find a significant association between dissociation and hallucinations, in contrast to previous research [16,19,20,22]. Our secondary analyses utilizing the DES-II, mirrored that of prior research whereby correlations between dissociation and delusions were significant but the mediational effect of dissociation on the relationship between childhood trauma and delusions was not [4,21]. Similar with past studies, hallucinations significantly correlated with dissociation, and dissociation mediated the relationship between childhood trauma and hallucinatory experiences when the DES-II was used to measure dissociation [3,21,23].

We speculate that the SCID-D-R and the DES-II may have captured different phenomenological characteristics of dissociation in our sample and these aspects have a distinctive relationship with hallucinations and delusions. The potential differences may explain why two instruments designed to measure the same attribute correlated at only a moderate level ($\rho = 0.40$). Furthermore, this may explain the divergent relationships between each of these measures and hallucinations and delusions.

Hallucinations and delusions likely have distinct etiologies, therefore, it is conceivable that they are associated with different types of dissociative processes. Holmes and colleagues (2005) suggest that dissociation can be separated into two types of experiences – detachment and compartmentalization which are distinct qualitatively as well as in underlying causal mechanisms [47]. Detachment consists of symptoms that reflect alterations of consciousness, leading to feelings of unreality and a profound sense of disconnection (e.g., symptoms of depersonalization/derealization), and compartmentalization is characterized by a deficit in deliberate control over processes and/or

actions that under normal circumstances are controllable (e.g., amnesia, identity alteration, fugue states) [47]. There is some preliminary evidence that distinct dissociative experiences relate differently to hallucinations and delusions [19,24]. In those with schizophrenia, depersonalization is shown to predict hallucinations [19] and mediate the relationship between childhood trauma and hallucinations [21]. In a subclinical group, absorption mediated with relationship between childhood maltreatment and hallucinations; absorption and amnesia (negatively) mediated childhood maltreatment and delusions [24]. These early results suggest that perhaps detachment dissociation is associated with hallucinations and compartmentalization with delusions. Future studies should examine the relationship between various aspects of the dissociative experience as measured by the subscales of the SCID-D-R and hallucinations and delusions.

Given the discrepancies in our current study, between findings for the SCID-D-R and DES-II, greater consideration of the instrument used to capture dissociative experiences in future research is of vital importance. Furthermore, to progress our understanding in this area of research the significant overlap between dissociative and positive psychotic symptomatology needs to be clarified, and any diagnostic boundaries agreed upon [23,26]. Regardless of whether a dimensional or categorical framework of psychopathology is adopted to assess dissociative and psychotic symptoms in future research, it remains a fundamental requirement to address how these complex psychological constructs are defined and measured in the literature.

The results of this study have pertinent implications for clinical practice. Considering the high rates of childhood maltreatment in FEP, previous research has recommended the routine assessment of trauma history in services catering to young people with early psychosis [41,48,49]. For people experiencing FEP who have a trauma history, the significant association between childhood trauma and dissociation found in this and other studies highlights the need for dissociative symptoms to likewise be included in routine assessment. A comprehensive understanding of the post-traumatic and psychotic symptom profile will lead to more informed formulation, treatment-planning and intervention [50]. Training and support should be provided to clinicians who practice in FEP services and lack the confidence or skills to assess and treat symptoms of dissociation. Training might focus on how clinicians can better formulate around a person's dissociative and psychotic symptoms, deliver appropriate support and psychoeducation and utilize targeted treatment to reduce the impact of dissociation and associated psychotic symptoms. For instance, grounding techniques are recommended for reducing both symptoms of dissociation and psychosis [51,52]. Appropriate training is especially important considering that experiences of dissociation can complicate the effectiveness of standard trauma-focused treatments that are applied in early psychosis groups [53]. Finally, more research is needed to improve the efficacy of clinician training and targeted treatment of dissociation in those with psychosis.

The current study has a number of limitations. Firstly, similar to most studies in the area, our study adopted a retrospective, cross-sectional and largely correlational design. Therefore, we are unable to make any conclusive statements about causality. Future studies adopting a longitudinal design may better elucidate the precise order of emerging dissociative and psychotic symptoms following trauma.

Secondly, we relied on a self-report measure of childhood trauma. It has been suggested that retrospective reporting of childhood maltreatment may be biased by inadequate or distorted memories. However, the evidence tends to support the reliability of recollections of trauma history in those with psychosis [54].

In conclusion, our study is the first to use a clinician-rated measure of dissociation to test the mediational effect of dissociation on the relationship between childhood trauma, hallucinations and delusions, in a FEP cohort. Our findings add to an existing research base which increasingly recognizes the relevance of dissociation in the context of psychotic psychopathology and trauma history. Given that the two

measures of dissociation used in our study yielded significantly different results highlights the importance of tool selection for assessing complex symptomatology in future research.

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Chapter 9. Additional Results

The results of an additional unpublished analysis which examined whether hallucinations and delusions were differentially related to the different types of dissociation described in the bipartite model are presented and discussed in this chapter. The analysis addressed the third aim of the thesis (Section 5.2.3) and provided data for the research question (5.2.3.1): *"are hallucinations related to compartmentalization dissociation and/or detachment dissociation?"* and question (5.2.3.2): *"are delusions related to compartmentalization dissociation and/or detachment dissociation?"*

9.1 Data Screening and Preliminary Analysis

Initial data screening and analysis was carried out in accordance with the procedures outlined in Section (6.6.2) and (6.6.2.3). All the data analyses for this chapter were conducted using IBM SPSS version 25. The data was screened for outliers, skewed distributions, and missing data. To assess for normality, the distribution plots of the continuous variables were inspected, and the skewness and kurtosis were measured. Several variables were positively skewed. To correct for this, log and square root transformations were performed on the non-normally distributed data, however, neither transformation improved the normality of the distributions. Therefore, the analyses were conducted on untransformed data using nonparametric correlations (Spearman's rho). The magnitude of the relationships, as indicated by the size of the correlation coefficient, was interpreted using criteria outlined in Cohen (1992). There was no missing data for the variables of interest.

Given, the substantial number of variables included in the correlational analyses, Bonferroni adjustments were made to the alpha level to minimize the likelihood of Type I error

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(i.e., false positives) when interpreting the statistical significance of the correlations. To calculate the adjusted significance level using Bonferroni's method, the original, critical *p* value (0.05) was divided by the number of statistical tests required in the analysis. Following Bonferroni correction, a new significance level of $p < .001$ was applied to the results. The mean scores and standard deviations for the variables are provided in Table 9.1.

Table 9.1

Mean scores and standard deviations for CTQ, PANSS-hallucination and PANSS-delusions, suspiciousness/persecution, detachment, compartmentalization, subscales of the SCID-D-R and DES-II

Measures	Mean	SD
Childhood Trauma	46.77	18.58
Hallucinations	2.23	1.63
Delusions	3.94	2.05
SCID-D-R subscales		
Amnesia	1.76	0.88
Depersonalization	1.68	0.95
Derealization	1.33	0.64
Identity Confusion	1.32	.66
Identity Alteration	1.15	.47
DES-II subscales		
Absorption	13.79	9.39
Depersonalization/derealization	8.98	9.69
Amnesia	8.97	9.68
Detachment	3.02	1.33
Compartmentalization	4.23	1.61

Note. SD = Standard Deviation, Childhood Trauma Questionnaire-Short Form = CTQ, Positive and Negative Symptoms Scale = PANSS, Structured Clinical Interview for DSM-IV Dissociative Disorders-Revised = SCID-D-R, Dissociative Experiences Scale-II = DES-II.
Detachment = sum of depersonalization and derealization subscales of the SCID-D-R,
Compartmentalization = sum of amnesia, identity confusion and alteration subscales of the SCID-D-R.

9.2 Results for Aim Three

9.2.1 Research Question One

After Bonferroni adjustments were made to the alpha level, hallucination as measured by the PANSS, was not significantly associated with any index of dissociation (detachment, compartmentalization, subscales of the SCID-D-R and subscales of the DES-II).

9.2.2 Research Question Two

Following Bonferroni-adjustments, delusional ideation (delusions and suspiciousness/persecution subscales of the PANSS) was significantly associated with the compartmentalization factor at a moderate level ($\rho = .45$, $p < .001$). Significant, moderate correlations were also found between delusions and the identity alteration subscale of the SCID-D-R and the depersonalization/derealization subscale of the DES-II.

There was a large, significant correlation between the two types of dissociation, detachment and compartmentalization. The full results of the bivariate analysis are presented in Table 9.2 on the following page.

Table 9.2

Spearman rank correlation analysis of childhood trauma, hallucinations, delusions, subtypes of dissociative symptoms and types of dissociation (n = 66).

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Hallucinations	-	-	-	-	-	-	-	-	-	-	-	-
2. Delusions	.33**	-	-	-	-	-	-	-	-	-	-	-
3. Childhood Trauma	.26*	.33**	-	-	-	-	-	-	-	-	-	-
DES-II Subscales												
4. Absorption	.34**	.29*	**.51***	-	-	-	-	-	-	-	-	-
5. Depersonalization/derealization	.32*	**.43***	.39**	**.69***	-	-	-	-	-	-	-	-
6. Amnesia	.17	.22	.30*	**.70***	**.74***	-	-	-	-	-	-	-
SCID-D-R Subscales												
7. Depersonalization	.09	.34**	**.43***	.17	.40**	.18	-	-	-	-	-	-
8. Derealization	.06	.32**	.21	.09	.33**	.13	**.43***	-	-	-	-	-
9. Amnesia	.10	.39**	**.47***	.36**	.32**	.33**	**.45***	.36**	-	-	-	-
10. Identity Confusion	.08	.33**	.39**	.21	.36**	.10	**.57***	.35**	.36**	-	-	-
11. Identity Alteration	.04	**.44***	.33**	.18	.30*	.21	**.48***	.28*	**.46***	**.56***	-	-
Dissociative Types												
12. Detachment	.09	.40**	**.44***	.21**	**.47***	.23	**.93***	**.70***	**.48***	**.58***	**.47***	-
13. Compartmentalization	.16	**.45***	**.57***	.39**	.42 **	.34**	**.59***	**.42***	**.92***	**.66***	**.57***	**.63***

Note. Significant Bonferroni corrected correlations are presented in bold.

* p < .05, ** p < .01, *** p <.001

9.3 Interpretation of Results

With respect to research question (5.2.3.1), hallucinatory experiences were not associated with either compartmentalization or detachment dissociation as operationalized in our study. Nor were there significant correlations between any of the subscales of the SCID-D-R and hallucinations. Although hallucinations were significantly associated with the depersonalization and absorption subscales of the DES-II, which is consistent with past research (e.g., Kilcommons & Morrison, 2005; Perona-Garcelán, Carrascoso-Lopez et al., 2012), when stricter conditions were applied to interpreting the test of significance, these relationships were no longer considered significant.

In terms of the research question (5.2.3.2), significant associations were found between delusions and both compartmentalization and detachment dissociation as well as all the subscales of the SCID-D-R. However, only the relationship between compartmentalization and delusions, as well as the identity alteration subscale of the SCID-D-R and delusions remained significant when Bonferroni-adjustments to the alpha level were considered. By contrast, the depersonalization subscale was the only DES-II to maintain a significant correlation with delusions following Bonferroni-correction.

One explanation for the significant association between delusions compartmentalization could be that despite the loss of volitional control of mental functions associated with compartmentalization, these compartmentalized functions remain 'intact' and continue to operate and influence affect, cognitions and behavior (Holmes et al., 2005). If these compartmentalized functions continue to impact on the thoughts, feelings and behaviors of the person, but the original source of such experiences remains consciously inaccessible and 'unexplained', this may increase experiences of paranoia and delusional explanations in those vulnerable to psychosis. This proposal is similar to Ross's (2008) idea that delusional ideation

may be the product of cognitive errors and/or compartmentalized thoughts from a dissociated identity intruding into the 'executive' self and interpreted within a delusional framework.

