

Paranoia in an Attachment Theory Framework

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By

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ABSTRACT

Over the past decade evidence has consistently shown a relationship between adverse experiences in childhood and psychosis in adulthood. Recently, specific associations between attachment-disrupting life experiences and paranoia have been reported, leading to attempts to understand the psychological mechanisms involved in this association, and how these might interact with mechanisms previously found to be important in psychotic experiences. The three empirical studies included in this doctoral thesis used cross-sectional and longitudinal designs to examine whether experiences of paranoia could be understood within an attachment theory framework.

Using an epidemiological dataset the study in Chapter 2 examined the effect of adverse childhood experiences on psychotic symptoms in adulthood. The findings demonstrated that, when co-occurring symptoms were controlled for, experiences of neglect were specifically associated with paranoia, while experiences of sexual abuse (rape, sexual molestation) were specifically associated with hallucinations. Furthermore, the association between neglect and paranoia was fully mediated by insecure attachment, but a similar association was not observed for the association between sexual abuse and hallucinations.

The study in Chapter 3 used both a clinical and a control sample to examine the effect of insecure attachment-related thoughts on psychotic symptoms using a longitudinal design. The main finding revealed that, in the flow of daily life, elevated levels of attachment insecurity predicted subsequent paranoia. This effect was not observed for hallucinations, nor could it be explained through low self-esteem, which in previous studies, has been observed to precede increased levels of paranoia.

The final study in Chapter 4 used a clinical sample to examine whether the association between insecure attachment (avoidant and anxious attachment dimensions) and paranoia was moderated by dissociation. The findings demonstrated that dissociation moderated the association between the anxious attachment dimension (increased negative view of the self) and paranoia. Conditional effects further showed that, at low levels of dissociation, the association between the anxious attachment dimension and paranoia was present, but that, at medium and high levels of dissociation the association did not exist. A similar effect was not observed for the avoidant attachment dimension (increased negative view of others).


Findings from these studies suggest that adverse experiences in childhood, especially experiences of neglect, may be a risk factor for developing paranoia. Furthermore, this association, and experiences of paranoia in the flow of daily life can be understood within an attachment framework. Finally, the findings show that increased levels of dissociation can dampen the association between insecure attachment and paranoia.

Overall these findings suggest that secure attachment may be associated with lower risk for paranoia. This has implications for clinical work, as therapists may focus their psychological interventions on addressing attachment beliefs and work towards establishing a sense of attachment security by strengthening positive beliefs and disconfirming negative beliefs about the self and others. As psychotic symptoms can co-occur, it is also important to assess how psychological mechanisms interact in their effect on specific symptoms. Finally, these findings suggest that policies that promote optimal child-caregiver relationships may enhance population mental health.

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DECLARATION

This thesis is the result of my own work. The material contained in the thesis has not been presented, nor is currently being presented, either wholly or in part for any other degree or qualification.

Signed (candidate)

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Chapter 1

Paranoia in an attachment theory framework¹

¹ Parts from this chapter have been used in a book chapter: Bentall, R. P. & Sitko, K. (in prep.). The specific role of insecure attachment in paranoid delusions. In K. Berry, S. Bucci, A. Danquah (Eds.). ISPS book series.

1.1 Abstract

The first aim of this review is to examine and challenge the traditional concept of schizophrenia, and to make a case for examining psychosis at the symptom level. This is done by assessing the validity, reliability, heterogeneity, comorbidity, and determinants of schizophrenia, and by providing evidence that examining specific symptoms of psychosis, as an alternative approach to diagnostic categories, can be more meaningful in providing clues to the psychological mechanisms involved. The second aim of this review is to introduce childhood and adulthood attachment theories, and discuss measurement and stability of attachment representations. The third aim is to examine the development of psychosis from an attachment theory perspective, and to discuss the theories and research linking insecure attachment with psychosis. The final aim is to review the theories and research which suggest that paranoia, as a specific symptom of psychosis, can be understood within an attachment theory framework.

1.2 Introduction to schizophrenia and symptom specificity

1.2.1 Historical context of schizophrenia

Paranoid symptoms are a common feature of diagnoses in the schizophrenia spectrum, as defined by modern diagnostic manuals such as the Diagnostic and Statistical Manual (DSM) and the International Classification of Diseases. Emil Kraepelin (1856-1926) first described schizophrenia as 'dementia praecox', which he understood to be a progressive neurodegenerative disease that occurred in young adults and resulted in dementia (Ebert & Bär, 2010). Although at the time the leading theories proposed that particular symptoms were characteristic of specific types of illness (Ebert & Bär, 2010), Kraepelin suggested that clusters of symptoms, in relation to the course of the illness, can provide clues to a diagnostic classification (Decker, 2004). Through this system Kraepelin successfully differentiated between 'dementia praecox' and 'manic depression', suggesting that the latter does not lead to a loss of cognitive functions and is associated with better prognosis, essentially making the first distinction between affective disorders and psychoses (Ebert & Bär, 2010). The term 'dementia praecox' was revised to 'schizophrenia' in 1911 by Eugene Bleuler (1857-1939), who conceptualised the disorder as an inherited illness (Ashok, Baugh, & Yeragani, 2012), which could at least be partially understood in terms of psychological mechanisms. Bleuler derived the term from a Greek word *schizein* indicating 'splitting', and *phren* meaning 'soul, spirit, mind' (Fusar-Poli & Politi, 2008).

Kraepelin's concept did not go unchallenged, and was highly debated prior to the First World War. Alfred Hoche (1865-1943), a professor of psychiatry who is a controversial figure with a history of advocating for eugenics and euthanasia of the

‘mentally ill’, claimed that Kraepelin’s nosology was diagnostically and prognostically unsatisfactory, and had indistinct borders (Palm & Möller, 2011). August Homburger, a child psychiatrist, argued that the system lacked causal links between the onset, development, and outcome of illness (Palm & Möller, 2011). These arguments however discontinued during the First World War, and shortly after, Kraepelin’s classification system became accepted (Palm & Möller, 2011). Since that time the system has substantially contributed to current classification systems such as the American Psychiatric Association (APA) DSM which still rely on Kraepelin’s concept (Ebert & Bär, 2010).

1.2.2 Development of schizophrenia within the DSM

By the end of the Second World War the APA formed a group to develop a diagnostic system, and the first DSM of Mental Disorders was published in 1952. The diagnostic categories for both the DSM-I (APA, 1952) and the DSM-II (APA, 1968) were based on consensus agreement. Since the diagnostic definitions were vague, reliability was poor and the diagnostic system was viewed as inadequate (Beck, Ward, Mendelson, Mock, & Erbaugh, 1962). With the introduction of the DSM-III (APA, 1980) the diagnostic classification appeared to have clearer boundaries for a schizophrenia diagnosis (Morey & Blashfield, 1981). In order to now make a diagnosis, certain signs and symptoms had to be present. The basic assumption of the DSM-III was that since the symptoms were clearly defined, the diagnostic system would be reliable, a claim that was made by its authors (e.g. Spitzer, 2001). In an attempt to improve the manual further, a revised version, the DSM-III-R (APA, 1987), was created which narrowed the definition of schizophrenia, essentially making the criteria for a schizophrenia diagnosis more strict. Such narrowing excluded around 10% of those who under the DSM-III would

have received a schizophrenia diagnosis (Fenton, McGlashan, & Heinsen, 1988). Although narrowing the criteria may be associated with increased homogeneity and a subsequent improvement in validity, research suggests that this was not the case (Fenton et al., 1988). Since that time the DSM has undergone several updates DSM-IV (APA, 1994), DSM-IV-TR (APA, 2000), with modest changes to aspects of the criteria needed for a schizophrenia diagnosis, such as removing the requirement that the onset should occur before age 45, and by including negative symptoms (Tandon et al., 2013).

The most recent edition, the DSM-5 (APA, 2013a), has retained its core criteria for a schizophrenia diagnosis from the DSM-IV. One of the main differences between these two editions is the removal of the schizophrenia subtypes, (i.e. paranoid, disorganized, catatonic) due to limited stability, low reliability, and poor validity (APA, 2013b). To receive a schizophrenia diagnosis on the basis of the DSM-5, one must have two of five symptoms: delusions, hallucinations, disorganised speech, negative symptoms, and/or disorganised behaviours; one of which must be delusions, hallucinations, or disorganised speech. Although this definition may be viewed as a slight improvement to the criteria in DSM-IV, there are 12 different ways two individuals can meet the criteria for a diagnosis without having any symptoms in common, suggesting high heterogeneity within diagnoses (Read, 2013a).

Critics have argued that frequent changes to the diagnostic criteria without clear evidence of improved validity may actually hinder progress in research (Fenton et al., 1988), and may be counterproductive to clinical work (Zimmerman, 1988). Bentall (2009) has suggested that “whereas we may not be able to agree about who has ‘schizophrenia’...we can agree about who experiences auditory hallucinations,

who experiences paranoid delusions” (p.166), making a reasonable argument for examining psychosis at the symptom level. Bentall (2004, 2009) further proposed that studying psychosis in this way may be more meaningful in understanding the psychological mechanisms involved.

1.2.3 Reliability and validity of schizophrenia

Spitzer and Fleiss (1974) suggested two important criteria pertaining to diagnoses, first that they must be reliable and second they must be valid. They defined the terms as “reliability refers to the consistency with which subjects are classified; validity, to the utility of the system for its various purposes...” such as “clinical features, aetiology, course of illness and treatment” (p. 341). It is important to make the distinction that although diagnoses can be reliable without being valid, they cannot be valid without being reliable. Spitzer and Fleiss (1974) developed guidelines which suggested that if the kappa coefficient of the clinical agreement between two or more raters was above .70, reliability was considered satisfactory. Hyler, Williams, and Spitzer (1982) argued that the interrater reliability of DSM-III was extremely good, however Kirk and Kutchins (1997) found that when reviewing DSM-III field trials, kappa coefficients failed to exceed the .70 cut-off.

Cicchetti and Sparrow (1981) proposed that when the kappa statistic is below .40 the level of clinical agreement is poor, when it is between .40 and .59 the level of clinical agreement is fair, when it is between .60 and .74 the level of clinical agreement is good, and when it is above .75 the level of clinical agreement is excellent. In the DSM-5, field trials revealed a kappa coefficient of .46 for schizophrenia (Regier et al., 2013). According to Cicchetti and Sparrow’s (1981) criteria, clinical agreement would be considered fair. Narrow and colleagues (2013)

however propose that in the DSM-5 the kappa coefficients should be interpreted as follows: .20 and below as unacceptable, .20 to .39 as questionable, .40 to .59 as good, .60 to .79 as very good and .80 and above as excellent. According to these criteria then, the reliability for schizophrenia is considered good (Regier et al., 2013).

According to Spitzer and Fleiss (1974) diagnoses cannot be valid without first being reliable. Since schizophrenia cannot be diagnosed in a reliable manner, it could be argued that there is no value in investigating construct validity (Read, 2013a). It has however been suggested that in such cases, predictive validity is most often used to compare and evaluate diagnostic criteria (Fenton, Mosher, & Matthews, 1981).

Although Kraepelin conceptualised schizophrenia to be a progressive neurodegenerative disease and therefore believed that the course of the illness can provide clues to the diagnosis, research has shown that the predictive validity of schizophrenia is poor. In one study, Ciompi (1980) found that approximately 25% of individuals with a schizophrenia diagnosis fully recovered, 25% had severe chronic symptoms and never recovered, while about 50% had mild to moderate chronic symptoms with favourable outcomes. Similar findings have since been observed in more recent research by Harrison et al. (2001), suggesting that, contrary to what Kraepelin believed, individuals who share a schizophrenia diagnosis may not share a common outcome. A study examined outcome (recovery) in terms of both clinical and social domains, with the criteria being, that recovery, in at least one of the domains had to be persistent over a two year period (Jääskeläinen et al., 2012). This meta-analysis found that 1 in 7 individuals (13.5%) met this criteria. These studies however have focused on clinical (e.g. current functioning, symptoms, and the course of the illness) and/or social (e.g. occupational capacity, functioning) domains as a measure of outcome, and it could be argued that such definitions of recovery may not

be shared by the diagnosed individual. Several studies have subsequently aimed to compare the clients' subjective recovery versus clinician-rated symptoms, and found that these ratings correlated poorly (Morrison et al., 2013). Since recovery is a personal journey defined by the individual (Anthony, 1993) there may be even more variability in recovery depending on how the outcome is defined.

1.2.4 Comorbidity of diagnoses

The aim of diagnostic categories is to classify people into unique and distinct diagnostic categories on the basis of presenting clusters of symptoms. Symptoms of schizophrenia have however been shown to be present with other diagnoses. Delusional and hallucinatory symptoms have for example been reported by individuals with a diagnosis of major depression (Serretti, Lattuada, Catalano, & Smeraldi, 1999) and bipolar disorder (Goodwin & Jamison, 1990). It is also common for individuals with a schizophrenia diagnosis to receive additional diagnoses, with prevalence rates of 15% for panic disorder, 23% for obsessive-compulsive disorder, 29% for post-traumatic stress disorder, 50% for depression, and 47% for substance abuse (Buckley, Miller, Lehrer, & Castle, 2009). In the Epidemiological Catchment Area Study, which used DSM-III criteria to typify a large US population sample, it was shown that individuals with a diagnosis of schizophrenia had an odds ratio of 46 in meeting the diagnostic criteria for mania, and an odds ratio of 14 in meeting the diagnostic criteria for depression (Robbins, Locke, & Regier, 1991). The authors inconceivably concluded that the reason for this co-occurrence must be because one disorder increases the risk for developing another disorder, but a more plausible explanation is that the DSM-III criteria did not identify discrete diagnostic conditions. Research has since shown that psychotic disorders may be best

understood in terms of clusters of symptoms, or symptom-dimensions that cross traditional diagnostic boundaries.

1.2.5 Heterogeneity within schizophrenia

In an attempt to explore patterns of comorbidity between 11 diagnostic categories (schizophrenia syndrome, schizotypal personality, obsessive-compulsive symptoms, alcohol use disorder, major depressive episode, cannabis use disorder, other drug use disorder, social anxiety, panic attack, antisocial personality, and conduct disorder), Kotov et al. (2010) found that the best model divided disorders into three main spectra: the internalising spectrum (mood problems), the externalising spectrum (behaviour problems), and schizophrenia.

Other researchers have attempted to study sub-dimensions of psychosis by factor analysing symptom data. In his research, Liddle (1987) found that there are three clusters of schizophrenia symptoms: positive symptoms, negative symptoms and cognitive disorganisation, which do not correlate with each other. van Os and Kapur (2009) however argued that schizophrenia, schizoaffective disorder, and bipolar could be explained on a profile of five dimensions: psychosis symptoms (e.g. hallucinations, delusions); negative symptoms (e.g. social and emotional withdrawal, blunted affect); cognitive impairment (e.g. difficulties in executive functioning); mania (e.g. elated mood); and depression.

It has since been proposed that exploring these dimensions could be more meaningful in comparison with traditional Kraepelinian approaches. Dimensions provide the opportunity to observe how certain symptoms interact, and the effect that such interactions may have on increasing the risk of other symptoms (Borsboom & Cramer, 2013). As mentioned previously, others have since proposed that it could be

meaningful to study schizophrenia at the symptom level (Bentall, 2004), suggesting that there may be specific psychological mechanisms associated with specific symptoms (e.g. Bentall, Wickham, Shevlin, & Varese, 2012; Bentall et al., 2014). This view has been supported by others who argue that studying definable constructs, like delusions and hallucinations, which can be reliably measured, could be more helpful (Read, 2013a). It has been proposed however that controlling for co-occurring symptoms may be important when examining specific symptoms, as comorbid symptoms may confound predictors (Pickering, Simpson, & Bentall, 2008).

1.2.6 A continuum of psychotic experiences

Although the DSM adopts a categorical approach to schizophrenia diagnoses, early research has suggested that these symptoms may exist on a continuum. Claridge (1990) argued that psychotic experiences exist on a continuum with normal functioning, and Chapman and Chapman (1980), and Claridge and Hewitt (1987) observed that schizotypal traits exist in non-clinical populations. An epidemiological study found that 12.6% of the general population reported paranoid beliefs (Poulton et al., 2000), and Freeman, Pugh, Vorontsova, Antley, and Slater (2010) similarly found evidence that paranoid beliefs exist on a continuum with normal functioning. In their systematic-review and meta-analysis van Os, Linscott, Myin-Germeys, Delespaul, and Krabbendam (2009) found more conclusive evidence that psychotic experiences lie on a continuum and could be measured in non-clinical populations. More recent research using taxometric methods have also supported a continuum model (Arntz et al., 2009). These findings challenge the traditional view of schizophrenia diagnoses, and imply that experiencing psychotic symptoms is not necessarily a function of having a distinct diagnosable disorder.

1.2.7 Bio-genetic determinants of psychosis

Traditionally, it has been thought that schizophrenia was a disease of the brain, and research has mainly focused on examining brain structures, heredity, and the idea of a chemical imbalance as accounts of the cause of schizophrenia. One of the pitfalls already mentioned in a previous section is that if diagnoses are not reliable and are heterogeneous, how do researchers know that the individuals they are studying are even comparable (Read, 2013b)?

Research has found several structural abnormalities in individuals with a schizophrenia diagnosis such as ventricular enlargement (Reveley, 1985), reduced hippocampal volume (Nelson, Saykin, Flashman, & Riordan, 1998), reduced collosal thickness (Downhill et al., 2000), reduced volume of anterior cingulate (Job et al., 2002), and reduced brain size (Ward, Friedman, Wise, & Schulz, 1996). It could be proposed that this evidence builds the case that schizophrenia is a disease of the brain by showing that the brains of those with a diagnosis are structurally different.

Several studies have however found similar structural abnormalities in individuals with other diagnoses and in the general population. A study by Copolov and Crook (2000) for example found overlap in ventricle enlargement between those with a schizophrenia diagnosis and the general population. Reduced hippocampal volume (Nemeroff et al., 2006), reduced collosal thickness (Teicher, Tomoda, & Andersen, 2006), and reduced volume of anterior cingulate (Kitayama, Quinn, & Bremner, 2006) have similarly been observed in individuals with post-traumatic stress disorder (PTSD).

Although some researchers have argued that these structural abnormalities precede illness (Vita, De Peri, Silenzi, & Dieci, 2006), others have argued that at

least some of these changes result from taking prescribed anti-psychotic medication. Ho, Andreasen, Ziebell, Pierson, and Magnotta (2011) demonstrated that a general reduction in overall brain tissue was associated with greater lifetime dose of treatment with antipsychotic medication, which could account for the observed enlarged ventricles. Others still have suggested a 'Traumagenic Neurodevelopmental Model', which proposes that these structural abnormalities are a result of the brain responding to environmental stressors (Read, Perry, Moskowitz, & Connolly, 2001). Hence, although structural brain abnormalities are observed in individuals with a schizophrenia diagnosis, this should not necessarily be viewed as the ultimate cause of schizophrenia.

There is a view that individuals with schizophrenia have a 'chemical imbalance' in the brain that is associated with dopaminergic hyperactivity (van Os & Kapur, 2009). This imbalance is allegedly related to experiencing psychotic symptoms, and antipsychotic medication functions to restore that balance by blocking dopamine receptors. However, a recent meta-analysis has reported that current drug treatments fail to target these dopaminergic abnormalities (Howes et al., 2012). Although this conceptual framework may suggest that a chemical imbalance may be viewed as one of the causes of schizophrenia, it has been suggested that the role of dopamine in schizophrenia is more complex. Howes and Kapur (2009) for example, suggest that a variety of risk factors, including stress, trauma, obstetric and pregnancy complications, genes, and drug use, link to dopaminergic hyperactivity. Howes and Murray (2014) similarly suggest that dysregulation of the dopamine system is partly a result of childhood trauma, demonstrating that biological differences do not necessarily imply a purely biological aetiology.

Within the diathesis stress framework it is suggested that schizophrenia is genetically inherited, and that environmental stressors ‘awaken’ the schizophrenia gene (Joseph, 2013). Evidence to support that schizophrenia is genetically inherited comes from family (Gottesman, McGuffin, & Farmer, 1987), adoptive (Tienari et al., 1985) and twin (Cardno & Gottesman, 2000) studies. Cardno and Gottesman (2000), for example suggested 80-85% heritability, while Sullivan, Kendler, and Neale (2003) showed 81% heritability. Joseph (2004) suggested there were methodological flaws in the family, adoptive, and twin studies proposing that these studies do not provide convincing evidence of a causal role of genes in schizophrenia. In his re-analysis of the data using strict methodological criteria Joseph (2004) found considerably lower pairwise concordance rates of 4.5% for dizygotic twins and 22.4% for monozygotic twins.

Although heritability estimates have been found to be both low (Joseph, 2004) and high (Cardno & Gottesman, 2000; Sullivan, Kendler, & Neale, 2003), there is generally a misconception as to what heritability statistics mean. Heritability can be defined as “the percentage of variation in a trait or illness...that can be attributed to genes” (Bentall, 2009; p.126). Bentall (2009) points out that heritability statistics are partial correlation coefficients from which causation cannot be inferred. He further shows that estimates from heritability calculations do not only depend on genes, but also on the degree of variation in the environment and also gene x environment interactions, which may mask substantial environmental effects. Hence, there may be substantial environmental effects even if heritability approaches 100%. More research examining epigenetics suggests that gene expression can be modulated by the environment, so that the environment plays a significant role in

turning genes ‘on’ or ‘off’, implying that genetic and environmental effects cannot be neatly separated (Read, Bentall, & Fosse, 2009; Rutten & Mill, 2009).