However, given the major discrepancies in results when either the SCID-D-R or the DES-II were used to index dissociation, it is difficult to say definitively whether hallucinations and delusions are differentially related to the two different types of dissociation described in the bipartite model. Furthermore, such a distinction may be somewhat arbitrary in our study given that compartmentalization and detachment were significantly correlated ($\rho = .63$). Although two variables can be qualitatively distinct and still be highly correlated, for example the subscales of the PANSS (Vogel et al., 2013). Our finding is consistent with the notion that the separation of compartmentalization and detachment is a complex process and they are in reality likely to be interactive and not entirely mutually exclusive (e.g., Spitzer et al., 2006).

Furthermore, there is continued debate surrounding the classification of certain dissociative experiences as either compartmentalization or detachment phenomena. For example, Steele and colleagues (2009) argue that out of body experiences and the observation of the self from an external vantage point, currently considered to be experiences of depersonalization and therefore detachment dissociation, should actually be categorized as compartmentalization. In addition, there may be an interplay between the two types of dissociation in the formation of specific dissociative symptoms. For example, although dissociative amnesia (i.e., inability to voluntarily bring specific memories into consciousness) is considered a phenomenon of compartmentalization, in some cases an altered state of consciousness associated with a state of dissociative detachment is believed to disrupt the normal processes of encoding and storing memories, particularly those associated with traumatic events (Allen et al., 1999) Therefore, while dissociative amnesia may manifest as compartmentalization dissociation, its cause may actually be associated with detachment.

These added complexities of the dissociative experience mean that the bipartite model requires some further defining and validation.

The method of operationalizing compartmentalization and detachment in this study (by using the sum of existing SCID-D-R subscales) may not be the most optimal. While theoretically the amnesia, identity alteration and identity confusion subscales of the SCID-D-R reflect compartmentalization dissociation and the depersonalization and derealization subscales represent detachment, the use of the SCID-D-R to assess and differentiate between the two types of dissociation described in the bipartite model has not been systematically tested. However, at the time of designing the present study, there were no validated measures of detachment and compartmentalization dissociation available. More recently, as part of an unpublished thesis, Butler (2017) sought to develop and validate a measure of detachment and compartmentalization dissociation – the Detachment and Compartmentalization Inventory (DaCI). According to Butler (2017) the items for the DaCI were derived from the trauma and dissociation literature with particular emphasis on the structural dissociation model (van der Hart et al., 2004), opinions from experts in the field of dissociation, and items on 26 existing measures of dissociation.

From an initial item pool of approximately 945 items, through the examination of item-total correlations and subsequent factor analysis, a final 22 item scale that consisted of 10 detachment and 18 compartmentalization items as well as 2 validity items was constructed (Butler, 2017). The psychometric properties of the final DaCI was examined on a clinical sample with a broad range of psychiatric disorders ($n = 105$) and a non-clinical sample of ($n = 89$) participants. Butler (2017) found good internal reliability for the DaCI as a whole (Cronbach's alpha = .97) and for each subscale, detachment (Cronbach's alpha = .93) and compartmentalization (Cronbach's alpha = .96). Furthermore, good concurrent validity was demonstrated in that the clinical sample reported significantly higher scores on the total DaCI

and for the compartmentalization and detachment subscales compared to non-clinical participants. Significant negative correlations were also found between scores on the DaCI subscales and the Mindfulness Attention Awareness Scale demonstrating discriminant validity (Butler, 2017).

Whilst the DaCI demonstrated a degree of structural, convergent and construct validity, there were several issues with these indices. For instance, results from the principal components analysis of the final DaCI scale yielded a two-factor solution consistent with the bipartite model. However, the scale still had five items that were within a .30 loading distance from each other. Furthermore, both the detachment and compartmentalization subscales were significantly correlated with scores on the DES and SDQ and there were no statistically significant differences in the strength of these correlations. Both DaCI subscales also correlated significantly with all DES subscales (absorption, depersonalization/derealization and amnesia), similarly no significant differences in the size of the correlations between the compartmentalization and detachment were found (Butler, 2017).

Despite these issues, the development of DaCI represents a promising step forward in the measurement of compartmentalization and detachment type dissociation and could be used in future studies that aim to validate the bipartite model in general. The development of a well-validated measure of compartmentalization and detachment will also assist in future studies that examine the relationship between psychosis and distinct types of dissociative experiences.

Despite the limitations of our study outlined above, it was the first to examine the relationship between the bipartite model of dissociation and hallucinations and delusions in a FEP sample. It also provided useful data regarding the relationships between childhood trauma, hallucinations, delusions and the subscales of the SCID-D-R and DES-II in early psychosis. Examining the relationship between sub-types of dissociative experiences and hallucinations

and delusions offers a more nuanced understanding of the relationship than results from total

dissociation scores alone.

Chapter 10. Integrated Discussion

The main purpose of this integrated discussion is not to restate the results and discussions points presented in the manuscripts (Chapters 7 and 8) or those of the additional results (Chapter 9). Rather, the key findings of the thesis as an entirety will be summarized and broadly discussed in the context of the aims of the study, the literature reviewed in Chapters 2 to 4 and with due consideration to their theoretical and clinical implications. The limitations of the thesis as well as directions and recommendations for future research will also be addressed in this final chapter.

10.1 Key Findings and Implications

The key findings of this thesis and the important implications arising from these findings will be summarized and discussed in this section. The overarching aim of this thesis was to examine the relationship between experiences of childhood trauma, dissociation and psychotic symptoms, as well as the prevalence of dissociative disorders and symptoms in a group that to date, has been inadequately studied – young people with FEP. In particular, we investigated the effect of dissociative mechanisms on the relationship between childhood trauma and positive psychotic symptoms (i.e., hallucinations and delusions), and whether hallucinations and delusions were associated with different types of dissociation proposed in the bipartite model (e.g., Holmes et al., 2005). Furthermore, we sought to examine the relationship between childhood trauma, dissociation and psychosis utilizing a clinician-administered measure of dissociation (i.e., the SCID-D-R) to quantify experiences of dissociation rather than the predominantly used DES.

Overall, our results from Chapter 8 showed discrepancies with past research (e.g., Kilcommons & Morrison, 2005; Perona-Garcelán, 2010; Varese, Barkus et al., 2012) when

using an alternative measure to the DES to quantify the relationship between dissociation and hallucinations and delusions. When using the SCID-D-R, we found that dissociation was significantly correlated with delusions but not hallucinations and that dissociation mediated the relationship between childhood trauma and delusions but not hallucinations. Furthermore, as presented in Chapter 9, hallucinations were not significantly correlated with either compartmentalization or detachment as indexed by the SCID-D-R. While both compartmentalization and detachment were positively associated with delusions, however, when stricter criteria for significance testing was applied (i.e., Bonferroni-correction) to reduce the likelihood of type I error, only the relationship between compartmentalization and delusions remained significant.

An interesting aspect of our findings presented in Chapters 8 and 9 is the discrepancy in results when either the DES-II or SCID-D-R was used to measure experiences of dissociation. Given the ubiquitous use of various versions of the DES in past research, we also included the DES-II in our battery of measures to compare findings from the SCID-D-R with those from the DES-II. As demonstrated in Chapter 8, the pattern of results from the DES-II mirrored those found in the previous literature (e.g., Perona-Garcelán, Carrascoso-López 2012; Varese, Barkus et al., 2012). Dissociation was positively associated with hallucinations and delusions and dissociation significantly mediated the relationship between childhood trauma and hallucinations. Furthermore, both the absorption and depersonalization/derealization subscales of the DES-II were correlated with hallucinations (although not significant at Bonferroni-adjusted levels) and only depersonalization was significantly correlated with delusions following Bonferroni-correction. In this thesis, results from the DES-II are markedly different from those of the SCID-D-R. Potential explanations and implications for this discrepancy in measurement will be discussed in Section 10.3 if this chapter.

While there were specific differences in the pattern of results when either the SCID-D-R or DES-II was used to measure dissociation, in general our results add to a body of work that increasingly recognizes the relevance of dissociative mechanisms on the relationship between childhood trauma and the symptoms of psychosis.

Broadly-speaking, the key implications of our findings relate to (1) the reconsideration of the rigid diagnostic boundaries between dissociative and psychotic symptoms and disorders (2) the need for greater consideration of the methods in which dissociative experiences are quantified and the validity of dissociative measures and finally, (3) clinical implications for trauma-informed treatment approaches and the management of dissociative symptoms within early psychosis intervention settings.

10.2 Dissociation and Psychosis: Reconsidering Diagnostic Boundaries

As noted in Section 2.2, Bleuler's original characterization of schizophrenia as a 'split mind' was "infused with dissociative concepts" and indicative of the early recognition of the phenomenological similarities between these two diagnostic groups (Moskowitz, 2011, p. 348). In the literature described in Section 4.5, several studies have also found a high prevalence of DID, other dissociative disorders and severe dissociative symptoms in those diagnosed with schizophrenia (Haugen & Castillo, 1999; Moise & Leichner, 1996; Steinberg et al., 1994). On the other side, those with DID frequently met diagnostic criteria for schizophrenia (e.g., Boon & Draijer, 1993; Ellason et al., 1996; Putnam et al., 1986; Ross, Norton et al., 1989; Ross, Miller et al., 1990).

It was further found in the literature that those with DID experience many of the symptoms associated with psychosis making it harder to differentiate between these two diagnostic groups. People with DID reported more first-rank Schneiderian symptoms such as

voices arguing or commenting, thought insertion, withdrawal or broadcasting, delusional perceptions, made actions and somatic passivity than those with schizophrenia (Laddis & Dell, 2012; Ross, Miller et al., 1990). In one study, those with DID scored significantly higher on the positive syndrome scale of the PANSS compared with participants with schizophrenia, by contrast those with schizophrenia had significantly higher scores on the negative syndrome scale compared with DID (Ellason & Ross, 1995). Furthermore, as a way to differentiate between dissociative disorders and schizophrenia, it has been suggested that the auditory hallucinations associated with dissociative disorders are perceived as coming from an internal location whereas those associated with schizophrenia are perceived as coming from an external source (Steinberg, 1995; van der Zwaard & Polak, 2001). However, Dorahy and colleagues (2009) demonstrated that externally located voices were uncommon in those with schizophrenia and both those with DID and schizophrenia had similar patterns of internally located voices. Therefore, the separation of these two diagnostic groups might be difficult in some cases, especially where there is a preponderance of positive symptoms such as hallucinations and delusions.

In this thesis, we found that around 14% of our FEP sample had met criteria for a lifetime dissociative disorder. This prevalence rate was comparable to those of past studies examining outpatients with chronic schizophrenia (average prevalence 20%) (Haugen & Castillo, 1999; Moise & Leichner, 1996; Steinberg et al., 1994; Tschoeke, et al., 2014). However, the prevalence of dissociative disorders found in our study was only slightly higher than the average prevalence rate found in the general population (approximately 10%) (Şar, 2011). Furthermore, unlike previous studies with chronic schizophrenia, none in our study had a diagnosis of DID, this difference could be due to the young age of our participants. Similarly, to other studies of adolescents and young people, the most prevalent current dissociative disorder diagnosis in our study was DDNOS (Carrion & Steiner, 2000; Putnam, Hornstein &

Peterson, 1996; Şar et al., 2014). It has been proposed that in some young people, their experience of severe dissociative psychopathology often fall short of a typical DID diagnosis, but may progress into diagnosable DID if dissociative symptoms continue (Putnam, 1993). However, there is no reliable longitudinal data for the developmental course of dissociative psychopathology in children and adolescents and across the lifespan. This might present an interesting direction for future research. In addition to the study of the evolution of dissociative psychopathology across the lifespan, the co-occurrence of psychotic symptoms and the factors leading to the development of either diagnostic presentation could also be examined longitudinally.

With respect to the co-occurrence of dissociative and psychotic symptoms, we reported in Chapter 7 of this thesis that 36% of our early psychosis sample were experiencing dissociative symptoms at elevated levels, (symptoms rated as moderate to severe on the SCID-D-R). Although the pattern of significant relationships between dissociation and the specific symptoms of psychosis (i.e., hallucinations and delusions) differed depending on the measure of dissociation used (either the DES-II or SCID-D-R), our findings presented in Chapters 8 still suggest that dissociative mechanisms underlie the relationship between childhood trauma and positive psychotic symptoms. It may be that the aspect of dissociation measured by the SCID-D-R underlies delusions and the aspect of dissociation represented in the DES-II underlies hallucinations (see Section 10.3).

As discussed in Chapter 4 of this thesis, past research has reported a high incidence of hallucinations in those with dissociative disorders, a consistent relationship between hallucinatory experiences and dissociation (e.g., Pilton et al., 2015), and that dissociation mediates the relationship between childhood trauma and hallucinations (e.g., Perona-Garcelán, Carrascoso-López et al., 2012; Varese, Barkus et al., 2012). These findings have led a number of researchers to suggest that hallucinations may be dissociative in nature (Longden et al.,

2012; Moskowitz & Corstens, 2007; Moskowitz et al., 2009). According to this perspective, hallucinations are not necessarily pathognomonic of schizophrenia but represent a dissociative and most likely trauma-related symptom irrespective of diagnosis. However, rather surprisingly, we found no significant relationship between hallucinations and dissociation when utilizing the SCID-D-R (both total score and subscales). Although we did find a significant correlation between dissociation and hallucinations and that dissociation significantly mediated the relationship between childhood trauma and hallucinations when the DES-II was used. Given the measurement issues associated with the use of the DES in those with psychotic disorders (discussed in Section 4.4), our findings suggest that whether psychotic symptoms, and especially hallucinations are essentially dissociative in nature requires further theoretical elaboration and testing.

Overall, when our findings are considered in conjunction with the past research outlined in Chapter 4, we recognize that it is worthwhile to the continue to evaluate the relationship between dissociative and psychotic symptoms and the extent of the diagnostic overlap between these two psychiatric conditions. Refining our understanding of the commonalities between dissociative and psychotic phenomena will have profound implications on how we classify (i.e., dimensionally or categorically) and treat these conditions. Given there are increasing suggestions that these two conditions potentially share the same underlying processes and symptom manifestations, how we define and subsequently measure dissociative and psychotic phenomena is also of vital importance.

In reconsidering the validity of the rigid conceptual boundaries, the nature and extent of the co-occurrence between dissociative and psychotic psychopathology could be investigated using novel, bottom-up approaches that adopt a dimensional model of psychopathology (e.g., Brown & Barlow, 2005). For instance, a large-scale factor or cluster analysis of various measures of dissociation (including those that capture both detachment and

compartmentalization) and psychosis could be conducted to examine how specific symptoms, regardless of current diagnostic classifications load together. For example, if psychotic symptoms, especially hallucinations are considered dissociative in nature (e.g., Moskowitz et al., 2009) it may be shown that items reflecting hallucinations or related experiences consistently cluster with or load onto factors that contain certain dissociative items. The findings from such a study may mean that the current conceptualization of these constructs need to be revised to address the issue of 'fuzzy' boundaries. Furthermore, such an approach may also assist in elucidating the reasons for the discrepant findings when using either the SCID-D-R or DES-II in our study. The distances and/or loadings for items associated with both measures could also be examined in relation to each other and with the symptoms of psychosis.

Similarly, Renard and colleagues (2017) proposed using network analysis to clarify the co-occurrence that exists between the psychotic and dissociative symptom domains. As discussed in Section 2.3.3 of this thesis, the network structure model of psychopathology suggests that symptoms are not passive, indicators of latent disease entities, but rather they are dynamic components in a network that can have direct causal effects on the generation of other related symptoms (e.g., Borsboom & Cramer, 2013; Borsboom et al., 2011). To examine the network structure and characteristics of dissociative and psychotic symptoms, Renard et al., (2017) recommend examining the correlational pattern of symptoms in those with psychotic and dissociative disorders and seeing whether these symptom networks differ from each other based on diagnosis and/or other factors. How these networks differ from each other may also be investigated, for instance, differences may be in the characteristics of the symptoms (e.g., hallucination content) or the network structure of symptoms (e.g., which symptoms are more closely associated than others) (Renard et al., 2017). Further studies could also test changes to the networks over time to see whether specific symptoms predict the emergence of other related symptoms (Renard et al., 2017). These research recommendations provided by Renard and

colleagues (2017) represent a novel and useful way to clarify our understanding of the intersections between psychotic and dissociative symptomatology.

10.3 Measurement Issues and Discrepancies

The major discrepancies in findings between the two well-validated measures of dissociation in our study highlights the need to carefully consider how dissociation is measured and quantified in future research. Dell (2009b) suggests that there is a strong likelihood that the DES and other instruments of dissociation measure different aspects of the dissociative experience. These discrepancies in measurement place limitations on our ability to accurately interpret dissociation scores in existing and future research. Considering that the total scores of the DES-II and SCID-D-R correlated only modestly in our study ($\rho = .40$), it may mean that these two measures are measuring different aspects of dissociation. Indeed, one difference between the two measures that potentially explains the differential findings concerns the measurement of absorption.

The absorption subscale of the DES measures experiences associated with preoccupation or becoming engrossed with an internal or external event leading to distraction from and/or the blocking of the surrounding world (Carlson & Putnam, 1993). Items on the absorption subscale include for example, not being sure whether things you remember happening really did happen or whether you just dreamt them, becoming so engrossed in a story that you are unaware of other events happening around you, becoming so involved in a fantasy or daydream that it feels as though it were really happening to you, and sometimes sitting, staring off into space, thinking of nothing, and being unaware of the passage of time (Carlson & Putnam, 1993). Absorption as measured by the DES, is a dimensional trait. Most people have experienced some degree of absorption in their everyday lives (e.g., daydreaming,

imaginative involvement), and some people demonstrate higher levels of the trait (Dell, 2009b).

Given the prevalence of absorption in the general population, several researchers have questioned the clinical relevance of the construct and even its classification as a dissociative phenomenon (Dell, 2006; Steele, Dorahy, van der Hart & Nijenhuis, 2009; van der Hart et al., 2004; Waller et al., 1996).

While the DES contains a subscale specifically designed to measure absorption, the SCID-D-R does not. This difference in the measurement of absorption may have played a role in producing the discrepancies in our findings. In this thesis, hallucinations were not associated with the total SCID-D-R score nor with any other SCID-D-R subscale, however, hallucinations had the strongest correlation with the absorption subscale of the DES-II ($\rho = .34$), although this was not significant following Bonferroni-adjustments to the *p*-value. The measurement of absorption might be of particular significance given previous studies have found positive associations between the absorption subscale and hallucinations in those with psychosis (e.g., Perona-Garcelán et al., 2008; 2010; 2011; 2013 Perona-Garcelán, Carrascoso-López et al., 2012; Perona-Garcelán, García-Montes et al., 2012; Spitzer et al., 1997; Startup, Startup & Sedgman, 2008) and in the general population (e.g., Berry et al., 2018; Cole et al., 2016; Glicksohn & Barrett, 2003; Morrison & Petersen, 2003). These researchers suggest that those with hallucinations unlike those with no hallucinations may have an attention style that focuses on the self and internally-generated, private events (i.e., absorption). This self-focus may be felt very intensely, with a distorted sense of reality, thus impeding discrimination between self and externally-generated events leading to increased hallucinatory experience (Perona-Garcelán, García-Montes et al., 2012). Therefore, given that different measures of dissociation likely capture different aspects of the dissociative experience, and these various aspects of dissociation potentially have distinct relationships with psychotic symptoms, it is imperative

that when selecting instruments to include in a study, researchers fully consider what precise facet of the construct their chosen measures are quantifying.

The inclusion of absorption in the DES-II is not the only possible explanation for the disparate findings in this thesis. Another possibility concerns the difference in scoring methodology between the two measures (Olino & Klein, 2015). The SCID-D-R is a clinician-rated measure and as such is prone to potential biases such as the observer-expectancy effects, where raters may bias responding by subtly, and often unconsciously communicating their expectations to the individual being rated (Hamilton, Sherman & Ruvolo, 1990). On the other hand, the DES-II is a self-report measure. At first glance the use of self-report in this setting may seem to be the best methodology for obtaining information about inner experiences. However, self-report methods are also prone to measurement issues. Issues such as social desirability bias, self-perception and the effect of acute emotional states are well known phenomena that can result in biased responding (Olino & Klein, 2015).

These differences in measurement format between clinician-rated and self-report instruments of dissociation may be particularly pronounced in studies of adolescents and young people. While the SCID-D and DES demonstrate good convergent validity in adult samples (van Ijzendoorn, & Schuengel, 1996), several studies have found poor congruence between the SCID-D and self-report measures of dissociation (i.e., the adolescent version of the DES and dissociation items on the Response Evaluation Measure for Youth - 71) in adolescent populations (Carrion & Steiner, 2000; Şar et al., 2014). As of writing, it is not clear whether and how these issues affect response sets for each of the measures, but given the pervasive nature of these measurement issues, further comparative work between the two measures and in both adult and young adult populations is warranted.

10.4 Clinical Implications for Childhood Trauma and FEP

Previous studies have found that a significant proportion of those with FEP report a history of childhood trauma with rates of between 50% and 89% (Bendall et al., 2013; Compton et al., 2004; Greenfield et al., 1994; Neria, Bromet, Sievers, Lavelle & Fochtmann, 2002; Trauelsen et al., 2015). Furthermore, studies have shown that PTSD is also a common experience in FEP, with prevalence rates ranging from 27% to 39% (Bendall et al., 2012; Neria et al., 2002). The clinical picture of an individual with FEP and a history of childhood trauma is found to be one of greater distress and disability, with more severe psychopathology (e.g., psychosis, depression and PTSD), increased suicidality, poorer functioning and service engagement (Bendall et al., 2013; Bendall, Alvarez-Jimenez, Killackey & Jackson, 2018). Therefore, the call for routine screening and assessment of trauma exposure and trauma-related symptoms in those presenting to early psychosis treatment settings has been much needed and well established (Bendall, Alvarez-Jimenez, Nelson & McGorry, 2013; Morrison, Read & Turkington, 2005; National Institute for Health and Care Excellence (NICE), 2014). The prevalence of childhood trauma in our study (53%) was comparable to those of past studies and offers additional support for routine screening and assessment. In extending the recommendations for routine assessment in early psychosis services, the need for a trauma-informed care approach when addressing and managing the psychological sequelae of these traumatic experiences has further been raised (Bendall et al., 2018).