1.2.8 Trauma as a psychosocial determinant of psychosis

Although the earliest conceptualisations of psychosis were dominated by a bio-genetic model, with Karl Jaspers (1883-1960) arguing that psychotic symptoms cannot be understood in terms of a person’s experience (Stanghellini & Fuchs, 2013), this view did not go unchallenged. Laing (1967) in one of his influential writings proposed that ‘insanity’ is a rational response to an ‘insane’ world. Laing was a sceptic of the traditional Kraepelinian approach and argued that psychosis was meaningful. In one of his later works Laing claimed that family victimisation played a causal role in psychosis (Laing & Esterson, 1970). Maher (1974) similarly proposed that psychosis can be understood in terms of a person’s experience, and argued that odd experiences lead people to have odd ideas. This view was also shared by others who suggested that traumatic experiences in childhood, especially those involving attachment figures, facilitate the development and maintenance of psychotic symptoms through the belief that others are threatening, and the self is vulnerable (Penn, Corrigan, Bentall, Racenstein, & Newman, 1997).

Over the past decade an abundance of research has been published demonstrating that experiences of childhood trauma and victimisation are associated with psychosis. Early experiences of sexual abuse (Bebbington et al., 2004; Bebbington et al., 2011; Read, Agar, Argyle, & Aderhold, 2003; Read, van Os, Morrison, & Ross, 2005; Shevlin, Dorahy, & Adamson, 2007b), physical abuse (Read et al., 2003; Kelleher et al., 2008; Shevlin, Dorahy, & Adamson, 2007a), bullying (Campbell & Morrison, 2007; Kelleher et al., 2008), and of being exposed

to domestic violence (Kelleher et al., 2008), are a few of the experiences that have been associated with psychosis. A recent meta-analysis of retrospective, prospective, and case-control studies supported these findings by demonstrating that childhood traumatic experiences are a strong risk factor to developing psychosis, with an overall odds ratio of 2.78 (Varese et al., 2012). A dose-response relationship between severity of trauma and risk has also been shown (Shevlin et al., 2007a; Shevlin et al., 2007b; Varese et al., 2012).

Some of these traumatic childhood experiences may disrupt the development of optimal attachment relationships, and may also lead some to re-evaluate their attachment relationships. In a prospective cohort study for example, the risk for psychosis was increased for individuals who were raised by mothers who during pregnancy reported them as unwanted (Myhrman, Rantakallio, Isohanni, Jones, & Partanen, 1996). In two case control studies the loss of a parent through separation or death at an early age was associated with an increased risk for psychosis (Agid et al., 1999; Morgan et al., 2007). In a retrospective study, when compared with the general population, individuals with schizophrenia diagnoses were significantly more likely to have a history of being placed in children's homes (Cannon et al., 2001). In another study, 35% those who had a history of being removed from their family home due to neglect later had experiences of psychosis (Robins, 1966).

It has been argued that people with psychosis may be biased in recalling their early traumatic experiences (Susser & Widom, 2012). One study found that 74% of individuals with psychosis validated their past histories using corroborating evidence from medical notes, the recall of siblings and family members, even recall from the perpetrator (Herman & Schatzow, 1987). Another study found that individuals with psychosis were reliable in reporting their early traumatic experiences when assessed

seven years after initial baseline measures (Fisher et al., 2011). A meta-analysis which included, prospective, case-control, and epidemiological studies found similar odds ratios of exposure to early traumatic experiences for both retrospective and prospective studies (Varese et al., 2012), providing reassurance that retrospective data from individuals with psychosis is credible.

The association between early life traumatic experiences and adulthood psychopathology is not direct, and a significant number of individuals who experience trauma do not develop psychopathology (Gumley & Schwannauer, 2006). There are a variety of factors that could influence the development of psychopathology, for example how such experiences are interpreted and processed (Gumley & Schwannauer, 2006). In light of the evidence linking childhood trauma to psychosis, it becomes extremely important to develop a better understanding of psychological mechanisms to inform therapeutic interventions. This becomes especially important as research shows that service users who report a history of childhood traumatic experiences do not respond well to pharmacological treatments (Nemeroff et al., 2005).

1.2.9 Other psychosocial determinants of psychosis

In addition to traumatic experiences, a number of other psychosocial determinants of psychosis have been identified. A meta-analysis and review by Cantor-Graae and Selten (2005) has shown that being an ethnic minority/migrant is associated with increased risk of psychosis. They found a relative risk of 2.7 for first-generation migrants, and an even higher relative risk of 4.5 for second-generation migrants for developing schizophrenia. In addition, a higher relative risk of 4.8 was found for black migrants compared to white or migrants of other skin colours.

Another meta-analysis examined urbanicity (the impact of living in urban areas), and found that the risk for schizophrenia was estimated at 2.37 times higher for those living in urban compared to rural environments (Vassos, Pedersen, Murray, Collier, & Lewis, 2012). In a separate study a dose-response relationship was also found between the amount of time spent living in an urban environment and schizophrenia (Pedersen & Mortensen, 2001).

A recent systematic-review has shown higher incident rates of schizophrenia in countries with higher levels of income inequality (Burns, Tomita, & Kapadia, 2014). Another study has shown that income inequality and poverty, at the neighbourhood level, were associated with increased risk of nonaffective psychosis; a relative risk of 1.25 was shown for income inequality, and a relative risk of 1.28 was shown for poverty (Kirkbride, Jones, Ullrich, & Coid, 2012).

Finally, a meta-analysis examined parental communication deviance (abnormal speech style) and thought disorder in offspring. This study showed that within the context of family relationships, communication deviance of caregivers was associated with increased risk of psychosis in offspring (de Sousa, Varese, Sellwood, & Bentall, 2013).

1.2.10 Specificity Research

Bentall (2004) has proposed that examining specific symptoms of schizophrenia could be more meaningful than examining schizophrenia as a diagnosis. Mojtabai and Reider (1998) have however argued that studying diagnoses is preferred to studying symptoms. First, they proposed that diagnoses are more reliable than symptoms, however as noted in a previous section, current evidence suggests that schizophrenia diagnoses are not reliable. Second, they proposed that

symptoms do not reveal anything about the cause of the ‘illness’. However, a recent study which examined a large epidemiological dataset observed specific associations between childhood traumatic experiences and psychotic symptoms (Bentall et al., 2012). The findings revealed that experiences of childhood sexual abuse (rape) were specifically associated with hallucinations, while experiences of being brought up in institutional care were specifically associated with paranoia. Research suggests that 22%-62% of adult in-patients have reported childhood neglect (Read, Goodman, Morrison, Ross, & Aderhold, 2004). In light of this evidence, it becomes extremely important to examine the psychological mechanisms that are involved in paranoid beliefs.

A recent review by Bentall et al. (2014) considered a number of symptom-specific mechanisms that link the associations found in Bentall et al.’s (2012) specificity study described above. The association between sexual abuse and hallucinations was considered in terms of two mechanisms: impaired source monitoring (failure to discriminate between internal and external generated perceptions) and dissociation. The review suggested that traumatic experiences in childhood may lead individuals to experience spontaneous trauma-related intrusive thoughts. This experience is believed to increase proneness to source misattribution, leading to auditory-verbal hallucinations (AVH). It has been further suggested that dissociation, which is a psychological reaction to traumatic experiences, may also link sexual abuse and AVH. In previous studies dissociation has been shown to mediate the association between sexual abuse and AVH (Varese, Barkus, & Bentall, 2012). In the face of painful experiences dissociation is believed to function as a coping strategy, so that the emotions and memories associated with the trauma are disconnected from the executive-self (van der Hart, Nijenhuis, & Steele, 2006) and

may remain unintegrated into conscious memory (Bernstein & Putnam, 1986). It has been suggested that source monitoring bias and dissociation may both contribute to experiencing AVH. The association between being brought up in institutional care and paranoia has been considered within an attachment theory framework (described in section on attachment). It has been proposed that the ability to trust others develops from early relationships with primary caregivers. If early relationships with caregivers are disrupted, this may subsequently impact on how individuals view later relationships, and may have a potent effect on developing paranoid beliefs.

1.2.11 Theories of paranoid delusions

The DSM-5 (APA, 2013a) defines delusions as:

“Fixed beliefs that are not amenable to change in light of conflicting evidence. Their content may include a variety of themes (e.g., persecutory, referential, somatic, religious, grandiose). Persecutory delusions (i.e., belief that one is going to be harmed, harassed and so forth by an individual, organization, or other group) are most common. [...] Delusions are deemed bizarre if they are clearly implausible and not understandable to same-culture peers and do not derive from ordinary life experiences. [...] The distinction between a delusion and a strongly held idea is sometimes difficult to make and depends in part on the degree of conviction with which the belief is held despite clear or reasonable contradictory evidence regarding its veracity.”

In contrast with this and similar definitions in previous DSM editions, some authors, for example Maher (1974) have argued that reasoning in individuals with persecutory (paranoid) delusions is rational, and that such delusions result from an attempt at explaining anomalous experiences.

Over the years several theories have attempted to gain an understanding of paranoid experiences, as they are the most commonly reported delusion (Moutoussis, Williams, Dayan, & Bentall, 2007). As mentioned in the section on continuum models of psychosis, psychotic experiences appear to exist on a continuum with normal functioning, and this seems to be true for paranoid beliefs, which extend from ordinary suspiciousness and feelings of mistrust to extreme beliefs about the ill intentions of others (Freeman et al., 2005). It has been suggested that paranoia is an adaptive process acting as a strategy to circumvent threatening events (Morrison et al., 2011). Collip et al. (2011) differentiated between clinical and sub-clinical paranoia, showing that sub-clinical paranoia is affected by social context, and is exacerbated around unfamiliar people and during stress, while clinical paranoia fluctuates independently of these factors.

Four psychological processes (models) have been proposed in understanding paranoid delusions. The ‘theory of mind’ (ToM) model (Frith & Corcoran, 1996) proposes that individuals with paranoid delusions have difficulty understanding thoughts and feelings of others, leading them to misinterpret their intentions as malign. The ‘jumping to conclusions’ (JTC) approach (Garety, Kuipers, Fowler, Freeman, & Bebbington, 2001) proposes that individuals with paranoid delusions have a tendency to make decisions about uncertain events with limited information. The attributional model (Bentall, Corcoran, Howard, Blackwood, & Kinderman, 2001; Bentall & Kaney, 1996) suggests that paranoia serves as a self-protective function; the theory proposes that paranoia occurs after an individual attributes negative events to external causes, such as other people or circumstances, in order to defend against their negative beliefs about the self. In a model by Freeman, Garety, Kuipers, Fowler, and Bebbington (2002), paranoid delusions are proposed to be

beliefs about threat. Similarly to Maher (1974), Freeman et al. (2002) propose that these beliefs arise from anomalous experiences which result in the person searching for meaning. Freeman et al. (2002) further suggest that this occurs in combination with cognitive biases, which reflect pre-existing beliefs about the self, others, and world. A recent study investigated all of these psychological processes in a complex path analysis to explore which best explained paranoid beliefs. The evidence showed that all processes were important, with the exception of the externalising attributional style, which could not be measured reliably in the study (paranoia was nonetheless associated with excessively global and stable attributions for negative events). It was concluded that these process can be grouped into an emotional domain (low self-esteem, negative mood and pessimistic attributions) and a domain of cognitive impairments (JTC bias, impaired ToM and impaired executive functioning) (Bentall et al., 2009). Importantly these influences were independent of each other.

1.3 Introduction to attachment theory

1.3.1 Historical context of attachment theory

John Bowlby, the father of attachment theory embarked on a career as a child psychiatrist after having volunteered at a school for maladjusted children where he observed two children in particular, one who was isolated and affectionless, and the other who was considered not to have a stable attachment figure (Bretherton, 1992). Through his early writings about affectionless children, and through closely observing the mental health of institutionalised, hospitalised, and homeless children in post war Europe, Bowlby went on to revolutionise our understanding of attachment, and developing the field of psychological research now known as attachment theory. Bowlby concluded that, in order to thrive emotionally children

need warm, close, intimate, and continuous caregiving environments, and that when deprived of these essentials, mental health difficulties may develop (Bowlby, 1951).

Mary Ainsworth who is also considered a prominent figure in the early attachment literature developed Bowlby's ideas by suggesting the concept of a 'secure base'. Ainsworth proposed that children gradually begin to explore novel environments when they feel a secure dependence on their caregivers. Bowlby subsequently developed a theoretical model to explain these kinds of observations, which Ainsworth began to test using the Strange Situation, which allowed her to observe how infants and their caregivers interact using separation episodes (Ainsworth & Bell, 1970).

1.3.2 Attachment theory in childhood

Attachment theory postulates that infants and young children form emotional bonds with their primary caregivers through proximity seeking and maintaining behaviours (Bowlby, 1973). Bowlby conceptualised proximity seeking as an in-born affect regulation process designed to relieve distress and establish feelings of safety and security. Over time the child's perception of the parental response to their bids for proximity allows them to develop internal working models about the self and others (Bowlby, 1973). Children whose bid for proximity is met with consistent, responsive, accessible, sensitive, and emotionally available care develop a positive working model about others. These parental responses also foster the development of a positive model of the self, as on the one hand they show that the world is a safe place (Bowlby, 1988), and that others are dependable and trustworthy, and also demonstrate that the child is worthy enough to receive such care. These optimal early-life caregiving environments are considered to facilitate the development of a

secure attachment style and optimal functioning in later life (Main & Solomon, 1990).

Insecure attachment styles are considered to develop in suboptimal early-life caregiving environments, where attempts for proximity seeking have often failed and primary caregivers are considered to be unavailable, unpredictable, inconsistent, and unresponsive (Main & Solomon, 1990). As a result the child may develop hyperactivating/deactivating attachment strategies (Main, 1990). An anxious attachment style, characterised by a negative model of the self and a positive model of others, develops when the primary caregiver is viewed as inconsistent, sometimes presenting as sensitive and responsive yet other times as insensitive and unresponsive. This parental response leads to the development of feelings of unworthiness and worry about future rejection, along with a strong desire for closeness by hyperactivating strategies to achieve proximity. An avoidant attachment style, characterised by a positive model of the self and a negative model of others, develops when a primary caregiver is viewed as unresponsive and unavailable. These children develop to be self-reliant, and prefer to remain distant from others while deactivating their attachment needs. A disorganised attachment style similarly develops in sub-optimal caregiving environments where the parent is viewed as confusing and contradictory, often through frightening and frightened behaviours, and is often the source of the child's distress (Main & Solomon, 1990). These parental responses create confusion for the child about the self and others, and facilitate the development of negative models about both (Main & Solomon, 1990).

There is some genetic evidence which suggests that a polymorphism of the DRD2 dopamine receptor gene is associated with anxious attachment, while a polymorphism of the 5HT2A serotonin receptor gene is associated with avoidant

attachment (Gillath, Shaver, Baek, & Chun, 2008). Another study proposed that a polymorphism of the DRD7 7-repeat was associated with risk for developing disorganised attachment. This study examined gene x environment interactions and found that those who had the polymorphism and who were raised in sub-optimal environments developed disorganised attachment, while those at genetic risk who were raised in optimal environments had positive developmental outcomes (Bakermans-Kranenburg & van Ijzendoorn, 2007).

1.3.3 Attachment theory in adulthood

Attachment theory continues to have a significant influence on the way human relationships are understood across the lifespan. Adult attachment theory postulates that internal working models in early-life provide a framework containing basic assumptions about the self and others which help anticipate and interpret behaviour and guide future attachment related interactions (Bartholomew & Horowitz, 1991). Bartholomew and Horowitz (1991) conceptualise adult attachment similarly to the childhood attachment styles of secure, preoccupied (anxious), dismissive (avoidant), and fearful (disorganised). In adulthood, an individual with a fearful style exhibits a strong desire to get close to other people, but avoids getting involved with others because of fear of rejection. A preoccupied style reflects individuals who become overinvolved in relationships, and have a tendency to idolise others, like to rely on others, and strive to be accepted by others. A dismissing style reflects individuals who avoid close relationships and downplay their importance; they tend to remain independent and self-reliant. A secure attachment style, however, reflects individuals who easily become emotionally close with others and do not worry about others not accepting them. Similarly to Main (1990), Cassidy and Kobak (1988) describe hyperactivating/deactivating secondary attachment

strategies that are utilised in adulthood interactions in an attempt to manage attachment related threats.

1.3.4 Stability of attachment

Bowlby conceptualised attachment as a result of past attachment experiences and contextual factors (Bowlby, 1973). Despite support for the stability of attachment (Howes & Hamilton, 1992; Kirkpatrick & Hazan, 1994), there is evidence that attachment styles can be unstable over the long-term (Cozzarelli, Karafa, Collins, & Tagler, 2003; Weinfield, Whaley, & Egeland, 2004). The loss of a parent, physical or sexual abuse, parental psychiatric difficulties, parental divorce, and life threatening illness have all shown to be factors that impact on attachment (Cozzarelli et al., 2003; Weinfield et al., 2004), and demonstrate that attachment models are adaptable to significant life events. Studies by Aikins, Howes, and Hamilton (2009) and Sroufe (2005) have reported that there is more stability between infancy and adulthood than between infancy and adolescence, although a study by Weinfield, Sroufe, and Egeland (2000) showed more instability between infancy and adolescence. The most recent meta-analysis exploring attachment stability across the life-span, however, found moderate overall levels of stability (Pinquart, Feußner, & Ahnert, 2013). Stability was observed when intervals were less than 5 years, a reduction in stability was observed for intervals between 5 -14 years, and a lack of stability was observed for intervals larger than 15 years. Furthermore it was suggested that individuals with secure attachments showed more stability compared to those with insecure attachments.

Although research suggests that attachment style can change across the life-span, other research suggests that attachment representations can fluctuate over

shorter periods of time. Scharfe and Bartholomew (1994) showed that 40% changed in their attachment stability over an eight month period, and proposed that these changes were not consistently related to significant life events. Baldwin and Fehr (1995) showed that 30% changed their attachment style ranging from a week to several months. Although it could be argued that such fluctuations may result from unreliable assessment tools, Baldwin and Fehr (1995) have made the case that attachment fluctuations reflect meaningful variability that is impacted by contextual cues.

1.3.5 Assessment of attachment

Attachment can be measured using self-report and interview methods. The most commonly used measure of self-reported adulthood attachment is the Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991), which is grounded in a cognitive approach. This scale uses four short paragraphs to describe secure, preoccupied, dismissing, and fearful attachment styles. First, individuals have to select the one style that best describes them, and then rate each style on a 7-point Likert scale. Characteristics from these styles can be used to capture two dimension, the anxious attachment dimension, where higher scores are associated with an increased negative view of the self, and the avoidant attachment dimension, where higher scores are associated with an increased negative view of others. It has been suggested that high scores on both dimensions reflect fearful attachment, while low scores on both dimensions reflect secure attachment, and high scores on the anxious dimension only reflect preoccupied attachment, while high scores on the avoidant dimension only reflect dismissing attachment (Ravitz, Maunder, Hunter, Sthankiya, & Lancee, 2010). The RQ has adequate reliability, and very good discriminant and face validity (Ravitz et al., 2010).

In comparison to the cognitive approach, the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985) is grounded in a process-oriented approach. The AAI examines states of mind of adult attachment representations through narratives of childhood experiences to classify individuals into three categories: secure/autonomous, avoidant/dismissing, anxious/preoccupied, and the unclassifiable or the unresolved category (de Haas, Bakermans-Kranenburg, & van IJzendoorn, 1994).

Various factors are taken into account when coding the interviews, such as capacity for reflection and the coherence of the narrative. The AAI is regarded as an established measure of attachment representations, however its utility is limited by the amount of time it takes to train to administer the measure, to code, and to transcribe the interviews (Ravitz et al., 2010).

Although the RQ and the AAI are both grounded in Bowlby's theory of attachment, it has been suggested that they may tap into different aspects of adult attachment representations (Jacobvitz, Curran, & Moller, 2002). Although Shaver, Belsky, and Brennan (2000) found modest associations between the RQ and the AAI, Crowell, Treboux, and Waters (1999) and Holtzworth-Munroe, Stuart, and Hutchinson (1997) found no association between the two types of assessment. This suggests that these differing approaches used to measure adult attachment may be capturing different constructs.

In addition to the RQ and the AAI, there are several other attachment measures: for a full review see Ravitz et al. (2010). There is one attachment measure that has been designed specifically for psychotic populations, the Psychosis Attachment Measure (PAM; Berry, Wearden, Barrowclough, & Liversidge 2006).

The PAM has been developed on the basis of the RQ and the Experiences in Close Relationships measure (Brennan, Clark, & Shaver, 1998). It is a 16 item self-report measure that is rated on a 4-point Likert scale and the scores are used to calculate two attachment dimensions (attachment avoidance and anxiety). The PAM shows concurrent validity with the RQ (Berry et al., 2006), which is used in this thesis because of its ease of completion.

It has been suggested that attachment strategies may limit an individual's awareness of their insecurity, and explicit measures of attachment may therefore not represent valid attachment representations (Read & Gumley, 2008). Research however suggests convergent validity between explicit and implicit measures of attachment representations when comparing self-reported with implicit priming techniques (Bartholomew & Shaver, 1998; Brennan et al., 1998; Shaver & Mikulincer, 2004).

1.3.6 Insecure attachment and psychopathology

Research has shown that insecure attachment is associated with a range of different psychopathologies such as attention deficit hyperactivity disorder (Clarke, Ungerer, Chahoud, Johnson, & Stiefel, 2002), obsessive-compulsive disorder (Myhr, Sookman, & Pinard, 2004), post-traumatic stress disorder (Muller, Sicoli, & Lemieux, 2000), eating disorders (Ward et al., 2001), depression (Cantazaro & Wei, 2010), anxiety (Bosmans, Braet, & Van Vlierberghe, 2010), and bipolar 1 disorder (Morriss, van der Gucht, Lancaster, & Bentall, 2009). This evidence suggests that insecure attachment may be a nonspecific contributor to various psychopathologies, and that what may differentiate between these observed associations are various mediating pathways (Mikulincer & Shaver, 2012). It is important to emphasize

however that although insecure attachment may be thought to increase the risk of developing mental health difficulties, it should not be regarded as pathological or as inevitably leading to psychopathology (Sroufe, 2005). This is similar for secure attachment, although it may protect against psychopathology, it should not be regarded as insurance for mental health (Sroufe, 2005). The association between insecure attachment and psychosis will be discussed in the following sections.