Recently, a Trauma-Informed Psychotherapy for Psychosis (TRIPP) was developed and trialed at the Early Psychosis Prevention and Intervention Centre (EPPIC) in Melbourne, Australia. TRIPP is a therapeutic intervention designed to assess for, provide psycho-education and formulation for the symptoms of PTSD and other sequelae of trauma. TRIPP can be integrated with the standard case management offered to attendees of EPPIC (Bendall, Alvarez-

Jimenez, Killackey & Jackson, 2018). Briefly, TRIPP emphasizes two intervention strategies that can be delivered concurrently. One strategy aims to address concerns regarding safety and risk as well as build resources for emotional coping and distress tolerance. These skills are developed so that the individual can better cope with discussing their trauma and related experiences. The second strategy involves assessment and case formulation around understanding the relationship between the individual's trauma/s and their symptoms. The assessment, formulation and psychoeducation of symptoms associated with PTSD, dissociation and psychosis could be delivered at any stage during TRIPP. For a detailed rationale and outline of TRIPP see (Bendall et al., 2018).

Several findings from this thesis emphasizes the importance of assessing and addressing experiences of dissociation within trauma-informed care approaches in FEP treatment settings. We found that clinical levels of dissociative symptoms were significantly more frequent in the group with a history of childhood trauma (88%) compared to those with no trauma history (13%). We further found a robust relationship between childhood trauma and all measures of dissociation included in this thesis as well as a high prevalence of clinically-significant dissociative symptoms. Our results are consistent with of a multitude of past studies that have found a significant relationship between dissociation and childhood trauma in those with psychosis and that those with psychosis and a history of childhood trauma report greater frequency and severity of dissociative symptoms than those with no trauma history (e.g., Greenfield et al., 1994; Perona-Garcelán et al., 2010; Schroeder et al., 2016). Taken together, these findings offer support for the recommendation that dissociative symptoms should likewise be routinely screened and assessed, especially in cases where trauma is disclosed or suspected (e.g., Kilcommons & Morrison, 2005; Newman-Taylor & Sambrook, 2013; Rafiq et al., 2018).

Addressing dissociative symptoms in the context of trauma-informed treatment might be of vital importance for a number of reasons. Firstly, in those with PTSD, the severity of detachment dissociation is associated with increased suicidality, greater symptom severity, poorer functional outcomes and increased chronicity of the disorder (Stein et al., 2013). Furthermore, several studies have found that high levels of dissociation can affect the effectiveness of several standard treatment approaches to PTSD, such as cognitive processing therapy, skills training in affective and interpersonal regulation, narrative storytelling and eye movement desensitization and reprocessing (Bae, Kim & Park, 2016; Cloitre, Petkova, Wang & Lu, 2012; Price et al., 2014; Resick, Suvak, Johnides, Mitchell & Iverson, 2012). Those with higher levels of dissociation demonstrate poorer initial responses to intervention (Price et al., 2014) and worse treatment outcomes (Bae et al., 2016; Resick et al., 2012). Moreover, interventions that reduced initial levels of dissociation were associated with improved treatment gains over time (Cloitre et al., 2012). Therefore, addressing symptoms of dissociation in those receiving trauma-informed care may lead to better responses to intervention and improved outcomes.

Symptoms of dissociation and how they relate to a person's psychotic symptoms should also be assessed within trauma-informed treatment approaches in FEP. Although in this present thesis the relationship between childhood trauma and the specific psychotic symptom mediated by dissociation differed depending on the measure of dissociation used, our findings overall still suggest that experiences of dissociation are associated with symptoms of psychosis. Therefore, the relationship between dissociation and psychosis should also be considered, especially when treating those with a history of trauma. In some cases, dissociation may be a factor contributing to the maintenance of psychotic symptoms or to the distress associated with psychosis. Therefore, a failure to address dissociative processes may impede the effectiveness of treatment (Newman-Taylor & Sambrook, 2013). In the initial stages of intervention, whether

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a specific type of dissociation and/or how a person's experience of dissociation might be impacting on the development and perpetuation of psychotic symptoms could be assessed and utilized in subsequent case formulation and treatment planning where appropriate (Newman-Taylor & Sambrook, 2013). These formulations are likely to be highly personalized and idiosyncratic. As outlined in the TRIPP protocol (Bendall et al., 2018), other techniques such as psychoeducation or constructing a timeline of major events might assist in understanding the relationship between an individual's experience of trauma and their dissociative and psychotic symptoms. For example, psychoeducation could be employed to support the development of insight into how a person's dissociative and psychotic symptoms are maintained. Overall, our finding suggest that symptoms of dissociation should be recognized and addressed at the appropriate phase of trauma-informed treatment in FEP.

10.5 Study Limitations

Findings from the present study should be interpreted with a number of study limitations in mind. Firstly, the SCID-D-R was designed to assess and diagnose dissociative disorders in adult populations and has not been formally validated in children and adolescents. At present no diagnostic tool for dissociative disorders has been validated for children and adolescents (Şar, Middleton & Dorahy, 2012; Silberg, 2004). Despite this, several studies have utilized the SCID-D-R on children and adolescents and found it capable of diagnosing cases of dissociative disorders and symptoms in these populations (e.g., Carrion & Steiner, 2000; Şar et al., 2014; Steinberg & Steinberg, 1995). One of the main issues with diagnosing dissociative disorders in children and adolescents is the potential confusion with developmental issues (Steinberg & Steinberg, 1995). For example, through the normal course of identity formation, it is not unusual for teenagers to experience sudden changes in mood, experimentation with

outward appearance, and alterations in friendship or social patterns that reflect the young person's search for identity. However, in cases of DID, these different developmental areas may be assigned to separate personality fragments or alters (Steinberg & Steinberg, 1995). The semi-structured design of the SCID-D-R allows some flexibility in the assessment to distinguish between normative, developmental issues associated with normal maturation and those related to dissociative processes (Steinberg & Steinberg, 1995). This flexibility makes the SCID-D-R a suitable option for diagnosing dissociative disorders and symptoms in young people. The validity of the SCID-D-R for use with children and adolescents may be less of an issue for our study given the average age of our sample was 20.18 ($SD = 2.69$) years and only $n = 22$, (33%) of participants were 18 years or younger.

Secondly, there were several limitations related to the training and administration of the semi-structured interviews included in the study, particularly the PANSS. For instance, Opler, Yavorsky and Daniel (2017) recommended that trainee ratings of the PANSS should be compared to 'gold standard' ratings for fidelity and any outlying scores discussed to optimize inter-rater reliability. Whilst the interviewers did undergo training as described in Section 6.5.3, the approach was not as stringent as those described in Opler et al., (2017). Furthermore, an additional limitation was that inter-rater reliability was not systematically assessed as part of this research. The lack of data regarding the reliability of scoring between raters means that the results of the study should be interpreted with caution. Additionally, in the current study we assessed and rated the PANSS based on symptoms that occurred over the last two weeks rather than over the last week which is the typical timeframe adopted in other studies. It is unclear how this anomaly in the administration of the PANSS might affect comparability with past studies. However, considering that participants who were included in the study were 'clinically stabilized', the variability in symptom severity over a one- or two-week period is unlikely to be too extreme. The use of clinical stability as a condition of referral to the study may have

skewed the sampling and our sample may not be fully representative of all young people who attend early psychosis clinics. However, the clinical stability criteria (see Section 6.3) was used in this study to ensure that participants would be more receptive and willing to be approached for research and would be able to cope with and complete the assessment.

Finally, while the sample size (n =66) obtained for the current study is in line with most other studies of dissociation in groups with psychosis, in terms of epidemiology and studies investigating the prevalence rates of disorders, our sample size might be considered small. This places some limitations on our ability to make generalizations about the prevalence rates of dissociative disorders and clinically-significant dissociative symptoms in other groups with FEP. Future studies could examine the prevalence rates of dissociative disorders and symptoms by recruiting larger samples across multiple early psychosis clinics to obtain a more representative sample.

10.6 Future Directions

Several key directions for future research have already been outlined in this chapter. However, there are a number of additional avenues for future research that arise from our findings. The discrepant findings between the DES-II and SCID-D-R would benefit from further inquiry to clarify the cause of the differential findings. The discrepancy between the DES-II and SCID-D-R raises questions of validity. In general, it would be worthwhile to examine the validity of each of these measures of dissociation by examining the extent to which biases associated with each form of measurement (e.g., observer-expectancy effects, acute mood states) affect responding. Such research would help to clarify whether either measure is deficient in the measurement of dissociation and would help pave the way for superior methods

of measurement in future studies and an understanding of the limitations of studies already conducted.

Further research could also examine the validity of each measure by examining the extent to which they concur with other phenomenological or observational markers of dissociation. The congruity between scores on the various subscales of dissociation and behavioral indicators could be rated and assessed by qualified observers. For example, higher scores on scales measuring dissociative amnesia and identity alteration may correspond more highly with frequent and/or sudden switches in mood, actions and reactions to events. Higher scores on measures of depersonalization or detachment may correspond with greater incidences of 'blanking' or 'spacing out' behaviors.

While research into the neuropsychological basis of dissociative symptoms is still in its infancy and requires further investigation, this avenue of research could provide an additional source of validation. As discussed in Section 3.3 of this thesis, dissociative detachment (i.e., depersonalization/derealization) was proposed to have a distinct neurobiological profile which produces a mental state characterized by vigilance, alertness and emotional numbing (Holmes et al., 2005). Studies of those with depersonalization disorder have found reduced activations in areas of the brain associated with emotional experience and increased activity in areas associated with emotional regulation compared with normal and clinical controls, (Phillips et al., 2001; Sierra et al., 2002). Higher depersonalization was negatively correlated with levels of noradrenaline (Simeon et al., 2003). In terms of dissociative 'compartmentalization', a glucose Positron Emission Tomography (PET) study of those with dissociative amnesia and severe episodic autobiographical memory deficits found significant hypo-metabolic activity in the right temporo-frontal region and under-activation in the right infero-lateral prefrontal cortex (Brand et al., 2009). The neurophysiological profile of those with DID has also been investigated (see Dorahy et al., 2014 for a review). Briefly, in an early study using single

emission computerized tomography (SPECT) Saxe and colleagues (1992) found that alterations in personality states were associated with significant fluctuations in blood-flow to the right temporal lobe. More recently, Wolk and colleagues found that 'switching' between alters in DID was associated with increased activation in the primary motor and sensory cortices, prefrontal and frontal areas and the nucleus accumbens (Savoy, Frederick, Keuroghlian & Wolk, 2012; Wolk, Savoy & Frederick, 2012). Furthermore, those with DID were found to have reduced brain volume in the para-hippocampal gyrus and this decreased volume was associated with both psychoform and somatoform dissociation (Ehling, Nijenhuis & Krikke, 2007). Although further investigation is required, if the neurophysiological pattern/s associated with a particular dissociative symptom or type coincide with scores on the relevant subscale or measure, then this concordance can provide external validation for both the instrument and the dissociative construct under examination.

While the findings in our study point to an association between childhood trauma and psychosis and a mediating effect of dissociation, it is worth noting that the mediating effects were not large. This suggests that while dissociation plays a role in the relationship between childhood trauma and psychotic symptoms, it is not the sole factor. Furthermore, it reflects that the pathways from childhood trauma to psychosis are likely to be complex and heterogeneous. In a recently published systematic review, Williams and colleagues (2018) identified several 'families' of variables that putatively mediate the relationship between childhood trauma and psychosis. The authors found the most robust evidence for mediating variables associated with (1) posttraumatic sequelae such as dissociation and PTSD symptoms, (2) affective dysregulation and dysfunction such as depression, anxiety, poor emotional regulation and insecure attachment styles (3) maladaptive cognition, such as negative self-esteem and beliefs about the self and others. Less robust evidence was found for factors associated with (4) the appraisal of life stressors and negative circumstances and (5) substance misuse as a mediator

of the relationship between childhood trauma and psychosis was not supported by the current evidence (Williams, Bucci, Berry & Varese, 2018).