1.4 Attachment and psychosis

1.4.1 Insecure attachment as a risk factor for developing psychosis

Psychotic symptoms have shown to typically develop in late adolescence and early adulthood (van Os & Kapur, 2009). Although much of the existing research on psychosis has focused on bio-genetic determinants of this high-risk period (for example, impaired neurodevelopment; Weinberger, 1996), the development of psychosis can also be understood within an attachment theory framework. Aikins et al. (2009) suggested several reasons why attachment may be more volatile during the adolescent and early adulthood years. First, that with their development of cognitive skills, adolescents may begin to re-evaluate their attachment related experiences which may subsequently lead to changes in attachment representations. Second, that during the adolescent years there may be more conflict between the adolescent and their parents which may also challenge attachment representations. Finally, that the adolescent years may be associated with increased stressors and negative life events that may challenge and overwhelm the adolescent, such as dealing with first romantic breakups, and with the death of a grandparent. Aikins et al. (2009) suggest that adolescents could be more affected by such events because of their limited yet developing self-regulation and cognitive skills.

1.4.2 Theories of the role of attachment in psychosis

Several theories have specifically attempted to explain the role of attachment in psychosis. Gumley and Schwannauer (2006) propose that psychosis is an affect dysregulation disorder that can be understood within an attachment theory framework. They suggest that early attachment experiences will have an impact on the way individuals modulate affect, so that individuals with a secure attachment figure will develop a range of strategies that they can use to adapt to various situations; for example they will be able to tolerate negative affect. In comparison, individuals with a frightening and/or frightened attachment figure will develop limited strategies, and will subsequently have a deregulated and disorganised regulation of affect.

Liotti (2006) suggests that disorganised attachment is essentially a dissociative process, and argues that this attachment style increases vulnerability to develop fragmented states of mind in the face of traumatic experiences (Liotti, 1992). Liotti and Gumley (2008) further propose that mentalisation may be an important factor in determining whether disorganised attachment and traumatic experiences lead to developing psychosis. They propose that dissociative responses to traumatic experiences mediate the association between disorganised attachment and psychosis, but that such dissociative responses are complicated by impaired mentalisation, so that, in the face of stressful life events the reduced self-reflective capacity leaves the individual vulnerable to psychotic experiences.

Berry, Barrowclough, and Wearden (2008) suggest that the maintenance of psychotic symptoms can be understood within an attachment system. In their longitudinal study they observed that an increase in both positive and negative

symptoms was associated with increased insecure attachment, proposing that a meaningful relationship exists between the two phenomena. In a separate study Berry, Band, Corcoran, Barrowclough, and Wearden (2007) suggest that insecure attachment can increase sensitivity to negative responses from others, criticism, and future stress. It is possible that the link observed between attachment and symptoms may exist through these cognitive and affective domains.

1.4.3 Research linking attachment to psychosis

Research has consistently demonstrated an association between insecure attachment and psychosis. In a large epidemiological study, Mickelson, Kessler, and Shaver (1997) showed that insecure adult attachment was associated with schizophrenia. Similar associations have since been replicated in both clinical (Berry et al., 2008; Dozier & Lee, 1995; Korver-Nieberg, Meijer, de Haan, Berry, & Ponizovsky, 2015) and non-clinical samples (Berry et al., 2007; Berry et al., 2006). In a systematic-review good evidence of an association between avoidant attachment and positive symptoms was shown, and modest evidence of an association between anxious attachment and positive symptoms (Gumley, Taylor, Schwannauer, & MacBeth, 2014). Only one study concluded that insecure attachment was not associated with psychotic symptoms (MacBeth, Gumley, Schwannauer, & Fisher, 2011), however this study used the AAI approach to measure attachment and only one other study by Dozier and Lee (1995) used the AAI, all the other studies mentioned used self-report questionnaires. The study's the sample size was also relatively small (34), which suggests a possible lack of symptom variance, and co-occurring symptoms were not controlled for.

Although these studies are useful in outlining the associations between insecure attachment and psychosis Gumley and Read (2008) propose that exploring attachment in relation to schizophrenia may not be that informative. As discussed in a previous section on insecure attachment and psychopathology, Gumley and Read (2008) argue that insecure attachment is associated with most diagnostic categories, and they further suggest that investigating associations between attachment and symptoms of psychosis may be more informative. Berry et al. (2006) similarly propose that this approach is beneficial and suggest that it may increase understanding of the psychological mechanisms involved in those specific relationships.

1.5 Attachment and paranoia

1.5.1 Theories of the role of attachment in paranoia

Several theories specifically linking insecure attachment to paranoia have been proposed. Bentall and Fernyhough (2008) propose that, in individuals who have an insecure attachment style, repeated number and chronic victimising experiences will exacerbate negative feelings of the self and provoke an externalising attributional style, where negative events are assumed to be caused by others, leading to paranoid thinking. Similarly, Garety et al. (2001) propose that traumatic experiences in childhood can lead to developing negative beliefs about the self and others, which can facilitate low self-esteem and external attributions, and in doing so, contribute to developing paranoid thinking.

1.5.2 Research linking attachment specifically to paranoia

Several research studies have supported these theories. In non-clinical samples, Meins, Jones, Fernyhough, Hurndall, and Koronis (2008) found that

anxious attachment was associated with paranoia, and Berry et al. (2006) found that attachment anxiety and attachment avoidance were both associated with paranoia and hallucinations. In clinical samples, Dozier, Stevenson, Lee, and Velligan (1991), and Dozier and Lee (1995) found that individuals with a schizophrenia diagnosis, who experience paranoia, had a dismissing-avoidant attachment style. Ponizovsky, Vitenberg, Baumgarten-Katz, and Grinshpoon (2011) found that paranoia is associated with preoccupied attachment, while hallucinations was associated with fearful attachment. Korver-Nieberg et al. (2015) showed that attachment anxiety and avoidance were both associated with severity of hallucinations and paranoia. Berry, Wearden, Barrowclough, Oakland, & Bradley (2012) found that avoidant attachment was associated with auditory hallucinations. It has been suggested that comorbid symptoms of psychosis may confound predictors (Pickering et al., 2008), and an important limitation of all of these studies is that they did not appropriately control for comorbidity.

So far only two studies have shown that insecure attachment is *specifically* associated with paranoia and not hallucinations. In a non-clinical study Pickering et al. (2008) showed that, once the occurrence of hallucinations and paranoia was controlled for, attachment anxiety and attachment avoidance predicted paranoia but not hallucinations. In a clinical study Wickham, Sitko, and Bentall (2015) similarly found that both attachment dimensions were specifically associated with paranoia and not hallucinations, once comorbid symptoms were controlled for.

1.6 Aims and outline of the present thesis

This thesis expands on previous research which suggests that paranoia can be understood within an attachment theory framework, by examining several gaps that

have limited our understanding of this association. This is achieved by examining insecure attachment as a possible risk factor in developing paranoia following adverse childhood experiences; as a factor that may trigger paranoia in the flow of daily life; and as a factor that may be dampened in its effect on paranoia by interacting with other psychological mechanisms. All the studies in this thesis controlled for co-occurring symptoms which have been suggested to confound predictors of psychosis, especially predictors of paranoia (Pickering et al., 2008). Symptom specificity research is in its early stages, but the psychological mechanisms identified through this approach may be invaluable to informing therapeutic work.

The following chapters consist of published papers (Chapter 2), manuscripts which are under review (Chapter 3), and recently submitted manuscripts (Chapter 4).

The study presented in Chapter 2, used a large epidemiological (n=5877) dataset from the US National Comorbidity Survey. The first objective of the study was to examine whether there were associations between specific adverse childhood experiences and psychotic symptoms, as previously reported by Bentall et al. (2012). The second objective was to examine the degree to which adulthood attachment styles mediated these associations. Since it could be argued that depression plays a role in the occurrence of psychotic symptoms, depression was also included as a mediating variable in some of the analyses.

In Chapter 3, clinical (n=20) and non-clinical (n=20) participants were compared in a longitudinal study using the experience sampling method to assess various psychological phenomena, and psychotic symptoms in the flow of daily life. The objectives of the study were, first, to assess whether there are short-term fluctuations in attachment representations; second, to assess whether elevated levels

of insecure attachment predicted subsequent paranoia; third, to determine the role of self-esteem in the association between attachment insecurity of paranoia.

The study in Chapter 4, utilised a cross-sectional design on a clinical sample (n=80). The objective of the study was, first, to assess whether the anxious and avoidant attachment dimensions are specifically associated with paranoia and, second, to determine whether the association between attachment dimensions and paranoia are affected (moderated) by a second psychological process thought to be important in psychosis, dissociation.

Chapter 5, summarizes the findings, attempts to integrate them, discusses the study limitations, and then goes on to consider clinical and policy implications, and future research directions.

1.6.1 Co-author roles

The co-authors are identified with a footnote in each Chapter. Professor Mark Shevlin was a co-author in Chapter 2. Professor Shevlin provided the epidemiological dataset (National Comorbidity Survey), and provided statistical guidance with regards to mediation analyses in Mplus. Dr Noreen O’Sullivan was a co-author in Chapter 2. Dr O’Sullivan provided guidance with the interpretation of indirect effects. Professor Richard Bentall and Professor William Sellwood provided guidance with the manuscript write up. All of the co-authors proofread this chapter for publication. Dr Filippo Varese was a co-author in Chapter 3. Dr Varese provided statistical guidance with regards to multilevel modelling using Stata. Amy Hammond was acknowledged in Chapter 3, she was an undergraduate student who collected part of the control sample data. Some of the control sample data, and all the clinical sample data was collected by myself under the supervision of Professor Richard

Bentall. Professor Richard Bentall and Professor William Sellwood provided guidance with the manuscript write up. All of the co-authors proofread this chapter for publication. Professor Richard Bentall and Professor William Sellwood provided guidance with the manuscript in Chapter 4. The clinical data was collected by myself, and the statistical analysis was also completed by myself under the supervision of Professor Richard Bentall. All of the co-authors proofread this chapter for publication.

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Chapter 2

Associations between specific psychotic symptoms and specific childhood adversities are mediated by attachment styles: An analysis of the National Comorbidity Survey²

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2.1 Abstract

Accumulated evidence over the past decade consistently demonstrates a relationship between childhood adversity and psychosis in adulthood. There is some evidence of specific associations between childhood sexual abuse and hallucinations, and between insecure attachment and paranoia. Data from the National Comorbidity Survey were used in assessing whether current attachment styles influenced the association between adverse childhood experiences and psychotic symptoms in adulthood. Hallucinations and paranoid beliefs were differentially associated with sexual abuse (rape and sexual molestation) and neglect, respectively. Sexual abuse and neglect were also associated with depression. The relationship between neglect and paranoid beliefs was fully mediated via anxious and avoidant attachment. The relationship between sexual molestation and hallucinations was independent of attachment style. The relationship between rape and hallucinations was partially mediated via anxious attachment; however this effect was no longer present when depression was included as a mediating variable. The findings highlight the importance of addressing and understanding childhood experiences within the context of current attachment styles in clinical interventions for patients with psychosis.

2.2 Introduction

Recent meta-analyses have confirmed that a wide range of adverse experiences in childhood are associated with psychosis (Matheson, Shepherd, Pinchbeck, Laurens, & Carr, 2013; Varese et al., 2012a). Some of these adverse experiences possibly involve disruptions of early attachment relationships leading to adaptations in attachment style. For example, in several case control studies, psychotic patients have reported an increased rate of early parental loss due to permanent separation or death (Agid et al., 1999; Morgan et al., 2007), and in a prospective cohort study the risk of developing psychosis increased for children reported as unwanted during pregnancy (Myhrman, Rantakallio, Isohanni, Jones, & Partanen, 1996). Experiences of early victimization such as sexual abuse have similarly been associated with a later risk of psychosis (Read, van Os, Morrison, & Ross, 2005). These findings have now been replicated (e.g. Bebbington et al., 2004; Bebbington et al., 2011; Shevlin et al., 2011) and similar results have been found in subclinical populations (Janssen et al., 2004).

It has sometimes been argued that patients' retrospective accounts of their adverse histories may be biased (Susser & Widom, 2012). However, Fisher et al. (2011) found that patients were quite reliable when their baseline reports were compared to accounts provided at 7-year follow ups. Another study found that 74% of patients were able to validate their histories from other sources; the remaining patients either made no attempt or were unable to regardless of active attempts (Herman & Schatzow, 1987). A recent meta-analysis of case-control, prospective, and epidemiological studies reported strikingly similar odds ratios of exposure to childhood adverse experiences between prospective and retrospective study designs

in individuals with psychosis, providing reassurance about the results from retrospective designs (Varese et al., 2012a).

Some research has suggested that different psychotic symptoms are associated with distinct childhood adverse experiences. The most consistent finding is of a specific association between a history of childhood sexual abuse and hallucinatory experiences in adulthood (Hammersley et al., 2003; Read, Agar, Argyle, & Aderhold, 2003). However, these studies did not control for the impact of co-occurring symptoms on such associations. Recently, Bentall, Wickham, Shevlin, and Varese (2012) similarly found childhood sexual abuse (rape) was specifically associated with hallucinations, while being brought up in institutional care was specifically associated with paranoia (persecutory beliefs); however, the significance of these relationships was dependent on controlling for the co-occurrence of the corresponding clinical symptom in each symptom relationship.

These kinds of specificities can provide clues to the underlying psychological mechanisms that form part of the response to adverse experiences and are meaningfully related to psychiatric illness (Bentall & Fernyhough, 2008). Dissociation, for example, is characterised by detachment from ongoing reality, and in recent studies has been shown to account for the association between sexual abuse and hallucinations (Varese, Barkus, & Bentall, 2012b). This finding is consistent with research which shows that sexual abuse, particularly by a close relative, is likely to produce a dissociative reaction (Chu & Dill, 1990). Garety et al. (2001) have proposed that adverse childhood experiences can influence the development of negative schemas about the self and others, biasing attributions of cause towards external sources, and in doing so, contributing to the subsequent development of paranoid delusions. Bentall and Fernyhough (2008) have suggested that insecure

attachment, which can link to difficulties in trusting others, is another factor that can produce a paranoid attributional style, and that paranoia is therefore especially likely to develop as a consequence of early insecure attachment relationships. This hypothesis is consistent with the finding that being raised in institutional care is specifically associated with paranoia (Bentall et al., 2012), and with the finding that in a nonclinical sample, subclinical paranoia was shown to be associated with insecure attachment styles (Pickering, Simpson, & Bentall, 2008). Of course, we would not expect a perfect fit between type of adverse experience, the type of psychological response it induces, and its consequences for future symptom presentation (whereas sexual abuse tends to provoke dissociative reactions, it may sometimes – for example depending on the perpetrator and the response of caregivers – lead to insecure attachment relations also).

Attachment theory is concerned with the emotional bonds infants form with their primary caregivers to establish a feeling of security and safety. Interactions with primary caregivers are therefore characterized by proximity seeking and maintaining behaviours. Over time the child's perception of these interactions affect the formation of internal working models of the self and others (Bowlby, 1973). A positive working model is formed when the primary caregiver is seen as responsive, accessible, and trustworthy, leading to the development of secure attachment (Bowlby, 1980). Conversely, adverse interactions lead to a negative working model of others as unpredictable and unavailable (Gamble & Roberts, 2005). Working models act as archetypes throughout the lifespan, helping individuals interpret and anticipate others' behaviour (Bowlby, 1973). Although early interactions are thereby thought to structure later relationships, attachment organization is not static throughout the lifespan and internal working models may adapt as a function of

current relationship experiences or significant life events (Cozzarelli, Karafa, Collins, & Tagler, 2003; Weinfield, Whaley, & Egeland, 2004).

Hazan and Shaver (1987) outlined a three-category model of adult attachment styles. The secure style reflects a positive view of others and the self. An individual with an anxious style (preoccupied) feels unworthy of love and seeks to gain approval and acceptance from others, reflecting a positive view of others and a negative view of the self. The avoidant (dismissing) style reflects a negative view of others and a positive view of the self, so that the individual feels worthy of love yet, because others are untrustworthy and rejecting, avoids close relationships.

Bartholomew and Horowitz (1991) added a fourth style to this model. A fearful style reflects a negative view of both others and the self. An individual with a fearful attachment style feels unworthy of love and avoids relationships to protect against rejection.

Although insecure attachment has been implicated in various psychopathologies, for example in PTSD (Muller, Sicoli, & Lemieux, 2000), eating disorders (Ward et al., 2001), obsessive compulsive disorder (Myhr, Sookman, & Pinard, 2004), bipolar 1 disorder (Morriss, van der Gucht, Lancaster, & Bentall, 2009) and ADHD (Clarke, Ungerer, Chahoud, Johnson, & Stiefel, 2002), patterns of insecure attachment should not to be viewed as always pathological, or as inevitably leading to pathology. Nonetheless, insecure attachment styles may act to increase the likelihood of mental health difficulties compared to patterns of secure attachment. Similarly, a secure attachment style should not to be viewed as insurance for well-being, but rather as a protective factor against pathology (Sroufe, 2005). This account is consistent with previous studies that have shown that individuals with a history of adverse experiences have higher levels of insecure attachment (Limke, Showers, &

Zeigler-Hill, 2010; Riggs & Kaminski, 2010; Waters, Hamilton, & Weinfield, 2000a), but that secure attachment is a resilience factor in psychological well-being regardless of trauma history (Dieperink, Leskela, Thuras, & Engdahl, 2001).

There has been very little research exploring the degree to which attachment-styles influence the relationship between adverse experiences in childhood and psychotic symptoms in adulthood. There is evidence that avoidant attachment is associated with positive symptoms of psychosis, and modest evidence that anxious attachment is also associated with positive symptoms of psychosis (Gumley, Taylor, Schwannauer, & MacBeth, 2013). In nonclinical samples however, it has been shown that insecure attachment predicts paranoia but not hallucinations (Pickering et al., 2008). Only one study of patients with first episode psychosis concluded that attachment is unrelated to psychotic symptoms (MacBeth, Gumley, Schwannauer, & Fisher, 2011). However, this finding may reflect the study's small sample size (34), possible lack of variance in the symptoms, and no adjustment for co-occurring symptoms.

The current study used data from the National Comorbidity Survey (NCS; 1990-1992). The first aim was to determine whether, within this sample, there were specific associations between types of childhood adversity and psychotic symptoms, as previously reported by Bentall et al. (2012) in an analysis of data from the British Adult Psychiatric Morbidity Survey (APMS; 2007). It was predicted that childhood sexual abuse would be associated with hallucinations while controlling for paranoia, and that neglect (as an indicator of disrupted attachment relations) during childhood would be associated with paranoia while controlling for hallucinations. The second aim of the study was to explore the degree to which attachment styles mediated the relationships between childhood adverse experiences and psychotic symptoms. It

was predicted that only those adversities associated with paranoia and not hallucinations would be mediated by insecure attachment.

2.3 Method

2.3.1 Participants and Procedure

The NCS was a nationwide epidemiological investigation of the prevalence and correlates of DSM III-R disorders in non-institutionalised persons aged 15-54 years in the 48 coterminous states of America. Based on stratified, multistage area probability sampling, Part I of the survey employed 8098 participants, and Part II employed a subsample of 5877 participants. The analyses in this paper were performed on the Part II subsample. For a complete description of the NCS see Kessler (1994).

2.3.2 Measures

2.3.2.1 Childhood Adverse Experiences

Information about adverse experiences was obtained from the ‘Life Event History’ module of the University of Michigan Composite International Diagnostic Interview (UM-CIDI; Wittchen & Kessler, 1994). Participants were provided with a numbered list of adverse experiences, and asked for example “Did event number six ever happen to you?” Identifying types of adverse experiences with a number is associated with an increased willingness to disclose such information (Kessler, Borges, & Walters, 1999). Adverse experiences were represented by the following seven events (scored ‘no’ (0) or ‘yes’ (1)):

1. You witnessed someone being badly injured or killed.

2. You were raped (someone had sexual intercourse with you when you did not want to by threatening you or using some degree of force).
3. You were sexually molested (someone touched or felt your genitals when you did not want them to).
4. You were seriously physically attacked or assaulted.
5. You were physically abused as a child.
6. You were seriously neglected as a child.
7. You were threatened with a weapon, held captive, or kidnapped.

For all questions except 5 and 6, participants' age when the event first occurred was elicited, indicating if it was before age 16.

2.3.2.2 *Psychosis Items*

Information relating to lifetime psychotic symptoms was obtained from 13 questions on the 'Beliefs and Experiences' module of the UM-CIDI (Wittchen & Kessler, 1994). Based on exploratory and confirmatory factor analyses, we extracted two factors measuring paranoia and hallucinations, mapping well onto previous research (Murphy, Shevlin, Adamson, & Houston, 2010). The responses from the questions in each factor (scored 'no' (0) or 'yes' (1)) were added to calculate paranoia and hallucination severity scores.

Paranoia Severity was assessed on a scale from 0-3, on the following questions:

1. Have you ever believed that people were spying on you or following you?

2. Have you ever believed that you were being secretly tested or experimented on, that someone was plotting against you, or that someone was trying to poison or hurt you?

3. Have you ever believed that you were being sent special messages through television or the radio, or that a program had been arranged just for you alone?

Hallucination Severity was assessed on a scale from 0-4, on the following questions:

1. Have you ever had the experience of seeing something or someone that others present could not see – that is, had a vision when you were wide awake?

2. Have you ever had the experience of hearing things that other people could not hear, such as noises or a voice?

3. Have you ever been bothered by strange smells around you that nobody else was able to smell, perhaps even ‘odors’ coming from your own body?

4. Have you ever had unusual feelings inside or on your body, like being touched when nothing was there or feeling something moving inside your body?

2.3.2.3 *Major Depression Severity*

Lifetime major depression was assessed on a scale from 0 to 9. The questions (scored ‘no’ (0) or ‘yes’ (1)) were obtained from the ‘Sadness’ module of the UM-CIDI (Wittchen & Kessler, 1994) and assessed depressed mood, loss of interest,

weight and appetite changes, sleep disturbances, psychomotor agitation, loss of energy, feelings of worthlessness, trouble concentrating, and recurrent death thoughts. Severity scores were derived using an algorithm (Zhao, Kessler, & Wittchen, 1994).

2.3.2.4 Attachment Style

Current attachment style was assessed using three 4-point rating scales (1 = *not at all like me* and 4 = *a lot like me*) obtained from the Adult Attachment Questionnaire (AAQ; Hazan & Shaver, 1987) which presented three brief paragraphs describing secure, anxious, and avoidant styles. Participants were asked to rate how closely each style resembled their attachment behaviours. For statistical analyses secure attachment was reverse coded so that high scores indicated a lack of attachment security. The three attachment styles were significantly correlated ($p < .001$); secure was negatively correlated with anxious ($r = -.12$) and avoidant ($r = -.35$); anxious and avoidant were positively correlated ($r = .26$).

2.3.2.5 Demographic Confounds

Sexes ('male' (0), 'female' (1)) and age (years) were considered as possible confounding variables.

2.3.3 Data Analytic Plan

The analyses were conducted in three linked phases. First, the direct effects (c paths) between the independent variables (witnessing injury or killing, rape, sexual molestation, physical attack or assault, physical abuse, neglect, and being held captive or threatened with a weapon) and the dependent variables (paranoia, hallucinations, and depression) were estimated. The second phase introduced the

mediating attachment variables (secure, avoidant, and anxious). This model included the direct effects between the independent variables and the mediators (*a* paths), the direct effects between the mediators and the dependent variables (*b* paths), and the direct effect between the independent and dependent variables while controlling for the mediators (*c'* paths). The mediated effects are the products of the *a* and *b* paths. The third analysis estimated the same model while controlling for demographic confounds (age and sex). This multiple-mediator model is presented in Figure 2.1.

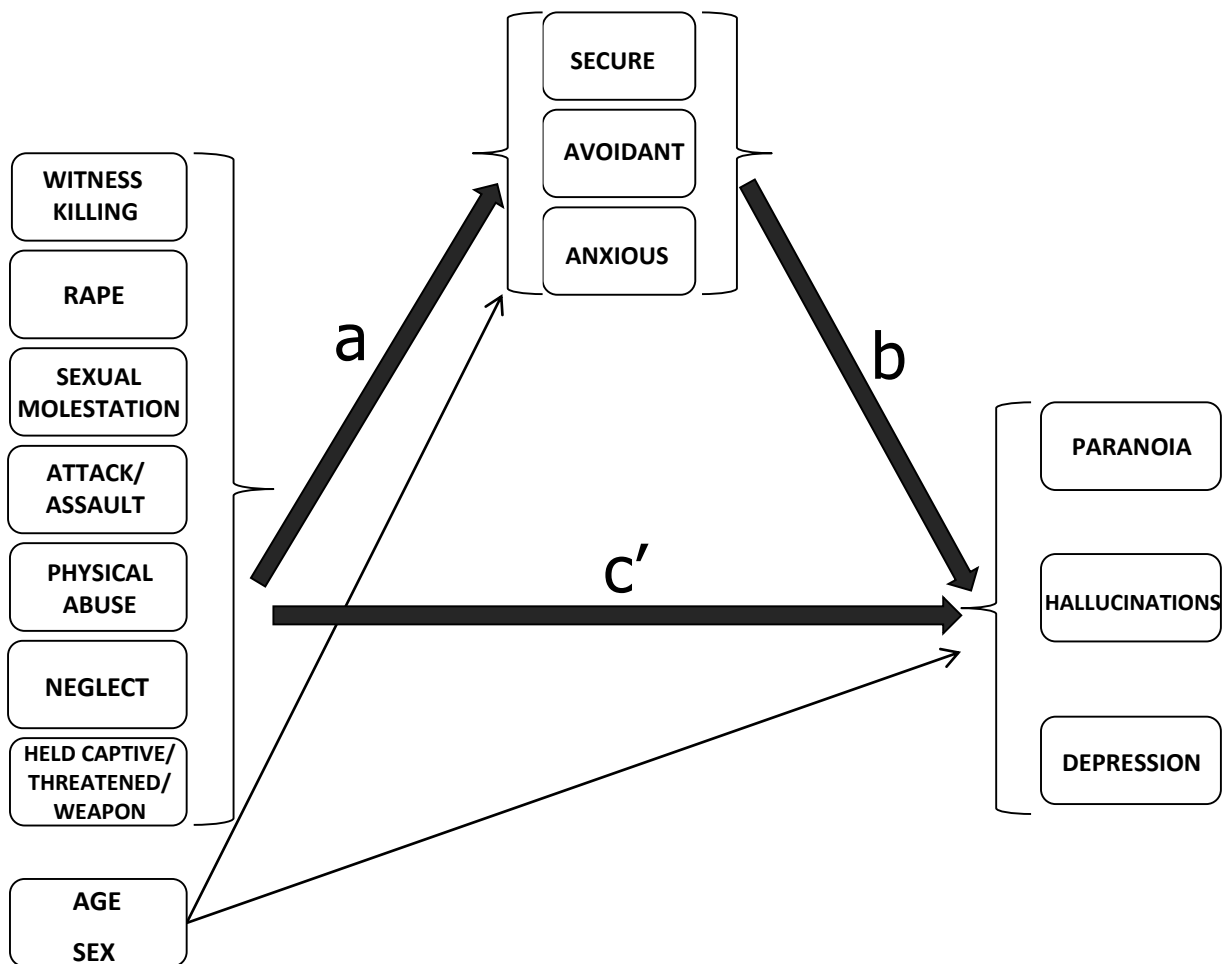


Figure 2.1

Illustration of the multiple-mediator model.

The term ‘mediating effect’ is used in two contexts. First, when a previously significant path c becomes non-significant ($c' = 0$) with the inclusion of the mediators in the model, and at least one mediating effect is significant: this suggests that the relationship between the independent variable and dependent variable is fully mediated. Second, when a previously significant path c remains significant as path c' , and at least one mediating effect is significant: this suggests that the relationship between the independent and dependent variable is partially mediated. The term ‘indirect effect’ is used when a previously non-significant path c remains non-significant as path c' , but at least one mediating variable is significantly associated with an independent variable and a dependent variable: this suggests that any relationship between the independent variable and dependent variable is entirely contingent on the mediator.

The models were specified using Mplus 6.11 (Muthén & Muthén, 1998-2011). All models were estimated using the maximum likelihood (ML) estimator with the appropriate weight variable. The statistical significance of mediating and indirect effects was assessed using bootstrapped bias-corrected percentile based confidence intervals (Efron, 1987; Efron & Tibshirani, 1993) based on 1000 bootstrap draws. If zero was not within the 95% intervals of the bootstrapped samples, then the mediating/indirect effect was considered statistically significant.

2.4 Results

The frequencies of childhood adverse experiences before the age of 16 were: witnessed injury or killing $N = 519$ (8.8%), raped $N = 148$ (2.5%), sexually molested $N = 371$ (6.3%), physically attacked or assaulted $N = 178$ (3.0%), physically abused

$N = 246$ (4.2%), neglected $N = 164$ (2.8%), and being held captive or threatened with a weapon $N = 236$ (4.0%).

2.4.1 Direct Effects

The direct effects (*c* paths) of childhood adverse experiences on paranoia were all significant except for rape and sexual molestation. The direct effects on hallucinations were all significant except for neglect. Finally, the direct effects on depression were all significant except for physical attack/assault and being held captive/threatened with a weapon; these results are reported in Table 2.1. The direct effects (*a* paths) of childhood adverse experiences on anxious attachment were all non-significant except for neglect and rape. The direct effects on avoidant and secure (reversed) attachment were all non-significant except for neglect and being held captive/threatened with a weapon; these results are reported in Table 2.2. The direct effects (*b* paths) of attachment on paranoia, hallucinations, and depression were all significant except for secure (reversed) attachment; these results are reported in Table 2.3.

Table 2.1

Results of direct effects (c paths) between adverse events and symptoms.

Adverse Childhood Event	Paranoia <i>B (SE)</i>	Hallucinations <i>B (SE)</i>	Depression <i>B (SE)</i>
Witness Injury/Killing	0.091 (.029)**	0.170 (.043)***	0.657 (.161)***
Rape	0.092 (.065)	0.396 (.110)***	0.961 (.321)**
Sexual Molestation	0.029 (.029)	0.240 (.058)***	1.144 (.192)***
Physical Attack/Assault	0.137 (.052)**	0.232 (.087)**	0.338 (.266)
Physical Abuse	0.168 (.067)*	0.227 (.085)**	0.934 (.247)***
Neglect	0.167 (.074)*	0.181 (.096)	0.681 (.302)*
Held Captive/Threaten Weapon	0.206 (.048)***	0.288 (.079)***	0.268 (.238)

Note: B = unstandardised b coefficients; SE = standard error.

p < .05; **p < .01; *p < .001*

Table 2.2

Results of direct effects (a paths) between adverse events and attachment styles.

Adverse Childhood Event	Secure (reversed) <i>B (SE)</i>	Avoidant <i>B (SE)</i>	Anxious <i>B (SE)</i>
Witness Injury/Killing	-0.022 (.059)	-0.001 (.067)	-0.010 (.050)
Rape	0.055 (.106)	0.160 (.108)	0.391 (.143)**
Sexual Molestation	-0.041 (.062)	0.029 (.067)	0.081 (.068)
Physical Attack/Assault	0.023 (.090)	0.026 (.119)	-0.021 (.084)
Physical Abuse	0.127 (.083)	0.147 (.092)	0.095 (.075)
Neglect	0.214 (.097)*	0.484 (.116)***	0.542 (.097)***
Held Captive/Threaten Weapon	0.266 (.076)***	0.321 (.091)***	0.135 (.078)

Note: B = unstandardised b coefficients; SE = standard error.

p < .05; **p < .01; *p < .001*

Table 2.3

Results of direct effects (b paths) between attachment styles and symptoms.

Attachment Style	Paranoia <i>B (SE)</i>	Hallucinations <i>B (SE)</i>	Depression <i>B (SE)</i>
Secure (reversed)	-0.001 (.008)	0.000 (.011)	0.076 (.046)
Avoidant	0.038 (.008)***	0.057 (.012)***	0.364 (.045)***
Anxious	0.078 (.011)***	0.073 (.014)***	0.412 (.052)***

Note: B = unstandardised b coefficients; SE = standard error.

****p < .001*

2.4.2 Mediating and Indirect Effects (*c'*, see Table 2.4)

When the effects of the mediator variables and confounding variables were included in the model, avoidant and anxious attachment fully mediated the relationship between neglect and paranoia. Avoidant attachment also partially mediated the relationship between being held captive/threatened with a weapon and paranoia. Unexpectedly, rape had an indirect relationship with paranoia through anxious attachment. In the full mediation, 100% of the total association between

neglect and paranoia is attributable to anxious and avoidant attachment. In the case of the partial mediation and indirect effects it is not possible to calculate a meaningful proportion of the effect attributed to a particular event-mediator-symptom pathway but 1.3% of the total effect on paranoia was attributable to avoidant attachment while 13.0% of the total effect on paranoia was attributable to anxious attachment.

Anxious attachment partially mediated the relationship between rape and hallucinations. Avoidant attachment partially mediated the relationship between being held captive/threatened with a weapon and hallucinations. Lastly, neglect had an indirect relationship with hallucinations through avoidant and anxious attachment. However, in the case of these partial mediations and indirect effect, only 1.0% of the total effect on hallucinations is attributable to avoidant attachment, while only 3.0% of the total effect on hallucinations is attributable to anxious attachment.

Anxious attachment fully mediated the relationship between rape and depression. Avoidant and anxious attachment also fully mediated the relationship between neglect and depression. Lastly, being held captive or threatened with a weapon had an indirect relationship with depression through avoidant attachment. In the full mediation 100% of the total effect on depression is attributable to anxious and avoidant attachment. In the indirect effect 7.6% of the total effect on depression was attributable to avoidant attachment.

Table 2.4

Results of direct effects (c' paths) between adverse events and symptoms while controlling for mediators and confounding variables.

<i>Symptom/Adverse Childhood Event</i>	<i>B</i>	<i>SE</i>	<i>95% CI</i>	<i>β</i>
Paranoia				
Witness Injury/Killing	0.086	0.024	0.039 – 0.133	0.058**
Rape	0.053	0.054	-0.053 – 0.159	0.020
Sexual Molestation	0.026	0.028	-0.029 – 0.081	0.015
Physical Attack/Assault	0.140	0.048	0.046 – 0.234	0.057**
Physical Abuse	0.156	0.050	0.058 – 0.254	0.073*
Neglect	0.121	0.067	-0.010 – 0.252	0.047
Held Captive/Threaten Weapon	0.179	0.040	0.101 – 0.257	0.083***
Sex	0.004	0.011	-0.018 – 0.026	0.005
Age	-0.003	0.001	-0.005 – -0.001	-0.064***
Hallucinations				
Witness Injury/Killing	0.165	0.035	0.096 – 0.234	0.077***
Rape	0.347	0.090	0.171 – 0.523	0.088***
Sexual Molestation	0.230	0.051	0.130 – 0.330	0.092***
Physical Attack/Assault	0.243	0.080	0.086 – 0.400	0.068**
Physical Abuse	0.214	0.069	0.079 – 0.349	0.069**
Neglect	0.137	0.091	-0.041 – 0.315	0.036
Held Captive/Threaten Weapon	0.261	0.067	0.130 – 0.392	0.083***
Sex	0.037	0.015	0.008 – 0.066	0.030*
Age	-0.004	0.001	-0.006 – -0.002	-0.061***
Depression				
Witness Injury/Killing	0.751	0.126	0.504 – 0.998	0.088***
Rape	0.539	0.276	-0.002 – 1.080	0.035
Sexual Molestation	0.878	0.159	0.566 – 1.190	0.088***
Physical Attack/Assault	0.506	0.232	0.051 – 0.961	0.036*
Physical Abuse	0.822	0.220	0.391 – 1.253	0.067***
Neglect	0.252	0.267	-0.271 – 0.775	0.017
Held Captive/Threaten Weapon	0.225	0.191	-0.149 – 0.599	0.018
Sex	0.710	0.062	0.588 – 0.832	0.146***
Age	0.004	0.003	-0.002 – 0.010	0.018

Note: B = unstandardised b coefficients; SE = standard error; CI = confidence interval; β = standardised b coefficients.

p < .05; **p < .01; *p < .001*

2.4.3 *Depression as a Mediator*³

As psychosis is associated with emotional reactivity (Myin-Germeys & van Os, 2007), it could be argued that depression plays a role in the occurrence of psychotic symptoms. When the effect of depression was included as a mediator variable (along with attachment styles) instead of a dependent variable, both avoidant and anxious attachment continued to fully mediate the relationship between neglect and paranoia. Rape continued to have an indirect relationship with paranoia through anxious attachment. Depression partially mediated the relationship between physical abuse and paranoia, and lastly sexual molestation had an indirect relationship with paranoia through depression. In the full mediation 100% of the total effect on paranoia is attributable to anxious and avoidant attachment. In the partial mediation and indirect effects 5.4% of the total effect on paranoia is attributable to anxious attachment while 17.2% of the total effect on paranoia is attributable to depression.

Neglect continued to have an indirect relationship with hallucinations through avoidant and anxious attachment. Depression partially mediated the relationship between witnessing an injury/killing and hallucinations, the relationship between sexual molestation and hallucinations, and the relationship between physical abuse and hallucinations. In the indirect effects and partial mediations 8.3% of the total effect on hallucinations is attributable to depression, while 0.9% of the total effect on hallucinations is attributable only to avoidant attachment and not anxious attachment.

³ See supplementary materials in Appendix A.

2.5 Discussion

A primary aim of the present study was to further test for relationships between specific types of adversity and specific types of psychotic symptoms as reported in previous studies. Although Shevlin et al.'s (2007) previous analysis of the NCS showed that childhood sexual abuse (rape and sexual molestation) was associated with hallucinations, that analysis did not consider other symptoms or use appropriate statistical methods to control for the impact of co-occurring symptoms and therefore could not test for the specificity effects predicted here. The direct effects observed in this US sample replicate the previous findings reported by Bentall et al. (2012) using a British sample from APMS (2007), showing specific associations within the psychotic domain between sexual abuse (rape and sexual molestation) and hallucinations, and between neglect and paranoid beliefs, but only when co-occurring symptoms were controlled for. Although neglect and institutional care (the childhood adversity linked to paranoia in the British sample) are not the same, there is evidence that neglect without physical separation can have just as grave effects as physical separation from primary caregivers (Ainsworth, 1962). Neglect is the absence of physical, medical, emotional, or educational needs at a time essential for child development. Regardless of who the caregiver is or their intention, a neglected child is devoid of cognitive stimulation, individual attention, and/or emotional affection (Perry, 2002).

The second aim of the current study was to explore how attachment influenced the relationship between childhood adverse experiences and psychotic symptoms. Based on previous research on the psychological mechanisms believed to underlie psychotic symptoms (Bentall & Fernyhough, 2008), it was predicted that insecure attachment would specifically influence associations between adverse

experiences and paranoia, but not hallucinations. The strongest and most consistent finding from these analyses was that the association between neglect and paranoia was fully mediated by both anxious and avoidant attachment. We also found, as expected, that the association between sexual molestation and hallucinations could not be explained in terms of insecure attachment. It has been shown that dissociation appears to be more important as a specific mechanism mediating between childhood trauma and hallucinations (Perona-Garcelán et al., 2012; Varese et al., 2012b). Insecure attachment was also unable to explain the association between sexual molestation and depression. Although, contrary to our predictions, attachment difficulties did seem to partially explain the relationship between rape and hallucinations, this effect was no longer significant when depression was included as a mediator – see below.

The initial associations between being held captive/threatened with a weapon and both paranoia and hallucinations were partially mediated by avoidant attachment. It seems likely that that threatening experiences can induce hostile feelings or wary attitudes towards others resulting in avoiding close relationships. With regard to the remaining adverse experiences in the model, the addition of attachment did not alter the associations between witnessing an injury/killing and paranoia, hallucinations, and depression; physical abuse and paranoia, hallucinations, and depression; and physical attack/assault, and paranoia, hallucinations, and depression suggesting that other psychological mechanisms are required to explain these associations. Although it is not possible to consider other possible mechanisms in detail here, we have already noted that previous research has shown that dissociative mechanisms may be particularly important in hallucinations (Perona-Garcelán et al., 2012; Varese et al.,

2012b) and it is certainly possible that they play a role in such events as witnessing a killing, assault or traumatic injury.

Although our findings clearly suggest that insecure attachment is part of an explanatory mechanism by which the nature of the relationship between certain adverse experiences and specific symptoms can be understood, a major challenge in deriving inferences from mediation analyses centres on the casual sequence among variables (Mathieu & Taylor, 2006). From our mediation analysis, it cannot be definitively ascertained whether insecure attachment was present prior to or developed following the experience of an adverse event. It could well be that insecure attachment sets the stage for a psychogenic response to adverse experiences (Liotti & Gumley, 2008) but it could also be that adverse experiences distort attachment representations (Waters et al., 2000b). It also could not be ascertained whether insecure attachment was present prior to the occurrence of psychotic symptoms and, therefore, the possibility that insecure attachment is a consequence of psychosis cannot be ruled out in the absence of longitudinal data. All we can say is that the data are consistent with the mediational pathways we have hypothesized. It also might be argued that the participants' recall of adverse experiences might be affected by their symptoms but, as reviewed in the introduction, there is evidence that this is unlikely.

In addition to the above described mediating effects, a number of indirect effects were detected. Rape was associated with paranoia via anxious attachment, neglect was associated with hallucinations via anxious and avoidant attachment, and being held captive/threatened with a weapon was associated with depression through avoidant attachment. These indirect effects are difficult to interpret but again suggest the importance of attachment processes in playing a role in the chain reaction that

links a distal adverse event with the current experience of clinical symptomology (see Collins, Graham, & Flaherty, 1998, Mathieu & Taylor, 2006, and Shrouf & Bolger, 2002, for further description on indirect effects). What the indirect effects suggest is that a meaningful portion of the variability in clinical symptoms is contingent on the co-occurrence of adverse experiences with insecure attachment. This may be of very high clinical relevance, as it suggests that, if the insecure attachment were targeted in treatment, then the ongoing impact of the adverse experience on current symptomology could be mitigated.

As an affective pathway has been proposed in the relationship between childhood adverse experiences and psychotic symptoms (e.g. Myin-Germeys & van Os, 2007), it might be argued that depression would play a strong mediating role in the relationship between adverse experiences and psychotic symptoms. In contrast, however controlling for the variability in depression only reduced the mediating role of anxious attachment on the relationship between rape and hallucinations, and the mediating role of avoidant attachment on the relationship between being held captive/threatened with a weapon and paranoia and hallucinations. The mediating effects of attachment styles between neglect and paranoia remained unaffected. These findings therefore confirm that the role of attachment in the association between adversity and psychosis cannot simply be accounted for by covariation between attachment and emotional difficulties, and suggest even greater specificity between insecure attachment and paranoia.