Future research would benefit from the continued examination of the mediating role of dissociation alongside other factors that have been implicated in the relationship between childhood trauma and psychosis. Examples of such factors include those evaluated in Williams et al., (2018) and those raised in Sections 4.2 and 4.3 of this thesis, for example insecure attachment styles (e.g., Berry et al., 2018; Pearce et al., 2016), maladaptive schemas (Bortolon et al., 2017) and metacognitive beliefs (Perona-Garcelán, García-Montes et al., 2012).

Furthermore, symptoms and experiences associated with PTSD, dissociation and psychosis could also be investigated. For instance, Hardy (2017) proposed a multifactorial model of posttraumatic stress in psychosis. In brief, the central tenet of the model is that three types of trauma-related vulnerability factors (i.e., emotional regulation and attempts to survive trauma, episodic memories and personal semantic memories) generate two types of intrusions (i.e., anomalous experiences and intrusive traumatic memories). The interplay between these intrusions themselves, the appraisals of these intrusions and the strategies employed to cope with these intrusions give rise to experiences of psychosis (Hardy, 2017).

The effect of dissociative experiences on various stages of this model could be tested to gain a more precise understanding of the role of dissociative mechanisms on the relationship between trauma and psychosis. For example, dissociative detachment is proposed as one potential driver of anomalous intrusions. Habitual dissociative reactions to perceived threat impact detrimentally on sensory-perceptual processes that lead to the intrusion into consciousness of anomalous experiences (Brown, 2006; Hardy, 2017). These anomalous experiences and wrongful beliefs about the source of these anomalous experiences are believed to underlie hallucinations and delusions (Hardy, 2017; Moskowitz et al., 2009).

Another aspect of PTSD that could be investigated involves re-experiencing and dissociation. Peri-traumatic dissociation is believed to impede the encoding of memories at the time of the traumatic event, leading to the formation of episodic memories that are often, fragmented, decontextualized and disorganized (Terr, 1991; Zoellner, Alvarez-Conrad & Foa, 2002). These disorganized and decontextualized memories are believed to be a source of posttraumatic re-experiencing (Hardy, 2017; Zoellner et al., 2002). Posttraumatic re-experiencing has been found to predict hallucination-proneness in a study of non-clinical participants (Gracie et al., 2007). Further examination of the combined effect of these psychological mechanisms and dissociation on the relationship childhood trauma and psychosis will enrich our understanding of the putative underlying process.

Finally, the present study was not designed with causal inference in mind. A well-designed longitudinal study examining whether and in what circumstances psychotic symptoms predate dissociative symptoms or vice versa would help to clarify whether psychosis should be seen as a mediating variable between childhood trauma and dissociation or whether dissociation should be seen as a mediating variable between childhood trauma and psychosis, as it was in the present study.

10.7 Conclusions

The findings of the present thesis contribute to the literature in a number of ways. We utilized a clinician-administered instrument as an alternative measure of dissociation to the ubiquitous DES to (1) investigate the prevalence of dissociative disorders and clinical symptoms in a FEP cohort, (2) replicate and validate past findings regarding the relationship between childhood trauma, dissociation and psychotic symptoms, and to (3) explore the relationship between types of dissociation (i.e., compartmentalization and detachment) and

symptoms of psychosis (i.e., hallucinations and delusions). Firstly, we found the existence of a subgroup of people within early psychosis who also meet criteria for a dissociative disorder. Furthermore, we found that a substantial number of those with FEP experience clinical levels of dissociative symptoms and these symptoms occur more frequently in those with a history of childhood trauma. Secondly, we found using a clinician-rated measure of dissociation that there is a significant relationship between childhood trauma and dissociation, and that dissociation mediated the relationship between childhood trauma and delusions. However, there were significant discrepancies in results depending on whether the SCID-D-R or the DES-II was used to quantify dissociative experiences. Lastly, delusions significantly correlated with both detachment and compartmentalization dissociation, although only the relationship with compartmentalization remained significant at Bonferroni-corrected significance levels. Again, there were significant discrepancies in findings between the SCID-D-R and DES-II in regards to the relationships between the various dissociation subscales and hallucinations and delusions.

Given there were major discrepancies in results based on the measure of dissociation used, perhaps one of the most significant implications of this thesis is that it highlights the need for future research to carefully consider the validity of each measure included in a study and to select tools that validly capture the construct of interest. Updated psychometric studies of these various measures of dissociation may also be warranted to reassess and review precisely what each measure is capturing. Ongoing evaluation of these measures may be especially important considering that the concept and definition of dissociation is continuing to evolve as researchers attempt to reach an accepted consensus. While the specific relationships between dissociation, hallucinations and delusions varied depending on the measure of dissociation used, significant associations and mediations were still found between dissociation and psychosis. Overall, our findings provide support for the now widely accepted biopsychosocial model of psychotic

disorders. Our current understanding of psychotic disorders and especially schizophrenia, has moved past bio-reductionistic, disease models and now recognizes that psychotic disorders are the product of a complex etiological interplay between biological, genetic factors and psychosocial, environmental factors such as early trauma (e.g., Moskowitz, 2011; Ross, 2007; van Os, Kenis & Rutten, 2010).

The findings from our study have relevant and practical implications for early psychosis. The use of a FEP sample makes it possible to infer that dissociative symptoms are prevalent and are potentially impacting on psychotic symptoms early in the course of the disorder. We support the recommendation that in cases where traumatic experiences are disclosed or suspected, dissociative symptoms should be routinely screened and assessed for in early psychosis treatment settings. Clinicians should receive support and training to evaluate and treat dissociative symptoms in FEP. Future trauma-informed treatment protocols for early psychosis might also benefit from including sections on recognizing and addressing dissociative experiences. It is hoped that with the implementation of these recommendations to current clinical practice, treatment outcomes for a subset of people with early psychosis who presently have unmet mental health needs will be improved. Given that childhood trauma is associated with greater disability and distress in those with FEP, it is hoped that a better understanding of the potential mechanisms underlying the relationship between trauma and psychosis such as dissociation and the nature and extent of the co-occurrence between psychotic and dissociative symptomatology will ultimately lead to more informed and effective interventions for those impacted.

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Appendix A: Melbourne Health HREC Approval Letter

PO Royal Melbourne Hospital

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ABN 73 802 706 972

OFFICE **F**OR **R**ESEARCH

MELBOURNE HEALTH

SITE SPECIFIC ASSESSMENT (SSA) AUTHORISATION

APPROVAL TO CONDUCT A RESEARCH PROJECT AT MELBOURNE HEALTH

Dr. Sarah Bendall
MelbUni: Centre for Youth Mental Health 35 Poplar
Road
PARKVILLE
VIC 3052

28 April 2014

Dear Dr. Sarah Bendall

Local Project Number: 2014.014

Study Title: Trauma and Psychosis - Exploring the Role of Post-Traumatic Intrusions, Avoidance and Dissociation.

SSA Authorisation Date: 28 April 2014

HREC Approval Date: 25 March 2014

I am pleased to advise that the above project is approved to be conducted at Melbourne Health. This approval is subject to compliance with any conditions imposed by the reviewing HREC.

SSA Approved Documents:

- *Melbourne Health HREC Approval Letter, dated 25 March 2014 and all documents therein.*
- *Protocol, Version 2, dated 24th February 2014.*
- *Participant Information and Consent Form, Version 2, dated 24th February 2014. Participant Information*
- *and Consent Form – Parent/Guardian, Version 2, dated 24th February 2014.*
- *Research Agreement between Melbourne Health and Orygen Youth Health Research Centre.*

Research governance

You are required to notify the Office for Research of:

1. The actual start date of the project at Melbourne Health.
2. Any amendments to the project after these have been approved by the reviewing HREC
3. Any adverse events involving patients of Melbourne Health, in accordance with the Melbourne Health Guidelines for Monitoring and Reporting of Safety in Clinical Trials Involving Therapeutic Products and Other Clinical Research, July 2009.
4. Any unforeseen events.
5. Any changes to the indemnity, insurance arrangements or Clinical Trial Research Agreement for this project. This includes changes to the project budget or other changes which may have financial or other

resource implications for Melbourne Health. Your inability to continue as Principal Investigator or any other change in research personnel involved in the project.

6. Any other matters which may impact the conduct of the project at Melbourne Health.

You are also required to submit to the Office for Research:

7. A copy of the TGA acknowledgement letter in respect of the CTN notification (if applicable).
8. An Annual Progress Report every 12 months (or more frequently as requested by the reviewing HREC) for the duration of the project. This report is due on the anniversary of HREC approval. Continued SSA and HREC approval are contingent on receipt of an annual report by the reviewing HREC and the Research Governance Office.
9. A comprehensive Final Report upon completion of the project.

The Office for Research may conduct an audit of the project at any time.

Please refer to the Office for Research website to access forms such as the Amendment Form, Annual Report/Final Report Form, Guidelines for Monitoring and Reporting of Safety in Clinical Trials Guidelines and Adverse Event Report Forms, and other information and news concerning research at Melbourne Health:
http://www.mh.org.au/www/342/1001127/displayarticle/1001352.html

Please Note: Template forms for reporting Amendments, Adverse Events, Annual Report/Final Reports, etc. can be accessed from: www.health.vic.gov.au/cchre.

Yours sincerely,
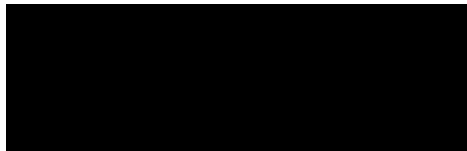
Dr Angela Watt
Director Research Governance and Ethics

Appendix B: Monash University HREC Approval Letter

MONASH University

Monash University Human Research Ethics Committee (MUHREC)
Research Office

Human Ethics Certificate of Approval

This is to certify that the project below was considered by the Chair of the Monash University Human Research Ethics Committee. The Chair was satisfied that the proposal meets the requirements of the *National Statement on Ethical Conduct in Human Research* and has granted approval.

Project Number:	CF14/1477 - 2014000688
Project Title:	Trauma and Psychosis – Exploring the Role of Post-Traumatic Intrusions, Avoidance and Dissociation
Chief Investigator:	Dr Katherine Lawrence
Approved:	**From:** 26 May 2014 **To:** 26 May 2019

Terms of approval - *Failure to comply with the terms below is in breach of your approval and the Australian Code for the Responsible Conduct of Research.*

1. Approval is only valid whilst you hold a position at Monash University and approval at the primary HREC is current.
2. **Future correspondence:** Please quote the project number and project title above in any further correspondence.
3. **Final report:** A Final Report should be provided at the conclusion of the project. MUHREC should be notified if the project is discontinued before the expected date of completion.
4. **Retention and storage of data:** The Chief Investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.
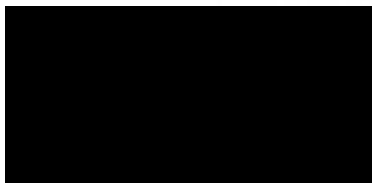
Professor Nip Thomson
Chair, MUHREC

cc: Ms Panela Sun, Dr Sarah Bendall, Dr Mario Alvarez-Jimenz, Dr Craig MacNeil, Ms Natalie Peach, Dr Simon Cropper

Appendix C: Ethics Admendment Approval Letter

The Royal
Melbourne Hospital
Parkville Victoria

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OFFICE FOR RESEARCH

APPROVAL OF AMENDMENT

9th September 2015

Dear Dr Sarah

Bendall

Local Project Number: 2014.014

Research Title: Trauma and Psychosis - Exploring the Role of Post-Traumatic Intrusions, Avoidance and Dissociation.

I am pleased to advise that the amendment to the above project has been reviewed and approved by the Melbourne Health HREC and is approved to be conducted at Melbourne Health.