In addition to the difficulty of interpreting indirect effects noted above, certain limitations of the study should be considered. First, only brief symptom measures were employed, and it is possible that these captured subclinical experiences that may not exactly correspond to the experiences of patients attending

psychiatric services. However, it has been suggested that psychotic symptoms are distributed along a continuum extending from normality to increasing levels of severity, and that the difference between subclinical experiences and patient experiences of psychosis are strictly quantitative and not qualitative (van Os et al., 1999). It might be questioned whether the paranoia measure should have included an item on ideas of reference. However, our main symptom measures were derived empirically using factor analyses, and corresponded with the results obtained from previous factor analyses (Murphy et al., 2010).

Secondly, some of the questions on childhood adversity are open to subjective interpretation (e.g. questions about neglect), and ratings made by trained mental health professionals using more extensive questioning would have been preferred. We were only able to consider the presence or absence of particular adverse experiences and not their qualities. The relationship to the perpetrator, the interpretation of the event, and the duration and frequency of the adversity are likely to be important moderators. Thirdly, the NCS measured attachment using Hazan and Shaver's (1987) three-category model; four-category models that include a fearful/disorganised attachment style are now more widely used. This attachment style is potentially important, as it may be associated with symptom specificity. However, a recent review suggests that disorganised attachment is not associated with symptoms in a consistent way and that further work in this area is needed (Gumley et al., 2013). Fourthly, it has been argued that, in comparison with interview methods, self-report attachment measures, such as those used in the dataset here, tap into a conscious appraisal of attachment processes and therefore are of limited validity; however, an empirical review suggested convergent validity between self-report attachment measures and results obtained with experimental

manipulations such as implicit priming techniques and with behavioural observations (Shaver & Mikulincer, 2004). Fifthly, the NCS used multistage sampling, raising the possibility of within-cluster (geographical areas) correlations and between-cluster variance. However, the NCS data set does not provide information about the geographical locality, and other studies using the NCS have not taken a multilevel approach. Moreover, it is unlikely that any such affects would undermine the conclusions of the study. However, future research might focus on exploring whether clusters which vary, for example, in terms of social deprivation impact on attachment. Finally, the focus is on current attachment style and it would be informative to explore severity of symptoms in relation to fluctuations in attachment. Research examining the stability of attachment style using test-retest reliability of the AAQ found that approximately 30% of individuals changed their classification over a short time span (Baldwin & Fehr, 1995). This could reflect that attachment may not be a trait variable and that perhaps fluctuation in symptoms over time could be meaningfully related to fluctuations in attachment as suggested by Berry et al. (2008).

There are important clinical implications from this research. Firstly, given the consistency of the evidence now available linking adversity to psychosis, the assessment of early adverse experiences in individuals with psychosis should be routine during initial interviews. Secondly, the assessment of attachment styles in individuals with psychosis may help clinicians focus psychological interventions targeting these processes (internal models of the self and others), which may have subsequent mitigating effects on clinical symptoms. It may be possible to vary therapeutic approaches in accordance with patients' attachment styles. It may also be possible to focus specifically on attachment-related issues in conventional cognitive

behavioural interventions for patients with psychosis, for example by using techniques such as thought diaries to explore the relationship between attachment-threatening events (mild apparent rejections) and patients' interpretations of these events in daily life.

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Chapter 3

Insecure attachment predicts the occurrence of paranoia but not auditory hallucinations: An experience sampling study⁴

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3.1 Abstract

It has been proposed that insecure attachment can have adverse effects on the course of psychosis once symptoms have emerged. There is longitudinal evidence that increased insecure attachment is associated with increased severity of psychotic symptoms. The present study examined whether in the flow of daily life attachment insecurity fluctuates, and whether attachment insecurity specifically precedes the occurrence of paranoia and not auditory hallucinations. Twenty clinical participants with a psychosis-spectrum diagnosis and twenty controls were studied over 6 consecutive days using the experience sampling method (ESM). The findings revealed that fluctuations in attachment insecurity were significantly higher in the clinical group, and that elevated attachment insecurity predicted a subsequent increase in paranoia; this effect however was not observed in auditory hallucinations suggesting specificity of the effect. Finally, although previous ESM studies have shown that low self-esteem precedes the occurrence of paranoia, attachment insecurity continued to predict paranoia even when self-esteem was controlled for. The findings suggest that attachment security may be associated with a lower risk of paranoia, and that psychological interventions should address attachment beliefs and work towards establishing a sense of attachment security.

3.2 Introduction

There has been growing interest in the role attachment plays in psychosis. Research suggests that the development of insecure attachment can increase vulnerability to subsequent psychosis (Read & Gumley, 2008), and can have adverse effects on its course once symptoms have emerged (Berry, Barrowclough, & Wearden, 2007). Insecure attachment is often associated with suboptimal early-life caregiving environments and can be understood within the framework of affect regulation (Berry et al., 2007). When primary caregivers fail to alleviate distress by being unresponsive or unavailable to the child's bid for proximity, negative working models about the self and others begin to develop (Mikulincer & Shaver, 2012) and can increase one's sensitivity to future stress, criticism, and negative responses from others (Berry et al., 2007). According to adult attachment theory (Bowlby, 1973; Hazan & Shaver, 1994) these early working models are highly accessible throughout the lifespan and continue to guide behaviour in future attachment related interactions (Main, Kaplan, & Cassidy, 1985).

A large and influential epidemiological study found evidence for an association between insecure adult attachment and schizophrenia (Mickelson, Kessler, & Shaver, 1997), and although this association has been replicated in non-clinical (Berry, Band, Corcoran, Barrowclough, & Wearden, 2007; Berry, Wearden, Barrowclough, & Liversidge, 2006) and clinical samples (Berry, Barrowclough, & Wearden, 2008; Korver-Nieberg, Meijer, de Haan, Berry, & Ponizovsky, 2015) it has been suggested that it could be more informative to explore such associations in relation to specific symptoms of psychosis (Bentall, 2004). Such specificities can provide a clearer understanding of how certain psychological mechanisms are meaningfully related to the experiences of individuals with psychosis (Bentall &

Fernyhough, 2008) and, in turn this information may help clinicians focus psychological interventions appropriately. Bentall and Fernyhough (2008) proposed that insecure attachment can facilitate a paranoid attributional style so that, in the presence of other cofactors, paranoia develops as a consequence. This hypothesis has been supported by several recent findings showing specific links between insecure attachment and paranoia in both subclinical (Pickering, Simpson, & Bentall, 2008) and clinical (Wickham, Sitko, & Bentall, 2015) cross-sectional studies.

While the cross-sectional approach has been useful in beginning to outline an association between insecure attachment and paranoia, it is limited to a “snapshot” of information collected at a single time point. The information it provides cannot ascertain temporal associations, and consequently it is not entirely obvious how insecure attachment impacts on the course of psychosis, especially in relation to the maintenance of symptoms in daily life. Berry and colleagues (2008) have suggested that symptom maintenance can be understood within an attachment theory framework. In their longitudinal study they found that an increase in positive and negative symptoms was associated with increased levels of insecure attachment. Although the authors propose that fluctuations in symptoms can be meaningfully related to fluctuations in attachment style, a more intensive assessment is needed to examine how attachment insecurity is associated with the onset of specific psychotic symptoms in the flow of everyday life.

Bowlby, the father of attachment theory, conceptualised adulthood attachment as resulting from both early attachment histories and contextual factors (Bowlby, 1973). Based on the idea that working models of past relationships assist a person in new situations, attachment style has largely been viewed as being continuous across both time and contexts (Brumbaugh & Fraley, 2006). However, it

has been noted that attachment can change in the long-term during the course of life (Davila, Burge, & Hammen, 1997), and it is possible that attachment representations (currently activated schemas about the self and others) may actually fluctuate even over short periods of time. Several longitudinal studies have observed considerable attachment fluctuations regardless of whether attachment was repeatedly measured across the life span, within several months, or in a shorter time frame of a week (Baldwin & Fehr, 1995; Scharfe & Bartholomew, 1994; Waters, Merrick, Treboux, Crowell, & Albersheim, 2000). Such fluctuations have led to the conceptualisation that both state and trait internal models of attachment may exist concurrently, and that global and specific attachment models may be held by the individual (Pierce & Lydon, 2001). Trait models are associated with attachment behaviours that are considered to occur consistently over time, while behaviours towards others that are considered to occur temporarily and inconsistently reflect state models (Chaplin, Goldberg, & John, 1988). Baldwin and Fehr (1995) have made the case for attachment fluctuations as not resulting from unreliable assessment tools, but rather reflecting variability that is meaningfully impacted by contextual cues.

The experience sampling method (ESM) can enable a more detailed understanding of such fluctuations in the flow of daily life. ESM is an approach which employs a self-assessment tool to capture the frequency, intensity, and patterning of momentary mental processes and behaviours (Csikszentmihalyi & Larson, 1987), such as stress, current symptoms, current activity, and positive and negative affect (Varese, Udachina, Myin-Germeys, Oorschot, & Bentall, 2011). Compared to other longitudinal methods previously employed in attachment research, ESM employs a more intensive assessment schedule involving multiple assessments per day, therefore enabling to a more fine-grained examination of

attachment and attachment fluctuations on the presenting difficulties of individuals with psychosis. Since the information is recorded in a temporal fashion, ESM enables researchers to examine the underlying psychological mechanisms that are associated with the onset of psychotic symptoms (Myin-Germeys et al., 2009). Previous ESM studies of paranoia have focused on emotion and self-esteem, showing that both are highly fluctuating in paranoid patients (Thewissen, Bentall, Lecomte, van Os, & Myin-Germeys, 2008; Thewissen et al., 2011), and that the onset of paranoid symptoms is typically preceded by low self-esteem and elevated negative affect (Thewissen et al., 2008; Thewissen et al., 2011).

The first objective of the present study was to test whether, in everyday life, there are fluctuations in attachment. It was predicted that a higher degree of fluctuations will be present in the clinical group than the control group. The second objective of the study was to test whether, in everyday life, reports of paranoid experiences are significantly predicted by preceding elevated attachment insecurity. Since research has suggested that comorbid symptoms might confound the predictors of paranoia (Pickering et al., 2008), this study also examined the specificity of this relationship by testing whether the experience of paranoia is preceded by elevated attachment insecurity once auditory hallucinations are controlled for, and also whether attachment insecurity preceded the occurrence of auditory hallucinations. Finally, because low self-esteem has been associated with paranoia in previous ESM studies, we sought to determine whether the effect of attachment insecurity on paranoia survived after self-esteem had been controlled for.

3.3 Method

3.3.1 Participants and Procedure

Twenty clinical participants with schizophrenia spectrum diagnoses (schizophrenia, paranoid schizophrenia, schizoaffective, and non-specified psychosis) were recruited from outpatient facilities in North West England. Nineteen were taking antipsychotic medication at the time of testing. In addition 20 healthy controls with no history of mental health difficulties were recruited through flyers, e-mails, and from the University of Liverpool research participation panel. Between-group differences on demographic variables were tested using analysis of variance (ANOVA) and Pearson's χ^2 test. No significant differences were observed for age and sex, however participants in the control group spent fewer years in education (Table 3.1).

Table 3.1

Means, standard deviations, and between-group differences.

	Clinical (n=20)	Control (n=20)	t/ χ^2
Age	41.05 (12.53)	35.05 (14.11)	t(38) = 0.16 ns
Years of Education	10.95 (2.37)	12.75 (1.33)	t(29.91) = -2.96**
Sex	16 males	15 males	χ^2 (1) = 0.14 ns
Positive Symptoms	2.36 (1.65)	na	
Negative Symptoms	1.73 (1.26)	na	
General Psychopathology	1.96 (1.46)	na	
Diagnosis	Schizophrenia = 6 Psychosis NOS = 4 Schizoaffective = 2 Paranoid Schizophrenia = 8	na	

*Note: na = not applicable; NOS = not otherwise specified; ns = non-significant
**p < 0.01*

Nineteen from the clinical group and seven from the control group completed the study using a palm pilot (MAKE: Pilot Inc., TYPE: Tungsten E2), all other participants used paper diaries; based on preference/availability of palm pilots. Past

research has shown that the two methods are compatible, and that compliance rates are similar (Green, Rafaeli, Bolger, Shrout, & Reis, 2006). The ‘Experience Sampling Program’ (version 4.0) (Barrett & Feldman, 2000), installed on the palm pilots emitted a signal (bleep) at variable time points within ten equal time intervals between 8am – 10pm, over 6 consecutive days. The palm pilot beeped loudly for up to 13 minutes until the screen was tapped using a stylus pen. Long and loud beeps give people the opportunity to answer more trials by not missing assessment points (Christensen, Barrett, Bliss-Moreau, Lebo, & Kaschub, 2003). Each question appeared on the palm pilot screen individually, and participants responded by pressing a number with a stylus pen. The palm pilot would shut off if left untouched for two minutes. All responses were completed within 15 minutes of tapping the screen.

Participants who completed the study using paper diaries received six pocket sized booklets each consisting of 10 ESM assessment forms. A pre-set text message from Google Calendar prompted participants to complete the ESM assessment form and to record the time of completion. Assessment forms that were answered within 15 minutes of receiving the text message were retained for analysis as trials completed outside this time frame are less reliable and considered invalid (Delespaul, 1995). Participants who did not have a mobile phone or who preferred not to use their own were provided with one for the duration of the study.

Participants met with the researcher twice. During the first meeting the researcher conducted the Positive and Negative Syndrome Scale (Kay, Flszbein, & Opfer, 1987) with the clinical group, administered the Relationship Questionnaire (Bartholomew & Horowitz, 1991), and explained the ESM procedure. At this meeting participants completed a practice ESM assessment form/palm pilot trial to

ascertain the procedure was understood. Throughout the course of the sampling period participants were encouraged to contact the researcher if they had any questions, or if the palm pilot/pre-set text messages malfunctioned. During the final meeting, participants returned the ESM assessment forms/palm pilots to the researcher, and received reimbursement for their participation.

3.3.2 *Measures*

3.3.2.1 *Positive and Negative Syndrome Scale (PANSS; Kay et al., 1987)*

The presence and severity of positive and negative psychotic symptoms as well as general psychopathology were assessed in the clinical group using the 30-item PANSS semi-structured clinical interview, with a reference period of a week. Items were scored on 7-point Likert scales ranging from 1 (absent) to 7 (extreme). The three subscales have good reliability and validity (Kay, Opler, & Lindenmayer, 1988).

3.3.2.2 *Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991)*

Trait attachment was assessed using 4 short paragraphs describing prototypical attachment styles: secure, preoccupied, dismissing, and fearful. Participants were asked to select one attachment style that best describes them, and then rate each style on a 7-point Likert scale. For the purpose of this study a binary secure vs. insecure attachment variable was created. The insecure category comprises of those who self-identified as preoccupied, dismissing, and fearful.

3.3.2.3 *ESM Paranoia*

State paranoia was defined as a mean score of two statements that were rated on 7-point Likert scales. The statements assessed suspiciousness and paranoid

ideation: “Right now I worry that others are plotting against me”, “I believe that some people want to hurt me deliberately”, (Cronbach’s $\alpha = 0.89$), and were derived from the Persecution and Deservedness Scale (Melo et al., 2009), and have been used in previous ESM studies (Udachina, Varese, Bentall, Oorschot, & Myin-Germeys, 2012; Varese et al., 2011).

3.3.2.4 *ESM Auditory Hallucinations*

State auditory hallucinations were assessed using one item “Right now I hear voices that other people can’t hear”. This item assessed the presence and intensity of auditory hallucinations, and has been used in a previous ESM study (Varese et al., 2011). A voices present or absent variable was created as scores on the auditory hallucination variable were bimodal. Previous research has similarly found that auditory hallucinations are ‘on/off’ phenomena rather than experiences that increase and decrease continuously like paranoia (Oorschot et al., 2012).

3.3.2.5 *ESM Attachment Insecurity*

State attachment insecurity was defined as a mean score of six statements that were rated on 7-point Likert scales. The statements assessed feelings about the self and others: “I have found it difficult to depend on others”, “I have found myself wanting to maintain a distance from others”, “I have found it difficult to trust others completely”, “The thought that others might leave me was constantly on my mind”, “I am not worthy of other’s attention and affection”, “I worry that others don’t really want to be close to me” (Cronbach’s $\alpha = 0.89$). The statements were adapted from the Adult Attachment Style (AAS) questionnaire (Collins & Read, 1990). A two-factor model using Confirmatory Factor Analysis was not supported; Principal

Component Analysis (PCA) identified 1 factor (eigenvalue > 1), explaining 64% of the variability.

3.3.2.6 ESM Self-esteem

State self-esteem was assessed using four statements that were rated on 7-point Likert scales. PCA identified one factor (eigenvalue > 1), explaining 55% of the variability. State self-esteem was defined as the mean score of four items: “I am ashamed of myself” [reverse scored], “I am a failure” [reverse scored], “I like myself”, and “I am a good person”, (Cronbach’s $\alpha = 0.72$). These statements have previously been used in ESM studies (Thewissen et al., 2008; Thewissen et al., 2011; Udachina et al., 2012).

3.4 Analyses

3.4.1 Statistical Analyses

ESM data have a hierarchical structure, in which longitudinal observations are clustered within individuals. The data are ideally suited to explore the dynamic within-subject temporal associations between attachment and paranoia using multilevel linear regression modelling. Multilevel regression models are an extension of the more common unilevel linear regression methods (Hox, 1998). The effect sizes are represented by standardised regression coefficients (β) for multilevel models with continuous outcomes, and by odds-ratios (OR) for multilevel models with binary outcomes. The multilevel regression models were analysed in STATA 10 (StataCorp, 2007), and estimated using the STATA XTREG module for models with continuous outcomes, and the STATA XTGEE module for binary outcomes. In the analyses of attachment and self-esteem, time points across days (i.e. the first assessment completed by participants on each day) were excluded as they are

regarded not to measure momentary fluctuations. In the case of missing assessments, non-consecutive assessments were used in analyses.

Multilevel regression models were estimated to explore between-group differences on ESM measures of paranoia, auditory hallucinations, attachment insecurity, and attachment fluctuations. Multilevel regression analyses were also used to validate the ESM measure of attachment insecurity against the binary RQ measure of attachment. Finally, longitudinal multilevel models were estimated only on the clinical group to explore the primary hypotheses of this study: 1) whether elevated attachment insecurity led to a subsequent increase in paranoia (i.e. at subsequent assessment points) when controlling for auditory hallucinations (and vice versa to test for specificity of this effect), and 2) to determine whether the effect of attachment insecurity on paranoia survived after self-esteem was controlled for.

3.5 Results

3.5.1 Validating ESM attachment insecurity measure

To validate ESM attachment against the RQ (scored as secure or insecure), a multilevel linear regression analysis was carried out with the ESM attachment score as the dependent variable and the binary RQ variable as the independent variable. The insecure group reported significantly higher ESM attachment insecurity scores ($M = 2.271$, $SD = 1.158$), compared to the secure group ($M = 1.265$, $SD = 0.757$), ($\beta = 0.906$, $SE = .288$, $p = .002$, 95% CI [.342 - 1.470]). The mean value represents the average score across all observations.

3.5.2 Associations between ESM attachment insecurity and RQ attachment styles

(Table 3.2)

To explore the associations between ESM attachment insecurity and the Likert ratings of the individual RQ attachment styles a Pearson’s correlation was carried out. Findings revealed a strong negative association between ESM attachment insecurity and secure RQ attachment ($r = -.42$), and a strong positive association with fearful RQ attachment ($r = .54$). Although significant associations were found between ESM attachment insecurity and dismissive ($r = .18$) and preoccupied ($r = .14$) attachment these associations were modest (all $ps < .001$).

Table 3.2

Pearson correlations between RQ attachment styles and ESM attachment insecurity.

	1	2	3	4	5
1 Preoccupied RQ	-				
2 Dismissive RQ	-0.12***	-			
3 Fearful RQ	0.19***	-0.12***	-		
4 Secure RQ	-0.28***	-0.16***	-0.57***	-	
5 ESM attachment insecurity	0.14***	0.18***	0.54***	-0.42***	-

Note: *** $p < 0.001$

3.5.3 Between-group differences on the ESM measure

To test for between-group differences on the ESM measures, several multilevel models were estimated with ‘group’ (0 = control, 1 = clinical) as a predictor of ESM paranoia, attachment insecurity, and auditory hallucinations. The clinical group reported a higher mean level of paranoia ($M = 2.981$, $SD = 1.908$) compared to the control group ($M = 1.086$, $SD = 0.236$), ($\beta = 1.147$, $SE = .253$, $p < .001$, 95% CI [0.650 - 1.643]); a higher mean level of attachment insecurity ($M = 2.554$, $SD = 1.244$) compared to the control group ($M = 1.183$, $SD = 0.227$), ($\beta = 1.235$, $SE = .247$, $p < .001$, 95% CI [0.751 - 1.718]); and a higher mean level of

auditory hallucinations ($M = 0.463$, $SD = 0.427$) compared to the control group ($M = 0.007$, $SD = 0.026$), ($OR = 126.890$, $SE = 190.898$, $p = .001$, 95% CI [6.651 – 2421.036]).

3.5.4 *Between-group differences on attachment fluctuations*

To explore whether groups differed on fluctuations in attachment insecurity, a multilevel linear regression was carried out using the absolute change values as the dependent variable and group membership as the independent variable. The absolute change values were calculated by taking the absolute difference between the ESM attachment scores between assessment points (this gives higher values when there are larger differences between the scores between two time points but ignores the direction of change which is appropriate when conducting group comparisons of the magnitude of fluctuations). A greater degree of fluctuations in attachment insecurity was found in the clinical group ($M = 0.516$, $SD = 0.338$), than in the control group ($M = 0.187$, $SD = 0.196$), ($\beta = 0.560$, $SE = .140$, $p < .001$, 95% CI [.286 - .834]). An illustration of attachment fluctuations is presented in Figure 3.1.

3.5.5 *Does attachment insecurity predict paranoia?*

To test whether attachment insecurity predicted the occurrence of paranoia, a multilevel linear regression model was estimated with paranoia as the dependent variable, and attachment insecurity and paranoia (both measured at the previous assessment point) as the independent variables. The results revealed that an increase in paranoia was predicted by a preceding elevated level of attachment insecurity ($\beta = 0.173$, $SE = .041$, $p < .001$, 95% CI [.092 - .253]). This effect remained significant after controlling for concurrent auditory hallucinations ($\beta = 0.139$, $SE = .042$, $p = .001$, 95% CI [0.057 - .221]).

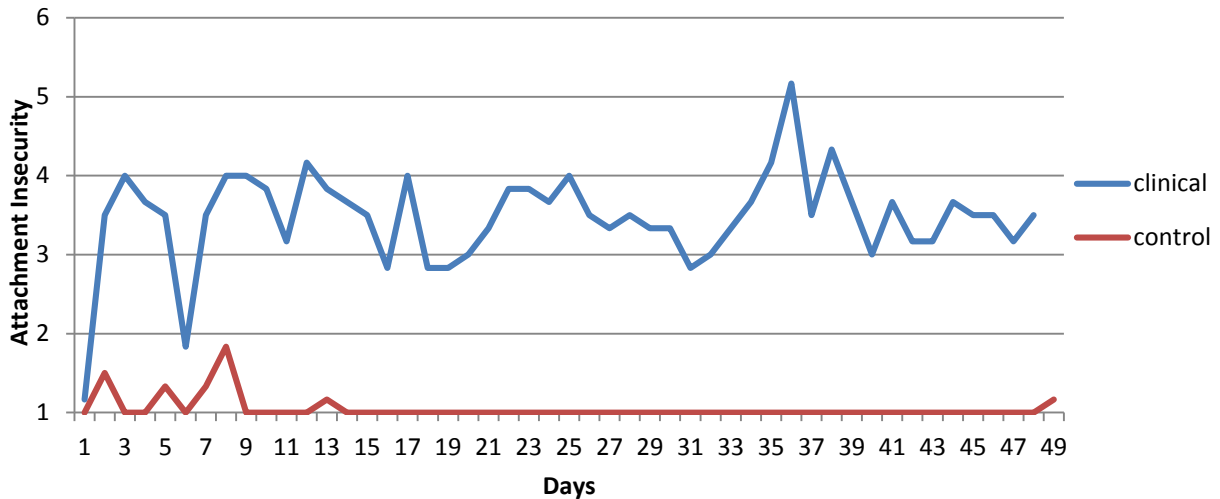


Figure 3.1

Illustration of attachment fluctuations between one clinical and one control participant.

3.5.6 Does attachment insecurity predict paranoia while controlling for self-esteem?

To determine whether attachment insecurity continued to predict the occurrence of paranoia in the presence of self-esteem and concurrent auditory hallucinations, a multilevel linear regression model was estimated with paranoia as the dependent variable, and attachment, paranoia and self-esteem (all at the previous assessment point) as the independent variables. The results revealed that the occurrence of paranoia continued to be followed by elevated attachment insecurity ($\beta = 0.140, SE = .042, p = .001, 95\% CI [.058 - .223]$), and not by self-esteem, ($\beta = 0.010, SE = .042, p > .05, 95\% CI [-.073 - .092]$).

3.5.7 Does attachment insecurity predict auditory hallucinations?

As a final test of the specificity of the relationship between attachment insecurity and paranoia, a multilevel linear regression model was estimated with

auditory hallucinations as the dependent variable, and attachment insecurity and auditory hallucinations (both measured at the previous assessment point) as the independent variables. The results revealed that the presence of auditory hallucinations was predicted by a preceding elevated level of attachment insecurity (OR = 1.285, $SE = .145$, $p < .05$, 95% CI [1.030 - 1.603]). This effect was no longer significant after controlling for concurrent paranoia (OR = 1.210, $SE = .138$, $p > .05$, 95% CI [.967 - 1.513]).

3.6 Discussion

In this study we sought to measure momentary attachment using experience sampling, and to examine the relationship between these representations and paranoid thoughts in the context of daily life of individuals with psychosis. The main finding was that elevated attachment insecurity was followed by increases in paranoid thinking, even when self-esteem was controlled for, and that this effect was specific to paranoia but not to hallucinations.

The strong negative association between mean momentary attachment insecurity measured by ESM and the secure attachment ratings on the RQ suggest that the ESM assessments had some validity. The validity of the ESM ratings was also supported by the fact that those participants who self-described as insecure on the prototypical RQ styles also showed less secure attachment on the ESM ratings than the self-described securely attached participants. However, there were at best modest associations between the momentary ESM attachment measures and the preoccupied and dismissive attachment ratings on the RQ. Hence, the ESM measure appears to be a relatively non-specific indicator of attachment insecurity.

As noted in the introduction, attachment theorists from Bowlby onwards have suggested that attachment behaviours and internal working models may fluctuate over even short periods, as internal working models become activated by context. It has been proposed that these fluctuations can be driven by tentatively held beliefs about the self and others (Davila et al., 1997). Thus, those who fluctuate may be highly uncertain about their attachment-related thoughts and feelings, for example about the extent to which they can depend and trust others and the extent to which they can become emotionally close to others. In contrast, those who do not fluctuate are considered more likely to hold higher levels of certainty (Davila et al., 1997). These fluctuations may have been responsible for the modest correlations observed between the ESM attachment insecurity ratings and the preoccupied and dismissive attachment ratings on the RQ, which shows to be highly associated with fearful attachment ratings on the RQ.

Our results also indicate that some people may fluctuate more than others in their attachment representations. We observed that the clinical group not only reported higher levels of higher attachment insecurity, but also a higher degree of attachment fluctuations than the control group, suggesting that these individuals, who have a psychosis-spectrum diagnosis may have incoherent internal working models. Davila and colleagues (1997) propose that attachment instability may develop as a result of dysfunctional early care-giving environments that disrupt the development of coherent self and other models and manifest in unstable adulthood attachment. It has consistently been reported that psychosis is associated with a wide range of early adverse experiences (Varese et al., 2012). Some of these experiences of parental separation (Agid et al., 1999) neglect (Bentall, Wickham, Shevlin, & Varese, 2012; Sitko, Bentall, Shevlin, O'Sullivan, & Sellwood, 2014) victimisation through means

of sexual abuse (Read, van Os, Morrison, & Ross, 2005), and of being unwanted at birth (Myhrman, Rantakallio, Isohanni, Jones, & Partanen, 1996) may result in disruptions to the development of early secure attachment relationships, and may subsequently lead to the development of incoherent self/others beliefs that fluctuate over time.

Although a number of studies have suggested that insecure attachment can increase vulnerability to developing psychosis (Read & Gumley, 2008), there is a paucity of research exploring the extent to which attachment insecurities are associated with the onset of psychotic symptoms in the flow of daily life. Our findings revealed that the occurrence of paranoid thoughts was preceded by elevated attachment insecurity, suggesting that, in everyday life, attachment representations may be responsible for maintaining paranoid experiences. It has been proposed however, that low self-esteem is common in individuals with paranoia (Bentall, Corcoran, Howard, Blackwood, & Kinderman, 2001; Garety & Freeman, 1999), and it could therefore be argued that self-esteem may also be a maintaining factor in paranoia, especially since experience sampling studies have demonstrated that low self-esteem precedes the occurrence of paranoid thinking (Thewissen et al., 2008; Thewissen et al., 2011). Our findings revealed that when self-esteem was controlled for, attachment insecurity continued to precede paranoid thinking, suggesting that attachment representations may play a more important role in understanding paranoid experiences.

Our findings further indicate the specificity of this effect by demonstrating that there was no relationship between attachment insecurity and auditory hallucinations once paranoia had been controlled for. This kind of specificity is important as it points to the psychological mechanisms that are involved in

experiencing specific symptoms. In a separate ESM study, for example, the experience of auditory hallucinations was shown to be specifically associated with dissociative experiences, and elevated levels of dissociation led to a subsequent increase in hallucinatory experiences but not paranoid thinking (Varese et al., 2011). Mapping these pathways may be extremely useful in clinical practice where appropriate psychological mechanisms can be targeted during therapeutic interventions.

The findings should be interpreted in the context of several limitations. First, some participants used paper methods of data collection whereas others used an electronic method. Although it might be thought that the traditional paper diary method would be associated with poor compliance, it has been demonstrated that compliance rates are similar for both paper diary methods and electronic diary methods (Green et al., 2006). Second, the sample size might be criticized as being relatively small (20 per group), and further larger studies are needed to confirm our findings. Third, an affective pathway to psychosis has previously been proposed (ex. Myin-Germeys & van Os, 2007), and future studies should control for the effect of depression on paranoia. Fourth, although our findings show that attachment appraisals do not affect frequency of auditory hallucinations, it has recently been proposed that there may be a link between attachment representations and appraisals of auditory hallucinations (Berry & Bucci, 2016). Fifth, although it has been proposed that different affect regulation strategies may be employed by individuals with differing attachment styles, we are not able to examine each attachment style in an ESM framework. However, it is important to note that our ESM measure was validated against the RQ, and showed to be highly associated with the fearful (disorganised) ratings on the RQ. Finally, although the ESM method is longitudinal,

it is important to be cautious about making inferences of causality from the data; it is possible that elevated levels of paranoia may also trigger changes in attachment representations, and this needs to be explored in future research.

To our knowledge, this is the first study exploring the temporal relationship between momentary attachment insecurity and symptoms of psychosis. There are several important clinical and theoretical implications. The findings demonstrate that attachment can fluctuate over very short periods of time, and that fluctuations in attachment representations appear to be more pronounced in individuals with psychosis compared to healthy controls. Therefore, to obtain a greater understanding of one's attachment representations, in addition to assessing attachment security, it may be informative to assess the level of attachment stability. Since experience sampling can be quite a laborious process for participants, the development of a quicker and easier to administer measure of attachment fluctuations may be preferable for clinical purposes. The findings suggest that secure attachment may be associated with a lower risk of paranoia. This observation has the implication that, in therapeutic work, therapists should focus their interventions on addressing attachment beliefs, and work towards establishing a sense of attachment security. Finally, in concert with previous epidemiological and cross-sectional studies that show an association between attachment insecurity and paranoia (Pickering et al., 2008; Wickham et al., 2015) the present findings suggest that policies that promote optimal relationships with caregivers in childhood may help to promote population mental health.

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Chapter 4

Dissociation moderates the association between attachment and paranoia.⁵

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4.1 Abstract

Considerable evidence has shown that specific psychotic symptoms may be associated with specific psychological mechanisms. Insecure attachment has been proposed to be associated with paranoia, while dissociation has been suggested to be associated with hallucinations. As it is the norm for individuals with psychosis to experience multiple symptoms, this study addresses how these mechanisms interact in their effect on paranoia. 80 individuals with psychosis-spectrum diagnoses were recruited from inpatient and community teams. The findings revealed that the anxious and avoidant attachment dimensions, and dissociation were specifically associated with paranoia, and that dissociation moderated the effect of the anxious attachment dimension but not the avoidant attachment dimension on paranoia. These findings suggest that examining dissociation in individuals who experience paranoia may be informative, and that examining how psychological processes interact in their effect on symptoms may be important in understanding individuals who experience multiple psychotic symptoms. Finally this study shows that within the context of relationships, dissociation may be a response to events which threaten the self, suggesting that when working therapeutically, therapists should be aware that the dissociative process may be part of the defence mechanism protecting negative appraisals of the self.

4.2 Introduction

In recent years, considerable evidence has emerged that childhood trauma is a major risk factor for psychosis in adulthood, with consistent findings across multiple research designs and a dose-response relationship between severity of trauma and risk (Varese et al., 2012). Some studies (Bentall, Wickham, Shevlin, & Varese, 2012; Sitko, Bentall, Shevlin, O'Sullivan, & Sellwood, 2014) but not all (van Nierop et al., 2014) have reported some specificity in the associations between types of childhood adversity and symptoms, with parental neglect and being raised in institutional care most toxic for paranoid symptoms and childhood sexual abuse most toxic for hallucinations. These observations have led some researchers to focus on two specific psychological mechanisms that may be related to these risk factors: dissociation and insecure attachment. A complication, which we address in this study, is that these processes may interact.

4.2.1 *Dissociation and Psychosis*

Dissociation is characterised by experiences of depersonalisation, imaginative absorption, and dissociative amnesia (Bernstein & Putnam, 1986). Depersonalisation involves detachment from the self and accompanying feelings of unreality (Ogawa, Sroufe, Weinfield, Carlson, & Egeland, 1997; Waller, Putnam, & Carlson, 1996), while imaginative absorption involves high levels of self-focused attention so that individuals are often unaware of the events occurring around them and are impermeable to distraction (Tellegen & Atkinson, 1974). Individuals who experience amnesia find that they have no recollection of doing things that they have done, for example finding themselves in a place whilst not having any memory of how they got there (Waller et al., 1996).

Dissociation is often a reaction to traumatic experiences (Braehler et al., 2013; Chu & Dill, 1990; Dalenberg et al., 2012; Goren, Phillips, Chapman, & Salo, 2012; Nijman et al., 1999; Ogawa et al., 1997; Sandberg & Lynn, 1992). It seems to act as a defensive process on exposure to overwhelming and inescapable events, which abates both physical and psychological distress (Briere, Scott, & Weathers, 2005; Spiegel & Cardeña, 1991). Although dissociation is thought to function as a coping strategy, the painful un-processed emotions and memories are believed to remain disconnected from the executive-self (van der Hart, Nijenhuis, & Steele, 2006) and therefore unintegrated into consciousness and memory (Bernstein & Putnam, 1986).

Dissociative experiences have been shown to be highly associated with symptoms of psychosis (Goren et al., 2012; Spitzer, Barnow, Freyberger, & Grabe, 2007). It has been suggested that positive symptoms can be considered dissociative in nature, and consequently it has been questioned whether the two can be adequately distinguished (Moskowitz, Barker-Collo & Ellson, 2005). Ross and Keyes (2004) acknowledge this overlap but propose a trans-diagnostic perspective where psychosis and dissociation lie on a continuum which encompasses dissociative identity disorder, trauma induced dissociative psychosis, and non-dissociative psychosis. Still, others suggest that trauma-induced dissociative states may increase vulnerability to and risk of experiencing psychotic symptoms (Allen, Coyne, & Console, 1997).

Several studies have reported a specific association between auditory hallucinations and dissociation (Moskowitz & Corstens, 2008; Perona-Garcelan et al., 2014; Perona-Garcelán et al., 2012; Varese, Barkus, & Bentall, 2012). In an experience sampling study it was observed that elevated levels of dissociation

predicted the onset of subsequent auditory hallucinations even after controlling for co-occurring paranoia (Varese, Udachina, Myin-Germeys, Oorschot, & Bentall, 2011). This association has further been supported by a recent meta-analysis which reported a large and robust relationship between the two phenomena (Pilton, Varese, Berry, & Bucci, 2015). In contrast to these findings, however, a recent study by Černis et al. (2014) reported a strong association between depersonalisation and paranoia.

4.2.2 *Attachment and Psychosis*

At the core of attachment theory are beliefs about the self and others which begin to develop in infancy through interactions with primary caregivers (Bowlby, 1973). Developing a secure attachment style is considered the most optimal, as it is associated with sensitive and emotionally available parenting which fosters the development of positive beliefs about the self and others. The development of an insecure attachment is associated with emotionally unavailable, unresponsive and/or inconsistent parenting, and results in the development of an anxious (negative view of self, positive view of others) or an avoidant attachment style (positive view of self, negative view of others) (Main & Solomon, 1990). However, when confusing and contradictory parenting is exhibited, often through frightening and frightened responses, disorganised attachment, characterised by negative views about the self and others, may be especially likely to develop (Main & Solomon, 1990).

Adult attachment theory proposes that beliefs that develop from these early emotional bonds may guide expectations in future adult attachment-related interactions (Bartholomew & Horowitz, 1991). Adult attachment can therefore be explored in terms of attachment styles: secure, preoccupied (anxious), dismissing

(avoidant), and fearful (disorganised). However, characteristics from these styles can be captured in two disparate dimensions, the anxious dimension (model of self) and the avoidant dimension (model of others). Low scores on both dimensions are characteristic of secure attachment, high scores on both dimensions are characteristic of fearful attachment, while high scores only on the avoidant dimension are characteristic of a dismissing style, and finally high scores only on the anxious dimension are characteristic of a preoccupied style (Ravitz, Maunder, Hunter, Sthankiya, & Lancee, 2010).

It has been proposed that insecure attachment can increase the risk of developing psychosis (Read & Gumley, 2008), and can have negative effects on its course (Berry, Barrowclough, & Wearden, 2007a). Insecure attachment has been shown to be associated with psychosis in non-clinical (Berry, Band, Corcoran, Barrowclough, & Wearden, 2007b; Berry, Wearden, Barrowclough, & Liversidge, 2006) and in clinical samples (Berry et al., 2007a; Korver-Nieberg, Meijer, de Haan, Berry, & Ponizovsky, 2015). More recently however it has been proposed that paranoid beliefs (persecutory delusions) can be understood within an attachment framework (Bentall, Corcoran, Howard, Blackwood, & Kinderman, 2001; Bentall & Fernyhough, 2008) and both clinical and sub-clinical studies have shown that paranoia is associated with insecure attachment (Berry, Barrowclough, & Wearden, 2008; Cooper, Shaver, & Collins, 1998; Mickelson, Kessler, & Shaver, 1997) but not hallucinations (Pickering, Simpson, & Bentall, 2008; Wickham, Sitko, & Bentall, 2015). In a recent experience sampling study paranoid beliefs were preceded by elevated levels of insecure attachment-related thoughts but this was not observed for auditory hallucinations (Sitko et al., under review).

4.2.3 Purpose of the Present Study

Although it has been argued that insecure attachment and dissociation map onto specific symptom-related pathways to psychotic illness, it has yet to be explored how these two phenomena interact in individuals with psychosis. This might be expected to be especially important in the case of paranoia, given that insecure attachment is known to be important in beliefs about persecution, and given the recent finding that depersonalisation and paranoia are associated (Černis et al., 2014). Outside the field of psychosis, it has been proposed that individuals who develop disorganised attachment in childhood are more prone to dissociate to trauma in later life (Liotti, 2004; Liotti 2006; Lyons-Ruth, 2003), suggesting a complex interaction between the two processes. Liotti (2004) has even proposed that disorganised attachment is essentially a form of dissociation. We were therefore interested in examining whether dissociation interacts with insecure attachment and how they jointly effect paranoia, and whether any association between the two mechanisms relates to the anxious or the avoidant attachment dimensions.

The overall goal of the study was to use the dimensional models of the self and others as a framework for examining potential interactions between dissociation and psychotic symptoms. The first aim of the study was to explore whether anxious and avoidant attachment dimensions and dissociation predict paranoid and hallucinatory symptoms. We hypothesised that both the anxious and avoidant attachment dimensions would predict paranoia, while dissociation would predict hallucinations. The second aim of the study was to explore whether dissociation moderated the relationship between the anxious and avoidant attachment dimensions and paranoia. We hypothesised that higher levels of dissociation would be associated with higher levels of inhibiting emotional processing, and in a reduced awareness of

negative internal models of the self and others, and therefore less evident insecure attachment.

4.3 Method

4.3.1 Participants and Procedure

Eighty participants with schizophrenia spectrum diagnoses (schizophrenia, paranoid schizophrenia, schizoaffective, and non-specified nonorganic psychosis) were recruited from inpatient and outpatient services in North West England, UK. The study was approved by a National Health Service (NHS) research ethics committee. All participants were referred to the study by a professional involved in their care, where they were provided with the study details and given up to a week to decide if they want to take part. All participants were between the ages of 18-65, and provided informed consent. Demographic and clinical information is shown in Table 4.1. Participants were excluded if they lacked proficiency in the English language. Participants were interviewed at a convenient place, usually in their homes, on an average of two occasions (measures not included in this report were also administered).

4.3.2 Measures

4.3.2.1 Positive and Negative Syndrome Scale (PANSS; Kay, Fiszbein, & Opfer, 1987)

The Positive and Negative Syndrome Scale is a 30-item semi-structured clinical interview developed to assess the presence and severity of general psychopathology as well as positive and negative psychotic symptoms with a reference period of a week. Items were scored on 7-point Likert scales ranging from

1 (absent) to 7 (extreme). The three subscales have good reliability and validity (Kay, Opler, & Lindenmayer, 1988). The P6 suspiciousness/persecution (referred to as paranoia) and P3 hallucinatory behaviour items from this measure were used in the analyses.

4.3.2.2 The Dissociative Experiences Scale II (DES-II; Bernstein-Carlson & Putnam, 1993)

The Dissociative Experiences Scale II is a 28-item self-report measure developed to assess the frequency of dissociative experiences. Each item was scored using a 0% (never) to 100% (always) scale, with 10% increments, reflecting the degree to which the experience described applied. The overall score represents the summation of all items representing absorption and imaginative involvement, amnesic dissociation, and depersonalisation/derealisation (Bernstein-Carlson & Putnam, 1993). The scale has good internal consistency and construct validity (Bernstein-Carlson & Putnam, 1993). Item 27 was removed from the analysis as it assesses voice hearing and may therefore lead to a spurious association with the PANSS hallucinations item.

4.3.2.3 Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991)

The Relationship Questionnaire was developed to assess adulthood attachment using 4 short paragraphs describing secure, preoccupied, dismissing, and fearful attachment styles. Participants were asked to rate each style on a 7-point Likert scale, and the ratings were used to calculate anxious ((fearful + preoccupied) – (secure + dismissing)) and avoidant ((fearful + dismissing) – (secure + preoccupied)) attachment dimensions. Higher scores on the anxious dimension reflect a higher

negative view of the self, while higher scores on the avoidant dimension reflect a higher negative view of others.