Amendment Approval Date: 9th September 2015

Approved Documents:

• Protocol Amendment 1, dated 9th July 2015

Please refer to the Melbourne Health Office for Research website to access guidelines and other information and news concerning research at: http://www.mh.org.au/www/342/1001127/displayarticle/1001352.html

Please Note: Template forms for reporting Amendments, Adverse Events, Annual Report/Final Reports, etc. can be accessed from:: www.health.vic.gov.au/cchre.

For any queries about this matter, please contact Ms Jessica Turner on ██████████ or via email on: ███████████████████

Yours sincerely,

████████████████████

Ms Jessica Turner
Manager - Human Research Ethics Committee Ph:
██████████

<u>Demographics</u>

BASIC INFORMATION

1   Rater   _____

2   Sources of information: a   Patient

                                        b   File (clinical)

     (mark all relevant sources)   c   Informant

                                        d   EPPIC Staff

3   Sex   1 = M   2 = F

4   Marital status   1   Married/De facto

                                  2   Separated

                                  3   Divorced

                                  4   Widowed

                                  5   Never married

5   Number of children: 0 / 1 / 2 / 3 / 4 / 5 / _____

6   Accommodation on referral: 0   None

                                  1   Crisis accommodation

                                  2   Hotel/ SAH

                                  3   Rented room

                                  4   Rented flat/house

                                  5   Own flat/ house

                                  6   House/flat with family of origin

                                  7   Institution

                                  8   Other (specify) _____

7   Persons with whom living on referral and number: 0   Alone   Number

     (mark all relevant numbers)   1   Spouse/De facto   _____

                                        2   Parent(s)   _____

                                        3   Son/daughter   _____

                                        4   Sibling(s)   _____

                                        5   Other relative(s)   _____

                                        6   Friend(s)   _____

                                        7   Institution/boarding   _____

                                        8   Other (specify) _____   _____

8 Employment Status:

   0 Unemployed

   1 Working part-time/casual

   2 Working full-time

1 Yes

9   Education: a   Current study status: 0 Not studying
                      Include question about work status   1 Studying part-time
                                                            2 Studying full-time

     Details (what year, course type, etc)_____
     _____
     _____

                 b   Highest year <u>completed</u> at school: 6 (or below)
                                                                7
                                                                8
                                                                9
                                                                10
                                                                11
                                                                12
                                                                VCE

                 c   Additional qualifications: 0 Nil
                                                     1 Trade or technical training
                                                     2 Tertiary diploma
                                                     3 Tertiary degree
                                                     4 Currently secondary school
                                                     5 Currently tertiary education
                                                     6 Incomplete tertiary/technical training

10   Religion: 0 None
                                                     1 Protestant
                                                     2 Roman Catholic
                                                     3 Christian Orthodox
                                                     4 Muslim
                                                     5 Jewish
                                                     6 Other (specify)_____
                                                     7 Buddhist

11   Country of birth: _____
12   Country of birth <u>mother</u>:   _____
13   Country of birth <u>father</u>:   _____
14   Year of first arrival in Australia: _____
15   Ethnic self-identification: _____
16   Main language spoken as a child: _____
17   Command of English: 1 None
                                              2 Poor
                                              3 Fair
                                              4 Good
                                              5 Native speaker

18   Significant chronic medical illness(es):   0 No   1 Yes

Specify_____

_____

20   Medication compliance: 0   N/A

1   Complete non-compliance

2   Irregular to very irregular compliance

3   Reasonable compliance

4   Full compliance

-9   Unknown/Missing

_____

HEALTH INFORMATION

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Medication use:

a. Have you used medication in the last 6 months?   0 No   1 Yes
b. What kind of medication was it?   _____
c. For how long did you use it?   _____

21   Family history of mental illness: 0 No   1 Yes   2 Unknown

	Psychotic illnesses (schizophrenia, bipolar disorder)		Non-psychotic illnesses (unipolar depression, anxiety disorder, OCD, others)		Overall score
	No.	Type (s)	No.	Type (s)	
Number of first degree relatives (siblings, parents)					
Number of second Degree relatives (grandparents, aunts, uncles)					

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IMPORTANT DATES

23 Date of birth:

24 Date of registration:

Number of third degree relatives (cousins, others)					
Overall score					

22. On average, how long are your appointments with your OCM? _____

Appendix E: Dissociative Experiences Scale-II (DES-II)

Dissociative Experiences Scale-II (DES-II)
Eve Bernstein Carlson, Ph.D. & Frank W. Putnam, M.D.

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 90 100%
　　　　　　　　　(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%

Dissociative Experiences Scale II (DES II) Description and Interpretation

Description: The Dissociative Experiences Scale II (DES II) is a copyright-free, screening instrument. According to its authors, Carlson and Putnam, "it is a brief, self-report measure of the frequency of dissociative experiences. The scale was developed to provide a reliable, valid, and convenient way to quantify dissociative experiences. A response scale that allows subject to quantify their experiences for each item was used so that scores could reflect a wider range of dissociative symptomatology than possible using a dichotomous (yes/no) format." (see Dissociation 6 (1): 16-23)

Interpretation: The Dissociative Experiences Scale II (DES II): When scoring, drop the zero on the percentage e.g. 30%=3; 80%=8 then add up single digits for client score Mean DES Scores Across Populations for Various Studies

General Adult Population	5.4
Anxiety Disorders	7.0
Affective Disorders	9.35
Eating Disorders	15.8
Late Adolescence	16.6
Schizophrenia	15.4
Borderline Personality Disorder	19.2
PTSD	31
Dissociative Disorder (NOS)	36
Dissociative Identity Disorder (MPD)	48

Items from the DES for Each of the Three Main Factors of Dissociation:

Amnesia Factor: This factor measures memory loss, i.e., not knowing how you got somewhere, being dressed in clothes you don't remember putting on, finding new things among belongings you don't remember buying, not recognizing friends or family members, finding evidence of having done things you don't remember doing, finding writings, drawings or notes you must have done but don't remember doing. Items — 3, 4, 5, 8, 25, 26.

Depersonalization/Derealization Factor: Depersonalization is characterized by the recurrent experience of feeling detached from one's self and mental processes or a sense of unreality of the self. Items relating to this factor include feeling that you are standing next to yourself or watching yourself do something and seeing yourself as if you were looking at another person, feeling your body does not belong to you, and looking in a mirror and not recognizing yourself. Derealization is the sense of a loss of reality of the immediate environment. These items include feeling that other people, objects, and the world around them is not real, hearing voices inside your head that tell you to do things or comment on things you are doing, and feeling like you are looking at the world through a fog, so that people and objects appear far away or unclear. Items — 7, 11, 12, 13, 27, 28.

Absorption Factor: This factor includes being so preoccupied or absorbed by something that you are distracted from what is going on around you. The absorption primarily has to do with one's traumatic experiences. Items of this factor include realizing that you did not hear part or all of what was said by another, remembering a past event so vividly that you feel as if you are reliving the event, not being sure whether things that they remember happening really did happen or whether they just dreamed them, when you are watching television or a movie you become so absorbed in the story you are unaware of other events happening around you, becoming so involved in a fantasy or daydream that it feels as though it were really happening to you, and sometimes sitting, staring off into space, thinking of nothing, and being unaware of the passage of time.

Items — 2, 14, 15, 17, 18, 20.

Participant Information Sheet/Consent Form
Health/Social Science Research -*Adult providing own consent*

Orygen – The National Centre of Excellence in Youth Mental Health

Title	Trauma and Psychosis: Exploring the Role of Post Traumatic Intrusions, Avoidance and Dissociation
HREC Number	HREC# 2014.014
Principal Investigator	Dr. Sarah Bendall
Associate Investigator(s)	Pamela Sun and Natalie Peach
Location	EPPIC Clinic (Orygen Youth Health Clinical Program)

Part 1   What does my participation involve?

1   Introduction

You are invited to take part in this research project. You have been invited because you and your case manager have discussed that you have experienced symptoms of psychosis. The research project is examining how past events in your life may be contributing to the experience of your current symptoms.

Your contact details were obtained from your Case Manager in the EPPIC clinic.

This Participant Information Sheet/Consent Form tells you about the research project. It explains the processes involved with taking part. Knowing what is involved will help you decide if you want to take part in the research.

Please read this information carefully. Ask questions about anything that you don't understand or want to know more about. Before deciding whether or not to take part, you might want to talk about it with a relative, friend or local health worker.

Participation in this research is voluntary. If you don't wish to take part, you don't have to.

If you decide you want to take part in the research project, you will be asked to sign the consent section. By signing it you are telling us that you:
-Understand what you have read
-Consent to take part in the research project
-Consent to be involved in the research described
-Consent to the use of your personal and health information as described.

You will be given a copy of this Participant Information and Consent Form to keep.

2   What is the purpose of this research?

Some people with early psychosis have had traumatic experiences in their lives, such as emotional, sexual or physical abuse. The purpose of this project is to explore some of the symptoms that people with early psychosis may be experiencing, and to investigate how these symptoms might be related to traumatic experiences from the past. It is not yet fully understood how symptoms associated with experiencing a trauma might contribute to the development of psychosis. People who experience past trauma can often develop different ways to avoid thinking about traumatic or unpleasant experiences, and we also wish to investigate how some of these tendencies might be related to symptoms of psychosis. By understanding how past trauma and avoidant tendencies relate to symptoms of psychosis, we can contribute towards improved treatments for other people having similar experiences.

The results of this research will be used by two of the researchers, Pamela Sun and Natalie Peach, to obtain Doctor of Psychology in Clinical Psychology and PhD (Clinical Psychology) degrees respectively.

This research has been initiated by the principal researcher, Dr Sarah Bendall.

This research has been funded by Monash University and the University of Melbourne.

3   What does participation in this research involve?

If you consent to being in the study, after signing this participant consent form, participation will involve an interview with a researcher that will take approximately three hours. If you feel that one three-hour session is too long, the session can be split into two separate sessions. The session(s) will involve being asked questions by the researcher about any past traumatic experiences you might have had including questions about sexual, physical and emotional abuse. The researcher will ask you some questions about these experiences but you can choose not to answer these questions if you wish. You will also be asked about your psychotic symptoms, and what the experience of these symptoms is like for you (for example what your symptoms are about, how often they occur, and how much distress they cause you). During the session you will also be asked to fill in some questionnaires, and complete a short (approximately 10 minute) computer task.The computer task will measure your reaction times to a display of numbers.

As part of the assessments, we would also like your permission to look at your clinical file to get information about any medication you are taking and how long you have been at the service.

There are no costs associated with participating in this research project. However, you will be reimbursed $30 for expenses associated with the research project visit.

4
   Other relevant information about the research project

Seventy people with psychosis attending the Orygen Youth Health clinical program will take part in this study. Of these 70 participants, some will have experienced trauma in their past and others will not have. Part of what this study will investigate is how the symptoms of psychosis might differ between people who have experienced a trauma and people who have not.

5   Do I have to take part in this research project?

Participation in any research project is voluntary. If you do not wish to take part, you do not have to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage.

If you do decide to take part, you will be given this Participant Information and Consent Form to sign and you will be given a copy to keep.

Your decision whether to take part or not to take part, or to take part and then withdraw, will not affect your routine care, your relationship with professional staff or your relationship with those treating you OR with Orygen Youth Health.

6   What are the possible benefits of taking part?

We cannot guarantee or promise that you will receive any benefits from this research; however, a possible benefit may include having the opportunity to reflect on some of the symptoms you are experiencing in the context of a supportive environment. Information obtained through the research interview may assist with your treatment and care and may be fed back to the treating team with your permission. The results of this research may improve our understanding of the symptoms of psychosis, which may contribute towards improved treatments for other people having similar experiences.