Table 4.1

Demographic and clinical information based on means and standard deviations.

	Clinical (n=80)
Age	41.51 (12.59)
Sex	20 female; 60 male
Positive Symptoms	2.28 (1.61)
Suspiciousness/Persecution (P6)	3.83 (1.51)
Hallucinatory Behaviour (P3)	2.68 (1.72)
Negative Symptoms	1.84 (1.25)
General Psychopathology	2.03 (1.46)
Diagnosis	Schizophrenia = 35 Psychosis NOS = 20 Schizoaffective = 5 Paranoid Schizophrenia = 20

Note: NOS = not otherwise specified

4.4 Results

4.4.1 Statistical Analyses

All analyses were conducted in SPSS v 22. Pearson correlations were calculated to explore the first order associations between paranoia, hallucinations, dissociation and the attachment dimensions. Linear regressions were carried out to explore whether a) the avoidant and anxious attachment dimensions predict paranoia; b) the avoidant and anxious attachment dimensions predict hallucinations; c)

dissociation predicts paranoia; and d) dissociation predicts hallucinations. Finally, to explore whether dissociation moderates the association between the attachment dimensions and paranoia, two separate models were specified using the PROCESS macro add-on, with paranoia as the outcome, dissociation as the moderator, and anxious attachment dimension as the predictor in the first model, and avoidant attachment dimension as the predictor in the second model. Conditional effects were also calculated to probe for interactions. This approach allows us to ascertain whether the independent variable (attachment dimension) is related to the dependent variable at low (-1 SD from mean), medium (mean), and high (+1 SD from mean) levels of the moderator (dissociation; Hayes, 2013). Since research suggests that comorbid symptoms might confound predictors (Pickering et al., 2008), paranoia and hallucinations were controlled for appropriately. The attachment dimensions were also appropriately controlled for.

4.4.2 Correlation Analysis

Paranoia and hallucinations were not associated ($r = .020, p = .860$). The anxious attachment dimension on the RQ did not correlate significantly with the avoidant attachment dimension ($r = .204, p = .076$). However, the anxious attachment dimension correlated with dissociation ($r = .280, p = .014$), whereas no association with dissociation was observed for the avoidant attachment dimension ($r = .172, p = .137$).

Paranoia was associated with the avoidant ($r = .404, p < .001$) and anxious ($r = .293, p = .01$) attachment dimensions, but similar associations were not found with hallucinations ($r = .072, p = .538$; $r = .166, p = .151$, respectively). Significant associations were also found between dissociation and paranoia ($r = .309, p = .005$),

but, contrary to expectation, not between dissociation and hallucinations ($r = .193, p = .086$).

4.4.3 Regression Analyses

To examine whether the attachment dimensions predict paranoia, a two stage hierarchical regression analysis was conducted with paranoia as the dependent variable. Hallucinations were entered at stage one to control for hallucinatory experiences, and the anxious and avoidant attachment dimensions were entered at stage two. At stage one, hallucinations did not significantly contribute to the regression model, ($F(1,74) = 0.023, p = .879$). The anxious and avoidant attachment dimensions added at stage two significantly contributed to the regression model, ($F(3,72) = 6.620, p = .001$), explaining 21.6% of the variance, so that both significantly predicted paranoia ($\beta = .233, SE = .043, p = .034$; $\beta = .362, SE = .039, p = .001$, respectively). A similar model, controlling for paranoia, was estimated to examine the effect of the attachment dimensions on hallucinations. However, the final model was not significant ($F(3,72) = 0.929, p = .431$).

To test whether dissociation predicted hallucinations, a two stage hierarchical regression analysis was conducted with hallucinations as the dependent variable. Paranoia was entered at stage one to control for paranoid experiences, and dissociation was entered at stage two. At stage two dissociation did not significantly contribute to the regression model ($F(2,77) = 1.567, p = .215$). Finally, to test whether dissociation predicted paranoia, a similar model was estimated with paranoia as the dependent variable and hallucinations entered at stage one. At stage two dissociation significantly contributed to the regression model ($F(2,77) = 4.153, p =$

.019), accounted for 9.7% of the variation and significantly predicted paranoia ($\beta = .317, SE = .010, p = .005$).

4.4.4 Moderation Models (Table 4.2 and Table 4.3)

Two moderation models were estimated. In the first we considered whether dissociation affected the association between the anxious attachment dimension and paranoia, while controlling for hallucinations and the avoidant attachment dimension. The overall model was significant ($F(5,70) = 7.458, p < .001$), and accounted for 34.8% of the variance in paranoia. The moderation effect was also significant ($t(70) = -3.204, p = .002$), and an additional 9.57% of variation in paranoia was explained by introducing the interaction between the anxious attachment dimension and dissociation ($F(1,70) = 10.266, p = .002$).

The conditional effects further demonstrated that at low levels of dissociation, the effect of the anxious attachment dimension on paranoia remained ($\theta_{\chi \rightarrow y|M=8.14} = 0.187, t(70) = 3.465, p < .001$) but, at medium and high levels of dissociation, the effect of the anxious attachment dimension on paranoia decreased and became non-significant ($\theta_{\chi \rightarrow y|M=24.21} = 0.062, t(70) = 1.506, p = .137$; $\theta_{\chi \rightarrow y|M=40.27} = -0.064, t(70) = -1.080, p = .284$, respectively).

The second moderation model considered the avoidant attachment dimension. Although the overall model was significant ($F(5,70) = 4.714, p < .001$), and accounted for 25.2% of the variance in paranoia, adding the moderator did not significantly improve the model ($F(1,70) = 0.0005, p = .981$), and accounted for no increase in the variation in paranoia. Hence, the effect of avoidant attachment on paranoia was unaffected by dissociation.

Table 4.2

Regression analysis examining the moderated effect of dissociation on the association between the anxious attachment dimension and paranoia, while controlling for hallucinations, and the avoidant attachment dimension.

		Coeff.	SE	t	p
Intercept	i_1	3.332	0.344	9.698	< .001
Anxious Attachment Dimension (X)	b_1	0.251	0.069	2.091	< .001
Dissociation (M)	b_2	0.020	0.010	3.651	.040
Anxious Attachment Dimension x Dissociation (XM)	b_3	-0.008	0.002	-3.204	.002
Hallucinations (C_1)	b_4	-0.014	0.091	-0.155	.877
Avoidant Attachment Dimension (C_2)	b_5	0.113	0.036	3.126	.003
$R^2 = .348, MSE = 1.628$					
$F(5,70) = 7.458, p < .001$					

Note: SE = standard error

Table 4.3

Regression analysis examining the moderated effect of dissociation on the association between the avoidant attachment dimension and paranoia, while controlling for hallucinations, and the anxious attachment dimension.

		Coeff.	SE	t	p
Intercept	i_1	3.428	0.369	9.287	< .001
Avoidant Attachment Dimension (X)	b_1	0.121	0.011	1.768	.082
Dissociation (M)	b_2	0.019	0.076	1.590	.116
Avoidant Attachment Dimension x Dissociation (XM)	b_3	0.000	0.003	0.023	.981
Hallucinations (C_1)	b_4	-0.094	0.094	-0.987	.327
Anxious Attachment Dimension (C_2)	b_5	0.044	0.044	1.680	.097
$R^2 = .252, MSE = 1.866$					
$F(5,70) = 4.714, p < .001$					

Note: SE = standard error

4.5 Discussion

In this study we sought to explore whether attachment dimensions and dissociation map onto specific symptom-related pathways, and whether these two phenomena interact in their effect on paranoia. The main finding was that dissociation moderated the relationship between the anxious attachment dimension and paranoia, but not between the avoidant attachment dimension and paranoia.

The correlation analysis, supported by regression analyses, showed that hallucinations and paranoia did not correlate. This is an atypical finding, as correlations between hallucinations and paranoia is usually observed in patients with psychosis, but does not compromise our analyses or conclusions. Paranoia was associated with both the anxious and avoidant attachment dimensions but as expected, and as found in previous research (Pickering et al., 2008; Wickham et al., 2015) these dimensions did not correlate significantly with hallucinations.

To our surprise however dissociation rather than being associated with hallucinations as expected, and as reported in previous studies (Pilton et al., 2015) correlated with paranoia. Our hallucinatory behaviour PANSS item included auditory, visual, tactile, and olfactory hallucinations, raising the possibility that dissociation may not be associated with all types of hallucinatory experiences, and that this may have diminished any observable association between hallucinations and dissociation, which nonetheless approached significance ($p = .082$). As noted in the introduction, a previous study (Černis et al., 2014) has reported an association between dissociation and paranoia although this study specifically focused on depersonalisation. The current finding suggests that although the dissociation-

auditory hallucinations link has received much attention, dissociation in relation to paranoid beliefs merits further attention in future research.

The main aim of the study was to test the relationship between the anxious and avoidant attachment dimensions and paranoia in the presence of dissociation as a moderating variable. The findings revealed that dissociation moderated the effect of the anxious attachment dimension but not the avoidant dimension. We initially hypothesized that higher levels of dissociation would be associated with higher levels of inhibiting emotional processing, and a reduced awareness of one's view of the self in the context of a relationship. However, the positive association between dissociation and the anxious attachment dimension, and the conditional effects point to an alternative explanation. The conditional effects demonstrated that at low levels of dissociation the relationship between the anxious attachment dimension and paranoia was evident. However at medium and high levels of dissociation, this association did not exist. A plausible explanation for this finding is that dissociation functions as a defence mechanism following a negative appraisal of the self. Dissociation is believed to begin as a protective mechanism which aims to maintain integrity of the self in the face of traumatic experiences (Ogawa et al., 1997). The process however can become a more generalised routine response to daily stressors or threats, and Ogawa and colleagues (1997) suggest that individuals may use dissociation as a defence mechanism against feelings of worthlessness. Our findings similarly suggest that within the context of relationships, dissociation may be a response to events which threaten the self. The absence of an interaction between dissociation and the avoidant attachment dimension supports this hypothesis. Although Liotti (2006) theorised that disorganised attachment (negative views of self

and others) is dissociative in nature, our findings suggest that in the context of psychosis, negative beliefs about the self may be the critical factor.

There are certain limitations to the study that should be considered. The DES-II requires a response that is based on the experiences of the past 6 months, and participants could have erroneously reported their most recent experiences. The attachment scale relies on self-report data and it could be argued that individuals may limit their awareness of their sense of insecurity, especially the dismissing style (Read & Gumley, 2008). The data are cross-sectional and we cannot draw conclusions about the causality of the relationships.

4.5.1 Clinical Implications

There are some important clinical implications. First our findings suggest that, although dissociation has largely been researched in individuals who experience auditory hallucinations, examining dissociative experiences in individuals who experience paranoia might be informative. Second, although examining associations between specific psychological mechanisms and psychotic symptoms is extremely important, examining how these psychological mechanisms interact in their effect on symptoms may be just as important in understanding individuals who experience multiple psychotic symptoms, which is the norm in clinical groups. Finally in psychological therapy, therapists may choose to address attachment beliefs, and work towards reducing negative beliefs about the self and others, but should be aware that dissociative processes may be part of the defence mechanism protecting negative appraisals of the self.

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Chapter 5⁶

Discussion

⁶ Parts from this chapter have been used in a book chapter: Bentall, R. P. & Sitko, K. (in prep.). The specific role of insecure attachment in paranoid delusions. In K. Berry, S. Bucci, A. Danquah (Eds.). ISPS book series.

5.1 General Discussion

The three empirical studies included in this thesis address a number of important clinical and theoretical questions around the understanding of paranoia within an attachment theory framework. This section will attempt to summarise the findings and integrate them, discuss theoretical issues around measuring attachment, address over-arching study limitations, consider clinical and policy implications, and finally discuss future research directions.

The primary goal of the thesis was to investigate whether paranoia could be understood within an attachment theory framework. This was examined by: first assessing whether childhood adversities were associated with paranoia, and by further exploring whether these effects were mediated by insecure attachment; second, by assessing whether in the flow of daily life attachment representations fluctuated, whether elevated levels of insecure attachment predicted subsequent paranoia, and whether this association survived while controlling for self-esteem; third, by exploring whether the anxious and avoidant attachment dimensions were specifically associated with paranoia, and whether these dimensions interacted with dissociation in their effect on paranoia.

5.2 Specific findings

Chapter 2 described findings from a large epidemiological dataset, the National Comorbidity Survey, which consistent with the findings of Bentall, Wickham, Shevlin, and Varese (2012), found that childhood experiences of neglect were specifically associated with paranoia, while experiences of sexual molestation and rape were specifically associated with hallucinations. It was then explored whether these associations were mediated by attachment styles; measured as anxious,

avoidant, secure. It was revealed that the association between neglect and paranoia was fully mediated by both anxious and avoidant attachment, that anxious attachment partially mediated the relationship between rape and hallucinations, and that the relationship between sexual molestation and hallucinations was independent of attachment style. Several difficult to interpret indirect effects were found between rape and paranoia via anxious attachment, and between neglect and hallucinations via anxious and avoidant attachment. Since the relationship between childhood adverse experiences and psychotic symptoms has been proposed in the framework of an affective pathway (Myin-Germeys & van Os, 2007), the analysis was replicated with both depression and attachment styles as mediators. This analysis yielded similar results; however the relationship between rape and hallucinations was no longer mediated by insecure attachment. Since this investigation used cross-sectional data, the order of events could not be ascertained and it could be argued that insecure attachment developed prior to the occurrence of psychotic symptoms or that it developed as a consequence of psychotic symptoms.

In Chapter 3, which compared a clinical sample to a healthy control group, it was examined whether in the flow of daily life attachment representations fluctuated, and whether these fluctuations in attachment representations were meaningfully associated with fluctuations in paranoia. This was investigated through a longitudinal design which utilised the experience sampling method (ESM). The ESM is an intensive, fine-grained assessment which examines the flow of phenomena in everyday life. As the data is recorded in a temporal fashion, this method enabled the data to be examined using multilevel modelling to assess whether changes in attachment representations lead to the onset of psychotic symptoms. The findings demonstrated that, in comparison with the control sample, the clinical sample

fluctuated significantly more in their attachment representations. In addition, it was found that increased levels of paranoia were preceded by elevated levels of attachment insecurity; importantly, this effect was not observed for hallucinations. As low levels of self-esteem have also been shown to precede an increase in paranoia (Thewissen, Bentall, Lecomte, van Os, & Myin-Germeys, 2008; Thewissen et al., 2011), self-esteem was added to the model to examine its effect. It was found that, in this model, self-esteem did not predict subsequent paranoia, but that attachment insecurity continued to precede the increase of paranoia. Hence the effects of attachment insecurity seemed to overshadow the effects of self-esteem. Although it is important to examine the psychological mechanisms that are associated with specific symptoms of psychosis, it may also be important to explore how various psychological mechanisms interact in their effect on symptoms. This is especially important as it is the norm for individuals with psychosis to experience multiple symptoms.

Chapter 4 therefore examined, in a large patient sample, whether the two psychological mechanisms implicated in paranoia and hallucinations, insecure attachment and dissociation, interact in their effect on paranoia. The findings showed that the anxious and avoidant attachment dimensions and dissociation were associated with paranoia. Further analyses revealed that dissociation moderated the effect of the anxious attachment dimension but not the avoidant attachment dimension in their effect on paranoia. Conditional analyses indicated that at low levels of dissociation, the association between the anxious attachment dimension and paranoia existed, however at medium and high levels of dissociation, the association between the anxious attachment dimension and paranoia ceased to exist. The

findings also showed that dissociation did not moderate the association between the avoidant attachment dimension and paranoia.

5.3 Integrative summary

Research has consistently reported associations between insecure attachment and psychotic symptoms (e.g. Korver-Nieberg, Meijer, de Haan, Berry, & Ponizovsky, 2015). A complication with the majority of these studies is that co-occurring symptoms were not controlled for. Two studies which appropriately controlled for co-occurring symptoms demonstrated that the avoidant and anxious attachment dimensions were specifically associated with paranoia and not hallucinations (Pickering, Simpson, & Bentall, 2008; Wickham, Sitko, & Bentall, 2015). The studies of patients presented in Chapters 3 and 4 similarly demonstrated that attachment insecurity, and the avoidant and anxious attachment dimensions respectively, were specifically associated with paranoia and not hallucinations. The population study in Chapter 2 however, showed that both the avoidant and anxious attachment styles were associated with both paranoia and hallucinations. This observation may reflect differences between the population and patient samples. Although one previous non-clinical study showed a specific association between insecure attachment and paranoia after appropriately controlling for hallucinations (e.g. Pickering et al., 2008), there are no other population studies which use a similar statistical method that could be used to compare this finding with. This observation may also reflect measurement issues, as the studies used different measures of attachment; the study in Chapter 4 used Bartholomew and Horowitz's (1991) Relationship Questionnaire, the study in Chapter 3 adapted questions from the Adult Attachment Style (Collins & Read, 1990), and validated the questions against the Relationship Questionnaire, while the study in Chapter 2 used Hazan and Shaver's

(1987) Adult Attachment Questionnaire, which in comparison does not assess fearful attachment. Although it seems clear from these and previous findings that insecure attachment is specifically associated with paranoia, the relationship with hallucinations is less certain.

The link between insecure attachment and paranoia described above may not be direct. In past research, this link has been explained in terms of various psychological mechanisms such as negative self-esteem (Pickering et al., 2008; Wickham et al., 2015), the perception that others are powerful, and the anticipation of threat (Pickering et al., 2008). Gumley and Schwannauer (2006) have also proposed that the ability to successfully modulate affect could be used to understand this link. They suggested that an individual with a frightening and/or frightened attachment figure may develop limited strategies to modulate affect, and therefore may respond with deregulated and disorganised strategies, which may subsequently link to experiencing psychosis. It has also been suggested that increased sensitivity to criticism, and negative responses from others, could be a function of insecure attachment which may lead to psychotic symptoms (Berry, Band, Corcoran, Barrowclough, & Wearden, 2007). These cognitive and affective mechanisms could be used to understand the observed link between insecure attachment and paranoia.

Over the past decade research has consistently found that childhood traumatic experiences which occur within the family environment can play an important role in the development of psychosis (Varese et al., 2012a). The findings here support Laing's early arguments proposing that psychosis could be understood in terms of an individual's life experience, and replicate Bentall et al.'s (2012) specificity findings. Chapter 2 revealed that experiences of childhood neglect were associated with paranoia, and that this relationship could be understood from an attachment

perspective, supporting the view that the link between traumatic experiences and psychosis is not direct (e.g. Gumley & Schwannauer, 2006), as anxious and avoidant attachment fully mediated this relationship. Although in Chapter 2 it is suggested that experiences of neglect may have led to the development of insecure attachment by distorting attachment representations (Waters, Merrick, Treboux, Crowell, & Albersheim, 2000), this suggestion was justified theoretically and on the basis of previous research evidence, and there are obvious challenges in deriving such inferences from mediation analyses using cross-sectional data (Mathieu & Taylor, 2006). It can for example be also suggested that insecure attachment may have already been present, and that subsequent experiences of neglect led to the development of paranoia (e.g. Liotti & Gumley, 2008).

Although in Chapter 2 it has also been shown that sexual molestation and rape were associated with hallucinations, these pathways were independent of attachment style once depression was included as a mediator, suggesting that there may be other psychological mechanisms involved in these associations such as dissociation (Varese, Barkus, & Bentall, 2012; Varese, Udachina, Myin-Germeys, Oorschot, & Bentall, 2011). Within the context of betrayal trauma theory (Freyd, 2008) for example, it is suggested that, in childhood, betrayal of trust can produce a conflict between external reality (ex. sexual abuse) and the necessary system of social dependence. If a child processes a betrayal in the 'normal' way, he or she would be motivated to withdraw from the betrayer. However if the betrayer is for example a primary caregiver, withdrawing from a person on whom the child depends would further threaten the child's security (physically and mentally). Instead, it may be in the child's best interest to ignore the betrayal and behave in a way that will not threaten attachment. Thus, the trauma of child abuse could require that information

about the abuse be blocked from mental mechanisms that control attachment and attachment behaviour.

It is not argued that a perfect fit would always be expected between unpleasant childhood experiences, psychological mechanisms, and psychotic symptoms. There may be other important factors that affect these associations, such as the response of the caregiver or, as mentioned above, who the perpetrator was. This may in part explain some of the difficult to interpret indirect effects observed in Chapter 2 between rape and paranoia via anxious attachment, and between neglect and hallucinations via anxious and avoidant attachment.

Although there were challenges in deriving inferences whether insecure attachment led to subsequent paranoia using the cross-sectional approach, the longitudinal approach in Chapter 3 brought more confidence to this theoretically driven hypothesis. Berry, Barrowclough, and Wearden (2008) proposed that psychotic symptoms, especially paranoia, may be maintained through attachment representations. Using a more fine-grained approach which examined the temporal order of events in the flow of daily life, it was found that elevated levels of attachment insecurity led to a subsequent increase in paranoia. This effect was not observed with hallucinations, suggesting that the activation of insecure attachment schemas may specifically trigger paranoid experiences. Although this finding is based on longitudinal data, it is important to be cautious about making causal inferences as there may be other important confounding variables which this study did not measure.

The findings from the longitudinal study in Chapter 3 also confirmed that attachment representations could fluctuate over a short period of time (e.g. Baldwin

& Fehr, 1995), and showed that attachment representations in individuals with psychosis fluctuate more than in the control group. It has been suggested that attachment instability may develop from early dysfunctional caregiving environments, which may distort beliefs about the self and others and lead to the development of incoherent models (e.g. Waters et al., 2000). It has been mentioned previously that individuals with psychosis often report traumatic experiences in childhood (Varese et al., 2012a), this may contribute to the development of these beliefs.