7   What are the possible risks and disadvantages of taking part?

You may feel that some of the questions we ask are stressful or upsetting. If you do not wish to answer a question, you may skip it and go to the next question, or you may stop immediately. If you become upset or distressed as a result of your participation in the research project, the research team will be able to arrange for you to talk to your case manager. You may prefer to suspend or end your participation in this research if distress occurs.

8   What if I withdraw from this research project?

If you do consent to participate, you may withdraw at any time. If you decide to withdraw from the project, please notify a member of the research team. If you do withdraw, you will be asked to complete and sign a 'Withdrawal of Consent' form; this will be provided to you by the research team.

If you decide to leave the research project, the researchers will not collect additional personal information from you, although personal information already collected will be retained to ensure that the results of the research project can be measured properly and to comply with law. You should be aware that data collected up to the time you withdraw will form part of the research project results. If you do not want your data to be included, you must tell the researchers when you withdraw from the research project.

9   Could this research project be stopped unexpectedly?

This research project may be stopped unexpectedly for a variety of reasons. These may include reasons such as the student researchers discontinuing with their respective courses of study. Another reason may be if an undue amount of distress is experienced by participants of the study. However many studies of a similar nature to this current study have been conducted in the past at Orygen Youth Health without any incident or cause to end the study. Therefore the likelihood that the study will be stopped is low.

10   What happens when the research project ends?

If you would like feedback on your individual results from the assessment, you may ask a member of the research team. Feedback can be provided to you in either a verbal or written format. If you would like we will provide you with a summary of the results of the project when the project is concluded. If you would like this summary we will ask you for some contact details so that we can post or email it to you. This is expected to be available in December 2015. We will also publish results of the study in publicly available scientific journals. Generally these can be accessed through institutional libraries.

Part 2   How is the research project being conducted?

11   What will happen to information about me?

By signing the consent form you consent to the research team collecting and using personal information about you for the research project. The personal information that the research team collects and uses is from the interview, questionnaires and computer task that you complete. Any information obtained in connection with this research project that can identify you will remain confidential. Information from the assessments conducted for this study will be kept in a locked filing cabinet at Orygen Youth Health that can only be accessed by the principal researcher, Dr Sarah Bendall and the student researchers on the project. This information will be entered without any identifying information into a computer database, which will be password-protected and only accessed by Dr Bendall and the student researchers. Your data will have a unique code, which will be linked to your contact details, which is kept in a separate password-protected file, for the purpose of contacting you for further information or, with your consent, contacting your for future research projects at Orygen. Only Dr Bendall and the student researchers will have access to the link between the unique code and your contact details.

We are seeking your consent to keep your data stored for future (unspecified) research into youth mental health conducted by Orygen. After all future research is completed, your information will be kept for 5 years after the results of the final study have been reported. After that it will all be destroyed. We would also like to seek your consent to contact you in the future and invite you to participate in any follow-up studies that may be conducted.

We will endeavour to keep all the information that we collect in the assessments strictly confidential. There are some exceptions to this: 1) information from the assessments may be communicated with your case manager to ensure that you receive the best care possible; 2) if we are concerned about risk to yourself or someone else, we may need to discuss this with your case manager and doctor at Orygen; 3) if as a result of the information you disclose in the interview relating to your past trauma or abuse we believe that someone else may be at risk. In some cases we may contact The Department of Human Services about risk to children under the age of 17 years. Mandatory reporting laws require clinicians to report to Child Protective Services any suspected cases of child abuse and neglect (Children, Youth and Families Act 2005 (Vic.)). In cases where abuse is reported, information gathered by researchers is passed on to the clinical team and the appropriate clinical procedures normally used within the mental health service are implemented. This may involve reporting abuse to DHS or other support services. In all cases we will discuss this with you first.

Any information obtained in connection with this research project that can identify you will remain confidential to the best of our ability and will only be used for the purpose of this research project. It will only be disclosed with your permission, except as required by law. We plan to publish group results in scientific journals, speak about them in scientific conferences and talk about them to other people who work in mental health industries in order to help them improve the service they provide to people with psychosis.

The health records and data obtained from this study may be accessed by the Melbourne Health Office for Research to verify the study procedures and conduct.

Information about you may be obtained from your health records held at this and other health organisations for the purpose of this research. By signing the consent form you agree to the research team accessing health records if they are relevant to your participation in this research project.

It is anticipated that the results of this research project will be published and/or presented in a variety of forums. In any publication and/or presentation, information will be provided in such a way that you cannot be identified, except with your express permission.

In accordance with relevant Australian and/or Victorian privacy and other relevant laws, you have the right to request access to the information about you that is collected and stored by the research team. You also have the right to request that any information with which you disagree

be corrected. Please inform the research team member named at the end of this document if you would like to access your information.

Any information obtained for the purpose of this research project that can identify you will be treated as confidential and securely stored. It will be disclosed only with your permission, or as required by law.

We are also seeking your consent to store and use information we gather during this interview with you in any future research projects that might be conducted. By providing your contact details on the consent form below you are consenting to the possibility of being contacted in the future and asked if you would like to participate in any follow-up research.

12   Complaints and compensation

If you suffer any distress or psychological injury as a result of this research project, you should contact the research team as soon as possible. You will be assisted with arranging appropriate treatment and support.

If you have a complaint about the research team, OR any serious event that occurs following your participation in this project, you should talk with your case manager.

13   Who has reviewed the research project?

All research in Australia involving humans is reviewed by an independent group of people called a Human Research Ethics Committee (HREC).
The ethical aspects of this research project have been approved by the HREC of Orygen Youth Health and the HREC of Melbourne Health.
This project will be carried out according to the *National Statement on Ethical Conduct in Human Research (2007)*. This statement has been developed to protect the interests of people who agree to participate in human research studies.

14   Further information and who to contact
The person you may need to contact will depend on the nature of your query. If you want any further information concerning this project or if you have any problems which may be related to your involvement in the project, you can contact:

Research Contact Person:
Name	Dr Sarah Bendall
Position	Principal Researcher
Telephone	██████████
Email	████████████████████

If you have any complaints about any aspect of the project, the way it is being conducted or any questions about being a research participant in general, then you may contact:

Complaints Contact/HREC Executive Officer details:
Name	Ms Jessica Turner
Position	Manager, Melbourne Health Human Research Ethics Committee
Telephone	██████████

Consent Form - *Adult providing own consent*

Title   Trauma and Psychosis: Exploring the Role of Post-
                                            Traumatic Intrusions, Avoidance and Dissociation
HREC Number   HREC# 2014.014
Principal Investigator   Dr Sarah Bendall
Associate Investigator(s)   Pamela Sun and Natalie Peach
Location   Orygen Youth Health Clinical Program

Declaration by Participant

I have read the Participant Information Sheet or someone has read it to me in a language that I understand.

I understand the purposes, procedures and risks of the research described in the project.

I have had an opportunity to ask questions and I am satisfied with the answers I have received.

I freely agree to participate in this research project as described and understand that I am free to withdraw at any time during the project without affecting my future care.

I understand that I will be given a signed copy of this document to keep.

I consent to the storage and use of data provided by me for this research project, as described in the relevant section of the Participant Information Sheet, for (please circle):

  • This specific research project   Y / N
  • Other research that is closely related to this research project Y / N
  • Any future research   Y / N

☐ I understand that information I provide for this research may be disclosed to my case manager, and that mandatory reporting laws require that clinicians report any case of suspected child abuse or neglect to Child Protective Services.

Name of Participant (please print) _____   Signature _____ Date _____

I consent to the possibility of being contacted in the future and invited to take part in any follow-up research (please circle): Y / N

Participant Contact Details   Phone number _____ Email address _____

Declaration by Researcher†

I have given a verbal explanation of the research project, its procedures and risks and I believe that the participant has understood that explanation.

Name of Researcher†(please print) _____   Signature _____ Date _____

†An appropriately qualified member of the research team must provide the explanation of,and information concerning, the research project.
Note: All parties signing the consent section must date their own signature.

Form for Withdrawal of Participation - *Adult providing own consent*

Title   Trauma and Psychosis: Exploring the Role of Post-
                                            Traumatic Intrusions, Avoidance and Dissociation
HREC Number   HREC# 2014.014
Principal Investigator   Dr Sarah Bendall
Associate Investigator(s)   Pamela Sun and Natalie Peach
Location   Orygen Youth Health Clinical Program

Declaration by Participant

I wish to withdraw from participation in the above research project and understand that such withdrawal will not affect my routine care or my relationships with the researchers or Orygen Youth Health.

Name of Participant (please print) _____

Signature _____ Date _____

In the event that the participant's decision to withdraw is communicated verbally, the Senior Researcher must provide a description of the circumstances below.

Declaration by Researcher†

I have given a verbal explanation of the implications of withdrawal from the research project and I believe that the participant has understood that explanation.

Name of Researcher (please print) _____

Signature _____ Date _____

†An appropriately qualified member of the research team must provide information concerning withdrawal from the research project.

Note: All parties signing the consent section must date their own signature.

Participant Information Sheet/Consent Form – Parent/Guardian

Orygen – The National Centre of Excellence in Youth Mental Health

Title	Trauma and Psychosis: Exploring the Role of Post Traumatic Intrusions, Avoidance and Dissociation
HREC Number	HREC# 2014.014
Principal Investigator	Dr Sarah Bendall
Associate Investigator(s)	Pamela Sun and Natalie Peach
Location	EPPIC Clinic (Orygen Youth Health Clinical Program)

Part 1   What does the child's participation involve?

1   Introduction

This is an invitation for the child in your care to take part in this research project, which is called *Trauma and Psychosis: Exploring the Role of Post Traumatic Intrusions, Avoidance and Dissociation*. They have been invited because they and their case manager have discussed that they have experienced the symptoms of psychosis. The research project is examining how past events in your child's life may be contributing to the experience of their current symptoms.

The child's contact details were obtained from their Case Manager in the EPPIC clinic.

This Participant Information Sheet/Consent Form tells you about the research project. It explains the processes involved with taking part. Knowing what is involved will help you decide if you want the child to take part in the research.

Please read this information carefully. Ask questions about anything that you don't understand or want to know more about. Before deciding whether or not the child can take part, you might want to talk about it with a relative, friend or local health worker.

Participation in this research is voluntary. If you do not wish the child in your care to take part, they do not have to.

If you decide you want the child to take part in the research project, you will be asked to sign the consent section. By signing it you are telling us that you:
• Understand what you have read
• Consent to the child taking part in the research project
• Consent to the child being involved in the research described

• Consent to the use of the child's personal and health information as described.

You will be given a copy of this Participant Information and Consent Form to keep.

2   What is the purpose of this research?

Some people with early psychosis have had traumatic experiences in their lives, such as emotional sexual or physical abuse. The purpose of this project is to explore some of the symptoms that people with early psychosis may be experiencing, and to investigate how these symptoms might be related to traumatic experiences from the past. It is not yet fully understood how symptoms associated with experiencing a trauma might contribute to the development of psychosis. People who experience past trauma can often develop different ways to avoid thinking about traumatic or unpleasant experiences, and we also wish to investigate how some of these tendencies might be related to symptoms of psychosis. By understanding how past trauma and avoidant tendencies relate to symptoms of psychosis, we can contribute towards improved treatments for other people having similar experiences.

The results of this research will be used by two of the researchers, Pamela Sun and Natalie Peach, to obtain Doctor of Psychology in Clinical Psychology and PhD (Clinical Psychology) degrees respectively.

This research has been initiated by the principal researcher, Dr Sarah Bendall.

This research has been funded by Monash University and the University and the University of Melbourne.

3   What does participation in this research involve?

If you decide that the child in your care may take part in the research project, after signing this participant consent form, participation will involve your child completing an interview with a researcher that will take approximately three hours. If your child feels that one three-hour session is too long, the session can be split into two separate sessions. The session(s) will involve your child being asked questions by the researcher about past traumatic experiences they may have had including questions about sexual, physical and emotional abused. The researcher will ask your child some questions about these experiences but they can choose not to answer these questions if they wish. Your child will also be asked about their psychotic symptoms, and what the experience of these symptoms is like for them (for example what their symptoms are about, how often they occur, and how much distress they cause). During the session your child will also be asked to fill in some questionnaires, and complete a short (approximately 10 minute) computer task. The computer task will measure their reaction times to a display of numbers.

As part of the assessments, we would also like your permission to look at your child's clinical file to get information about any medication they are taking and how long they have been at the service.
There are no costs associated with participating in this research project, nor will you or your child be paid. However, your child will be reimbursed $30 for expenses associated with the research project visit.

4   Other relevant information about the research project

Seventy people with psychosis attending the Orygen Youth Health clinical program will take part in this study. Of these 70 participants, some will have experienced trauma in their past and other

will not have. Part of what this study will investigate is how the symptoms of psychosis might differ between people who have experienced a trauma and people who have not.

5 Does the child have to take part in this research project?

Participation in any research project is voluntary. If you do not wish for the child to take part, they do not have to. If you decide that they can take part and later change your mind, you are free to withdraw the child from the project at any stage.

If you do decide that the child can take part, you will be given this Participant Information and Consent Form to sign and you will be given a copy to keep.

Your decision that the child can or cannot take part, or that they can take part and then be withdrawn, will not affect their routine care, relationship with professional staff or relationship with those treating your child OR Orygen Youth Health.

6 What are the possible benefits of taking part?

We cannot guarantee or promise that the child will receive any benefits from this research; however, possible benefits may include may include having the opportunity to reflect on some of the symptoms they are experiencing in the context of a supportive environment. Information obtained through the research interview may assist with your child's treatment and care and may be fed back to the treating team with their permission. The results of this research may improve our understanding of the symptoms of psychosis, which may contribute towards improved treatments for other people having similar experiences.

7 What are the possible risks and disadvantages of taking part?

The participant may feel that some of the questions we ask are stressful or upsetting. If they do not wish to answer a question, they may skip it and go to the next question, or they may stop immediately. If the participant becomes upset or distressed as a result of their participation in the research project, the research team will be able to arrange for the participant to talk to their case manager. They may prefer to suspend or end their participation in this research if distress occurs.

8 What if I withdraw the child from this research project?

If you do consent for the child to participate, you may withdraw them at any time. If you decide to withdraw the participant from the project, please notify a member of the research team. A member of the research team will inform you if there are any special requirements linked to withdrawing. If you do withdraw your child, you will be asked to complete and sign a 'Withdrawal of Consent' form; this will be provided to you by the research team.

If you decide that your child is to leave the research project, the researchers will not collect additional personal information, although personal information already collected will be retained to ensure that the results of the research project can be measured properly and to comply with law. You should be aware that data collected up to the time of withdrawal will form part of the research project results. If you do not want the participant's data to be included, you must tell the researchers when withdrawing from the research project.

9 Could this research project be stopped unexpectedly?

This research project may be stopped unexpectedly for a variety of reasons. These may include reasons such as the student researchers discontinuing with their respective courses of study.

Another reason may be if an undue amount of distress is experienced by participants of the study. However many studies of a similar nature to this current study have been conducted in the past at Orygen Youth Health without any incident or cause to end the study. Therefore the likelihood that the study will be stopped is low.

10   What happens when the research project ends?

If you or your child would like feedback on their individual results from the assessment, you or your child may ask a member of the research team. Feedback can be provided to you or your child in either a verbal or written format. If you or your child would like we will provide you or your child with a summary of the results of the project when the project is concluded. If you or your child would like this summary we will ask you or your child for some contact details so that we can post or email it to you or your child. This is expected to be available in December 2015. We will also publish results of the study in publicly available scientific journals. Generally these can be accessed through institutional libraries.

Part 2   How is the research project being conducted?

11   What will happen to information about the child?

By signing the consent form you consent to the research team collecting and using personal information about the child for the research project. Any information obtained in connection with this research project that can identify them will remain confidential. The personal information that the research team collect and use is from the interview, questionnaires and computer task that they complete.

Any information obtained in connection with this research project that can identify your child will remain confidential. Information from the assessments conducted for this study will be kept in a locked filing cabinet at Orygen Youth Health that can only be accessed by the principal researcher, Dr Sarah Bendall and the student researchers on the project. This information will be entered without any identifying information into a computer database, which will be password-protected and only accessed by Dr Bendall and the student researchers. Your child's data will have a unique code, which will be linked to their contact details, which is kept in a separate password-protected file, for the purpose of contacting them for further information or with your consent, contacting them for future research projects at Orygen. Only Dr Bendall and the student researchers will have access to the link between the unique code and your contact details

We are seeking your consent to keep your child's data stored for future (unspecified) research into youth mental health conducted by Orygen. After all future research is complete your child's information will be kept for 5 years after the results of the final study have been reported. After that it will all be destroyed. We would also like to seek your consent to contact your child in the future and invite him/her to participate in any follow-up studies that may be conducted.

We will endeavour to keep all the information that we collect in the assessments strictly confidential. There are some exceptions to this: 1) information from the assessments may be communicated with your child's case manager to ensure that they receive the best care possible; 2) if we are concerned about your child, we may need to discuss this with their case manager and doctor at Orygen; 3) if as a result of the information your child discloses in the interview relating to their past trauma or abuse we believe that someone else may be at risk. In some cases we may contact The Department of Human Services (DHS) about risk to children under the age of 17 years. Mandatory reporting laws require clinicians to report to Child Protective Services any suspected cases of child abuse and neglect (Children, Youth and Families Act 2005 (Vic.)). In cases where abuse is reported, information gathered by researchers is passed on to the clinical team and the appropriate clinical procedures normally

used within the mental health service are implemented. This may involve reporting abuse to DHS or other support services. In all cases we will discuss this with your child first.

Any information obtained in connection with this research project that can identify your child will remain confidential to the best of our ability and will only be used for the purpose of this research project. It will only be disclosed with your permission, except as required by law. We plan to publish group results in scientific journals, speak about them in scientific conferences and talk about them to other people who work in mental health industries in order to help them improve the service they provide to people with psychosis.

The health records and data obtained from this study may be accessed by the Melbourne Health Office for Research to verify the study procedures and conduct.

Information about the child may be obtained from their health records held at this and other health organisations, for the purpose of this research. By signing the consent form you agree to the research team accessing health records if they are relevant to your child's participation in this research project.

It is anticipated that the results of this research project will be published and/or presented in a variety of forums. In any publication and/or presentation, information will be provided in such a way that the child cannot be identified, except with your express permission.

In accordance with relevant Australian and/or Victorian privacy and other relevant laws, you have the right to request access to the information about the participant that is collected and stored by the research team. You also have the right to request that any information with which you disagree be corrected. Please inform the research team member named at the end of this document if you would like to access the participant's information.

Any information obtained for the purpose of this research project that can identify the participant will be treated as confidential and securely stored. It will be disclosed only with your permission, or as required by law.

We are also seeking your consent to store and use information we gather during this interview with your child in any future research projects that might be conducted. By providing your contact details on the consent form below you are consenting to the possibility of you or your child being contacted in the future and asked if they would like to participate in any follow-up research.

12   Complaints and compensation

If your child suffers any distress or psychological injury as a result of this research project, you should contact the research team as soon as possible. You will be assisted with arranging appropriate treatment and support for the participant.

If you or your child have a complaint about the research team, OR any serious event that occurs following your child's participation in this project, you or your child should talk with their case manager.

13   Who has reviewed the research project?

All research in Australia involving humans is reviewed by an independent group of people called a Human Research Ethics Committee (HREC).
The ethical aspects of this research project have been approved by the HREC of Orygen Youth Health.

This project will be carried out according to the *National Statement on Ethical Conduct in Human Research (2007)*. This statement has been developed to protect the interests of people who agree to participate in human research studies.

14   Further information and who to contact

The person you may need to contact will depend on the nature of your query. If you want any further information concerning this project or if the participant has any problems which may be related to involvement in the project, you can contact any of the following people:

Research Contact Person:

Name	Dr Sarah Bendall
Position	Principal Researcher
Telephone	██████████
Email	████████████████████████

If you have any complaints about any aspect of the project, the way it is being conducted or any questions about being a research participant in general, then you may contact:

Complaints Contact/HREC Executive Officer details:

Name	Ms Jessica Turner
Position	Manager, Melbourne Health Human Research Ethics Committee
Telephone	██████████

Consent Form – Parent/Guardian

Title	Trauma and Psychosis: Exploring the Role of Post-Traumatic Intrusions, Avoidance and Dissociation
HREC Number	HREC# 2014.014
Principal Investigator	Dr Sarah Bendall
Associate Investigator(s)	Pamela Sun and Natalie Peach
Location	Orygen Youth Health Clinical Program

Declaration by Parent/Guardian

I have read the Participant Information Sheet or someone has read it to me in a language that I understand.

I understand the purposes, procedures and risks of the research described in the project.

I have had an opportunity to ask questions and I am satisfied with the answers I have received.

I freely agree to the child participating in this research project as described and understand that I am free to withdraw them at any time during the project without affecting their future care.

I understand that I will be given a signed copy of this document to keep.

I consent to the storage and use of data provided by my child for this research project, as described in the relevant section of the Participant Information Sheet, for (please circle):

- This specific research project   Y / N
- Other research that is closely related to this research project   Y / N
- Any future research   Y / N

☐ I understand that information my child provides for this research may be disclosed to their case manager, and that mandatory reporting laws require that clinicians report any case of suspected child abuse or neglect to Child Protective Services.

Name of Child (please _____

Signature of Child _____ Date _____

Name of Parent/Guardian (please _____

Signature of Parent/Guardian _____ Date _____

I consent to the possibility of my child being contacted in the future and invited to take part in any follow-up research (please circle): Y / N

Participant Contact Details:
Phone number _____ Email address _____

Declaration by Researcher[†]

I have given a verbal explanation of the research project, its procedures and risks and I believe that the parent/guardian has understood that explanation.

Name of Researcher[†](please print) _____

Signature _____ Date _____

[†]An appropriately qualified member of the research team must provide the explanation of, and information concerning, the research project.

Note: All parties signing the consent section must date their own signature.

Form for Withdrawal of Participation – Parent/Guardian

Title   Trauma and Psychosis: Exploring the Role of Post-
                                   Traumatic Intrusions, Avoidance and Dissociation
HREC Number   HREC# 2014.014
Principal Investigator   Dr Sarah Bendall
Associate Investigator(s)   Pamela Sun and Natalie Peach
Location   Orygen Youth Health Clinical Program

Declaration by Parent/Guardian

I wish to withdraw the child from participation in the above research project and understand that such withdrawal will not affect their routine care, or their relationships with the researchers or Orygen Youth Health.

Name of Child (please print) _____

Signature of Child

_____ Date_____

Name of Parent/Guardian (please print) _____

Signature of Parent/Guardian _____ Date_____

In the event that the parent's/guardian's decision to withdraw is communicated verbally, the Senior Researcher must provide a description of the circumstances below.

Declaration by Researcher[†]

I have given a verbal explanation of the implications of withdrawal from the research project and I believe that the parent/guardian has understood that explanation.

Name of Researcher (please print) _____

Signature _____ Date _____

[†]An appropriately qualified member of the research team must provide information concerning withdrawal from the research project.

Note: All parties signing the consent section must date their own signature