Previous ESM studies have shown that low self-esteem precedes the occurrence of paranoia (Thewissen et al., 2008; Thewissen et al., 2011). The study in Chapter 3 revealed that, when self-esteem was controlled for it did not precede the occurrence of paranoia, however elevated attachment insecurity continued to. This suggests that attachment representations may be more important in triggering paranoia. Two cross-sectional studies have shown that negative self-esteem mediated the association between insecure attachment and paranoia (Pickering et al., 2008; Wickham et al., 2015). In other cross-sectional studies it was shown that low self-esteem was related to insecure attachment (Collins & Read, 1990; Feeney & Noller, 1990). Although the findings in this study suggest that insecure attachment may be more important in triggering paranoia, the association between insecure attachment and low self-esteem requires further longitudinal exploration.

Although the findings in these studies showed strong evidence that insecure attachment is implicated in paranoid experiences, individuals with psychosis tend to experience multiple symptoms, and it was therefore important to explore how psychological mechanisms which are also thought to be involved, such as dissociation, interact with insecure attachment in their effect on paranoia. Previous

research has shown both cross-sectional and longitudinal associations between dissociation and auditory hallucinations (Varese et al., 2011; Varese et al., 2012b). The findings in Chapter 4 however found that dissociation was surprisingly associated with paranoia and not with hallucinations. A recent meta-analysis has shown evidence for a link between dissociation and auditory hallucinations (Pilton, Varese, Berry, & Bucci, 2015). The hallucinations variable included in the Chapter 4 analysis assessed all types of hallucinations, and it could be that other hallucinatory experiences are not associated with dissociation. To date only one other study has shown that depersonalisation, a type of dissociative experience, is associated with paranoia (Černis et al., 2014). It may be worth in the future to assess dissociation in individuals who experience paranoia. The findings in Chapter 4 also challenge Liotti's (2006) view that disorganised attachment is essentially a dissociative process. It was found that dissociation moderated the relationship between the anxious attachment dimension and paranoia but not the relationship between the avoidant attachment dimension and paranoia. This suggests that within the context of relationships, individuals with psychosis who have an increased negative view of the self may dissociate in an attempt to reduce such awareness.

It could be argued that fearful attachment is associated with a simultaneous negative view of the self and others, and that an increased negative view of the self could automatically lead those with a fearful attachment style to dissociate. However it may be premature to assume this. It could be that although these views may be held simultaneously, the levels with which these beliefs are held may not be equivalent, and may actually fluctuate. This is supported by the view that there may be multiple working models of the self, as an individual's view of the self is influenced by how worthwhile and acceptable the individual thinks he or she is to other people

(Pietromonaco & Barrett, 2000). Since the findings in Chapter 3 showed that attachment representations are inconsistent and highly fluctuating, it could also be that at times a negative view of self may be higher than a negative view of others and vice versa. This may be an important factor in understanding the complexity of the fearful attachment style, and its effect on psychotic symptoms.

Liotti and Gumley (2008) have suggested that an impairment in mentalisation may be a factor in determining whether disorganised attachment and traumatic experiences contribute to the development of psychosis. They propose that individuals with psychosis have a reduced self-reflective capacity, and that when faced with stressful life experiences this impairment may leave them vulnerable to psychotic experiences. Although in Chapter 4 it was suggested that dissociation acted to reduce awareness of the negative-self view, it cannot be determined whether these findings were a result of a reduced self-reflective capacity observed in the sample.

Overall, the findings suggest that childhood experiences of neglect may interfere with developing secure attachment, which may subsequently create a risk to developing adulthood paranoia. Furthermore, that in the flow of daily life, thoughts and feelings related to insecure attachment may act to trigger paranoia. Finally, that dissociation may act as a defence mechanism following negative-self appraisals.. It is not claimed that insecure attachment is the only psychological mechanism involved in paranoia, and that there will be a perfect fit between adverse experiences, psychological mechanisms, and psychotic symptoms, as there may be other important factors implicated in these associations.

5.4 Limitations

5.4.1 Theoretical issues in measuring attachment representations

There are several theoretical issues associated with assessing attachment, which may have affected the findings of these studies. The idea that individuals hold both general and specific attachment representation models (Collins & Read, 1994) has now been widely accepted. This however causes difficulty when it comes to measuring attachment. If individuals hold both general and specific attachment representation models, then which representations did they report? It could be that some individuals have reported their contextual attachment representation cued by the research setting. However it could also be that others reported their generalised attachment representations. In addition to this Pietromonaco and Barrett (2000) also questioned what it means to report generalised attachment representations. Does it mean that individuals report an average estimate on how they feel across all relationships and contexts, or that individuals report on the basis of their most frequent attachment relationship? It is possible that individuals have different strategies when it comes to assessing their general attachment representations (Pietromonaco & Barrett, 2000). Although it has been suggested that it is more likely for individuals to report their generalised attachment representations (Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996), the self-report attachment measures utilised in Chapter's 2, 3, and 4 were not able to detect these differences, or assess how the individual defined their generalised attachment representations.

5.4.2 Other limitations

Limitations are addressed in the discussion sections of each chapter. However some over-arching limitations will now be discussed. Two of the studies (Chapter 2 and 4) employed cross-sectional designs. The inferences and arguments about causality were justified theoretically and on the basis of previous research evidence. It could still be argued that, since the studies were not designed longitudinally, the

causal order of events cannot be ascertained, and that other directions of causality cannot be ruled out. The study in Chapter 3 brought more confidence to these inferences, as the associations between attachment insecurity and paranoia were assessed longitudinally. The findings supported the interpretations of causality made in the other studies.

It has been argued that discussing mediation in terms of whether it is ‘full’ and ‘partial’, as was done in Chapter 2, may not be as valuable as once thought. Hayes (2013) argues that there is often a misconception about full mediation, noting that it is often assumed that there is no further need to explore other mediating mechanisms after one mechanism appears to fully account for X’s effect on Y. Hayes continues by suggesting that researchers often think that, when partial mediation is found, it means the model has been misspecified, and that further investigations are needed to examine other mechanisms. He notes that the difference between partial and full mediation may be sample-size dependent, and that there therefore may not be any value in describing mediation using these terms. This argument strictly pertains to the interpretation of mediation analyses and not the actual statistical analysis. Although in Chapter 2 the results are interpreted using these terms, no claim is made that insecure attachment is the only psychological mechanism implicated in paranoia, and it is important for readers to be cautious in how they interpret these results.

Since evidence is consistent in showing that individuals with psychosis have had experiences of childhood trauma, it could be argued that controlling for post-traumatic stress disorder (PTSD) may be important, especially since PTSD has been reported to be commonly experienced by individuals with psychosis (Resnick, Bond, & Mueser, 2003). However, it has also been suggested that psychosis may increase

the risk to developing PTSD, for example through experiences such as hospitalisation (Mueser, Rosenberg, Goodman, & Trumbetta, 2002). In future studies, it will therefore be important to address the issue of PTSD in psychosis by selecting appropriate measures that take this overlap into account.

It has been proposed that specificity could be measured using a different statistical method. In their study van Nierop et al. (2014) used a mixed-effects logistic regression. Their analysis included six variables pertaining to childhood traumatic experiences, a dummy variable coded as 0 for hallucinations and 1 for delusions, and interaction terms between the childhood traumatic experiences and the dummy variable. It was mentioned that interaction terms can be “interpreted as the differential association of each type of trauma on hallucinations versus delusions” (supplementary box 1; van Nierop et al., 2014). The findings revealed that the effect of childhood trauma was not different for delusions and hallucinations, suggesting a lack of specificity. These authors further argued that observing greater effect sizes between specific types of traumas and specific types of psychotic symptoms does not indicate ‘etiopathogenesis’ (p.124). Since specificity research is in its infancy, the best suited statistical method for analysing specificity should be more closely examined.

The Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991) uses single-item questions to assess attachment style, and it could be argued that this measure may be limited in how sufficiently it can represent a complex construct like attachment (Nunnally & Bernstein, 1994). Despite this, the RQ is one of the most common measures used to assess attachment. It is quick and convenient, it has adequate reliability, and very good discriminant and face validity (Ravitz, Maunder, Hunter, Sthankiya, & Lancee, 2010). In addition, the RQ has shown convergent

validity with other explicit measures of attachment (Bartholomew & Shaver, 1998), suggesting that the measure is valid.

In Chapter 3 it cannot be ascertained which specific attachment style led to an increase in paranoia. The correlation analysis in Chapter 3 shows that attachment insecurity, as measured by the ESM attachment questions, correlated strongly with the fearful attachment style, as measured by the RQ. An interesting question is whether there really are different types of insecure attachment when looked at from a longitudinal perspective, or whether state attachment can be represented as a mix between attachment anxiety and avoidance and considered as strategies which fluctuate over time.

Although there is no evidence of any participant selection bias, the individuals who took part in the research studies (Chapter 3 and 4) were referred by a person involved in their care. It could be that the referrer referred only those he/she thought would engage in the research, and only those he/she had a good relationship with. Taking these factors into account the samples in this thesis may not necessarily be representative of a general psychosis population. The study in Chapter 2 used an epidemiological dataset and the issue of participant selection biases may be different in these circumstances; appropriate weights were used in the analysis.

The studies in this thesis did not differentiate between ‘poor me’ and ‘bad me’ paranoia (Trower & Chadwick, 1994). It could be that these two types of paranoia may be differentially associated with the phenomena tested in these studies. For example, there may be a difference in how these distinctions are associated with childhood traumatic experiences, and attachment representations.

Finally, it could be argued that current psychotic symptoms may impact on the way that individuals answered self-report questions. However, this is an issue which applies to any psychological study of psychosis and there is no evidence that it compromised the current studies.

5.5 Clinical implications

Despite the limitations of these studies there are several important clinical implications. At the highest level of generality, the findings in this thesis emphasise the importance of psychiatric staff promoting positive relationships by having an awareness of the client's attachment style, and the relational dynamics associated with that style. Past research has shown that individuals with secure attachments hold higher levels of curiosity (Mikulincer, 1997) and feel competent about mastering their environment (Pietromonaco & Barrett, 2000). It becomes increasingly important for psychiatric staff to promote positive relationships, but to be aware of the impact of the client's attachment style on relational dynamics. For example, if a patient has a highly avoidant attachment style, it may be appropriate to titrate interpersonal contact in such a way as to minimise the risk of avoidance and withdrawal. If the patient has high levels of attachment anxiety, by contrast, it may be necessary to provide constant reassurance and actively model a positive attitude towards the individual. In general, staff should consider strategies that always maximise the opportunities to reinforce a positive attitude towards the self and the perception that others are benign.

The assessment of childhood trauma in individuals with psychosis should now be routine in psychiatric services. Although specificity research is in its infancy, examining specific types of traumatic experiences and how they link to specific

symptoms of psychosis may also provide clinicians' clues as to the psychological mechanism implicated in these associations. For example, attachment representations appear to be particularly important in individuals with paranoid beliefs, and this knowledge may be helpful when clinicians interact with paranoid patients.

Psychological formulations should take the client's attachment style into consideration (Bendall, Jackson, & Hubert, 2010; Taylor, Rietzschel, Danquah, & Berry, 2014). Assessing the client's attachment style may inform strategies which the therapist and psychiatric staff can use to engage the client more effectively, and work towards building attachment security. Assessing the client's attachment style may also help the therapist and psychiatric staff reflect on the impact their own attachment styles can have on forming positive relationships with their clients (e.g. Berry et al., 2008).

The National Institute for Health and Care Excellence (NICE, 2014) guidelines recommend Cognitive Behavioural Therapy (CBT) as the evidence-based therapy for individuals with psychosis. In light of the evidence presented in this thesis, it may be possible to focus CBT interventions on challenging negative attachment representations about the self and others. It may also be important for therapists to be mindful of alternative therapies which can address attachment representations. Cognitive Analytic Therapy (CAT) for example emphasises the link between interpersonal relationships and psychosis (Taylor, Perry, Hutton, Seddon, & Tan, 2015). It has also been suggested that using compassion as part of Narrative Therapy can create a caring and warm space that is analogous of environments which promote secure attachments, and that may subsequently facilitate clients to engage with their distressing experiences (Gumley & MacBeth, 2014). Previous research has shown that improved therapy outcomes were associated with the clients' greater

attachment security to the therapist (Taylor et al., 2014). It is therefore highly important that psychiatric staff and therapists build trusting and positive relationships with their clients.

Finally, although specific mechanisms have been implicated in specific psychotic symptoms, therapists should take into consideration how psychological processes interact in their effect on psychotic symptoms, especially since individuals with psychosis often report experiencing multiple symptoms. Examining dissociation in individuals who experience paranoia, for example, may be important, as it seems that the dissociative process may inhibit the individual's access to attachment related beliefs about the self. This may be of importance to therapists as it may act as an impediment to therapy.

5.6 Policy implications

In concert with the findings presented in this thesis, and with previous studies which have shown associations between early life traumatic experiences and psychosis (e.g. Varese et al., 2012a), it is important for psychiatric services to practice within an approach that is trauma-informed. As of 2014 the NICE (2014) guidelines for individuals with psychosis have been modified accordingly to reflect the past decade of research evidence which has consistently linked childhood trauma to psychosis. These guidelines now recognise the need to assess the history of trauma and to provide trauma-based CBT. Policies also need to be put in place that require all psychiatric staff to receive trauma informed training.

The NICE guidelines also recognise the need for family members of individuals with psychosis to have access to family interventions. These guidelines propose that the intervention should “take account of the relationship between the

main carer and the person with psychosis” (p.178). There is no mention of what these family interventions should look like, and further guidelines which inform what it means to “take account of the relationship” need to be developed.

Family environments in which childhood traumatic experiences occur (e.g. physical and emotional abuse, witnessing domestic violence, and sexual abuse) constitute a high-risk population, and are associated with high social and health related lifetime costs (Moss et al., 2012). It is therefore necessary to devise evidence-based programs which promote optimal relationships between caregivers and children. The Video-feedback Intervention to Promote Positive Parenting (VIPPP), for example, is one brief and focused attachment-based parenting intervention program (Juffer, Bakermans-Kranenburg, & van Ijzendoorn, 2008). This intervention promotes parental sensitivity by initially teaching parents how to accurately recognise their child’s signals, and then by reinforcing adequate parental responses. This is achieved through reviewing video fragments of parental-child interactions. Devising policies that give access to such attachment-related interventions is important, as they may have long term benefits in improving population mental health. Since maltreating families also experience high levels of social isolation, mental health difficulties, stressful life events, and poverty (Trocmé et al., 2001), these factors may need to be considered for successful interventions to take place.

5.7 Future research designs

Future research should continue expanding and developing a further understanding of the psychological mechanisms associated with specific psychotic symptoms. Interventions that target these psychological mechanisms should subsequently be developed and tested. It could, for example, be examined which

psychological therapy may be best suited to address relational processes in individuals with paranoia, which subsequently leads to a reduction in symptoms. Also in line with the NICE guidelines recognising the need for family interventions, it becomes important to examine what these may look like. It may be that a similar VIPP approach is used, and that attachment is addressed systemically to develop overall familial attachment security. A strong evidence base is required to inform these guidelines.

In future research it may be fruitful to consider the relationship between attachment and the poor-me and bad-me subtypes of paranoia. It may also be important for future research to assess how traumatic experiences are interpreted, for example in terms of perpetrator and self-blame. It could be that different interpretations of the traumatic experiences could lead differently to ‘poor me’ and ‘bad me’ paranoia, through different attachment styles.

Although previous ESM research suggests that low self-esteem precedes an increase in paranoia (Thewissen et al., 2008; Thewissen et al., 2011), as mentioned in Chapter 3, low self-esteem did not precede the occurrence of paranoia when attachment insecurity was simultaneously included. Since cross-sectional research suggests that low self-esteem mediates the relationship between attachment and paranoia (Pickering et al., 2008; Wickham et al., 2015), it may be important to examine this relationship using longitudinal data, to determine whether in the flow of daily life low self-esteem mediates the relationship between attachment insecurity and paranoia. It has also been proposed that depressed mood is associated with paranoia and that this relationship is mediated by negative cognition (Fowler et al., 2012), it may be important to examine how attachment fits in that model.

The studies in this thesis focused on a psychological understanding of the link between childhood trauma, attachment representations, and psychotic symptoms, and future research may focus on a more integrated psychobiological understanding of these links. Barker, Gumley, Schwannauer, and Lawrie (2015) suggest that understanding the effect of the hypothalamic-pituitary-adrenal axis, the brain-derived neurotrophic factor, and oxytocin on the link between trauma and psychosis may be important in informing psychological interventions. It has for example been shown that oxytocin plays a critical role in attachment (Fonagy, Luyten & Strathearn, 2011). Examining the psychological and biological mechanisms together may provide a clearer understanding of the link between trauma and psychotic symptoms, and the link between attachment processes and paranoia.

It may also be important to assess gene x environment interactions in their effect on attachment and paranoia. Research has shown that children who had 5-HTTLPR polymorphism (short allele), and who were exposed to unresponsive mothers became less secure, but that, in children who had low genetic risk (long allele), mother responsiveness was not associated with attachment (Barry, Kochanska, & Philibert, 2008). It may therefore be of importance to examine how specific traumatic experiences interact with genes in their effect on attachment. It may also be important to examine how specific types of traumatic experiences interact with genes in their effect on psychotic symptoms. Taking genetic factors into account may lead a better understanding of these associations.

5.8 References

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Appendix A: Supplementary material from Chapter 2

Supplementary Table 1

Results of direct effects (c paths) between adverse events and symptoms.

Adverse Childhood Event	Paranoia <i>B (SE)</i>	Hallucinations <i>B (SE)</i>
Witness Injury/Killing	0.091 (.029)**	0.170 (.043)***
Rape	0.091 (.065)	0.395 (.110)***
Sexual Molestation	0.030 (.029)	0.241 (.058)***
Physical Attack/Assault	0.137 (.052)**	0.232 (.087)**
Physical Abuse	0.168 (.067)*	0.227 (.085)**
Neglect	0.167 (.074)*	0.181 (.096)
Held Captive/Threaten Weapon	0.206 (.048)***	0.288 (.079)***

Note: B = unstandardised b coefficients; SE = standard error.

p < .05; **p < .01; *p < .001*

Supplementary Table 2

Results of direct effects (a paths) between adverse events and attachment styles/depression.

Adverse Childhood Event	Secure (reversed) <i>B (SE)</i>	Avoidant <i>B (SE)</i>	Anxious <i>B (SE)</i>	Depression <i>B (SE)</i>
Witness Injury/Killing	-0.022 (.059)	-0.001 (.067)	-0.010 (.050)	0.657 (.161)***
Rape	0.055 (.106)	0.160 (.108)	0.391 (.143)**	0.961 (.321)**
Sexual Molestation	-0.041 (.062)	0.029 (.067)	0.081 (.068)	1.144 (.192)***
Physical Attack/Assault	0.023 (.090)	0.024 (.119)	-0.021 (.084)	0.338 (.266)
Physical Abuse	0.127 (.083)	0.147 (.092)	0.095 (.075)	0.934 (.247)***
Neglect	0.214 (.097)*	0.484 (.116)***	0.542 (.097)***	0.681 (.302)*
Held Captive/Threaten Weapon	0.266 (.076)***	0.320 (.091)***	0.135 (.078)	0.268 (.238)

Note: B = unstandardised b coefficients; SE = standard error.

p < .05; **p < .01; *p < .001*

Supplementary Table 3

Results of direct effects (b paths) between attachment styles/depression and symptoms.

Attachment Style	Paranoia <i>B (SE)</i>	Hallucinations <i>B (SE)</i>
Secure (reversed)	-0.003 (.008)	-0.004 (.011)
Avoidant	0.027 (.008)***	0.041 (.011)***
Anxious	0.065 (.010)***	0.056 (.013)***
Depression	0.031 (.003)***	0.042 (.004)***

Note: B = unstandardised b coefficients; SE = standard error.

p < .05; **p < .01; *p < .001*

Supplementary Table 4

Results of direct effects (c' paths) between adverse events and symptoms while controlling for mediators (attachment styles/depression) and confounding variables.

Symptom/Adverse Childhood Event	<i>B</i>	<i>SE</i>	95% <i>CI</i>	β
Paranoia				
Witness Injury/Killing	0.066	0.028	0.011 – 0.121	0.044*
Rape	0.039	0.059	-0.077 – 0.155	0.015
Sexual Molestation	0.003	0.028	-0.052 – 0.058	0.002
Physical Attack/Assault	0.126	0.051	0.026 – 0.226	0.051*
Physical Abuse	0.135	0.068	0.002 – 0.268	0.064*
Neglect	0.115	0.070	-0.022 – 0.252	0.045
Held Captive/Threaten Weapon	0.173	0.046	0.083 – 0.263	0.080***
Sex	-0.014	0.014	-0.041 – 0.013	-0.017
Age	-0.003	0.001	-0.005 – -0.001	-0.066***
Hallucinations				
Witness Injury/Killing	0.144	0.041	0.064 – 0.224	0.067***
Rape	0.332	0.106	0.124 – 0.540	0.084**
Sexual Molestation	0.204	0.058	0.090 – 0.318	0.082***
Physical Attack/Assault	0.228	0.086	0.059 – 0.397	0.064**
Physical Abuse	0.190	0.085	0.023 – 0.357	0.061*
Neglect	0.129	0.093	-0.053 – 0.311	0.035
Held Captive/Threaten Weapon	0.254	0.077	0.103 – 0.405	0.081**
Sex	0.016	0.018	-0.019 – 0.051	0.013
Age	-0.004	0.001	-0.006 – -0.002	-0.063***

Note: B = unstandardised b coefficients; SE = standard error; CI = confidence interval; β = standardised b coefficients.

p < .05; **p < .01; *p < .001*