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The Role of Adult Attachment Style in Psychosis

A Research Portfolio

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Doctorate in Clinical Psychology

University of Edinburgh

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Abstract

Background: Attachment theory represents a developmental framework which proposes that early relationships with primary caregivers have an enduring effect on interpersonal relationships, affect regulation and psychological functioning throughout the lifespan. It has been suggested that this occurs via the influence of internal representations regarding the self, others and relationships, which form the basis of an attachment style in adulthood. Attachment has been conceptualised as a constructive theoretical basis from which to consider psychological mechanisms underlying the emotional distress, interpersonal problems and difficulties in affect regulation commonly associated with psychosis.

Aims: A systematic literature review was conducted investigating the current research findings regarding adult attachment style in psychosis and clinical correlates of this. An empirical study used a cross-sectional design to investigate the role of adult attachment style in emotional recovery in psychosis. It was hypothesised that attachment insecurity would be associated with higher levels of depression and symptom-related distress. Interpersonal problems and emotion regulation were also investigated and it was predicted that these variables would mediate the relationship between attachment insecurity and increased emotional distress.

Method: Individuals with psychosis (n=70) completed self-report measures of adult attachment style, interpersonal problems and emotion regulation. Clinician-rated measures of depression and symptom-related distress were also completed.

Results: The literature review revealed that adult attachment style is of relevance in psychosis as consistent findings of greater attachment insecurity in psychosis compared with non-clinical populations have been reported. Adult attachment insecurity has been associated with a number of clinical outcomes in exploratory research. The empirical study found support for hypothesised associations between attachment insecurity and greater emotional distress. Predicted relationships were also supported between attachment insecurity and higher rates of interpersonal problems and more use of expressive suppression as an emotion regulation strategy. Interpersonal problems significantly mediated the relationship between attachment insecurity and emotional distress. The hypothesised mediating role of emotion regulation was not supported.

Conclusions: Findings of the empirical study suggest that insecurity in adult attachment style is an important variable in understanding emotional distress in individuals with psychosis and that difficulties in interpersonal functioning, as a mediating factor in this relationship, may represent a useful focus in clinical work.

Chapter 1: Systematic Review¹

1.1 Title page²

Title: The role of adult attachment style in psychosis: a systematic review.

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This review was completed as part of a Doctorate in Clinical Psychology undertaken with the University of Edinburgh and NHS Tayside.

¹Produced according to submission guidelines for *Clinical Psychology Review* (see Appendix A).

²Numbering of titles is included throughout for continuity of thesis but would not be included for submission. Tables are included as appendices at the end of the text as per journal guidelines.

1.2 Abstract

Attachment theory has been proposed as a useful framework for conceptualising the development and course of psychosis. This review aims to examine and evaluate the research to date concerning the role of adult attachment styles in psychosis and to summarise what is known about the qualities of attachment styles in this population and associations between attachment and clinically relevant correlates and outcomes. A systematic review of the literature identified 22 relevant studies. Results of these are presented in terms of findings regarding the characteristics of adult attachment styles in psychosis and clinical correlates investigated. Greater degrees of attachment insecurity in samples of people with psychosis compared with non-clinical controls are consistently reported. Preliminary evidence points towards associations between adult attachment insecurity and higher trauma prevalence, more difficulties in interpersonal functioning, poorer engagement with services, higher levels of depression and problematic adaptation to psychosis. Conflicting findings are reported in terms of the relationships between attachment styles and psychotic symptomatology. Implications for clinical practice and directions for future research are discussed.

Keywords: Attachment, relationship style, psychosis, schizophrenia

Highlights:

- The existing research base indicates that adult attachment style is pertinent to understandings of psychosis.
- Preliminary evidence is emerging regarding associations between adult attachment style and interpersonal functioning, service engagement, depression, trauma, emotion regulation and adaptation to psychosis.
- Future research should build on this preliminary evidence base using more refined hypotheses and larger samples.
- Attachment theory may be used in clinical practice to enhance service delivery for individuals with psychosis.

1.3 Introduction

Attachment theory proposes that the experiences of relationships with primary caregivers and the bonds formed during early childhood have an enduring effect on how individuals view relationships in adulthood (Bowlby, 1969; Cassidy & Shaver, 2008). It is suggested that this is due to the development of mental representations, or internal working models, of the self, others, emotions and expectations of social relationships (Bowlby, 1973). It has been proposed that these internal working models form the basis for attachment style in adulthood and thus influence psychological, social and emotional functioning (Mikulincer & Shaver, 2008). Attachment theory provides a template for understanding how interpersonal experiences and regulation of emotions can be implicated in both the development and maintenance of psychological distress (Dozier, Stovall-McClough & Albus, 2008; Mikulincer & Shaver, 2008). Whilst theoretical links between attachment style and psychological distress are well established, there has been little research investigating how adult attachment style may influence the course of illness in individuals who have experienced psychosis (Berry, Barrowclough & Wearden, 2007), perhaps due to the persistence of the outdated perception that psychotic symptomatology is less amenable than other mental health conditions to psychological approaches (Kuipers & Bebbington, 2006).

Attachment style can be categorised as secure, indicating positive early experiences and internal working models, or insecure, indicating difficult interpersonal experiences and more negative internal working models (Bowlby, 1969). A two-dimensional model of attachment security has been proposed and supported by factor analysis of measures of adult attachment (Brennan, Clarke & Shaver, 1998). In cognitive terms these dimensions are described as model of self and model of others (Bartholomew, 1990) and it has been suggested that attachment anxiety and avoidance could be emotional or behavioural equivalents of these (Crowell, Fraley & Shaver, 2008). Figure 1 illustrates how these dimensions can be used to classify attachment styles.

Figure 1.1: Model of attachment styles along two cognitive or emotional/behavioural dimensions (original model from Bartholomew, 1990; adapted version reproduced from Berry et al., 2007).

		MODEL OF SELF	
		Positive (<i>Low</i>)	(ANXIETY)
MODEL OF OTHER (AVOIDANCE)	Positive (<i>Low</i>)	Secure High self-worth, believes that others are responsive, comfortable with autonomy and in forming close relationships with others.	Preoccupied A sense of self-worth that is dependent on gaining the approval and acceptance of others.
	Negative (<i>High</i>)	Dismissing Overt positive self-view, denies feelings of subjective distress and dismisses the importance of close relationships.	Fearful Negative self-view, lack of trust in others, subsequent apprehension about close relationships and high levels of distress.

A burgeoning body of empirical evidence has established associations between insecurity in adult attachment style and a range of mental health difficulties (Dozier et al., 2008). In addition longitudinal research has found that insecure adult attachment predicted the onset of new episodes of depression and anxiety in a high-risk sample, and that insecure adult attachment styles partially mediated the relationship between adverse childhood experiences and psychopathology in adulthood (Bifulco, Kwon, Jacobs, Moran, Bunn & Beer, 2006). Until recently, despite the increasing awareness of the relevance of adult attachment insecurity in understanding psychopathology, research investigating the role of this construct in psychosis was still in its infancy (Berry et al., 2007).

Psychological understandings of the onset, maintenance, recovery trajectory and treatment options for psychosis have become increasingly prevalent over the past 3 decades – perhaps in response to a growing recognition of the limitations of the traditional medical model and antipsychotic medications (National Institute for Health and Clinical Excellence (NICE), 2009). Insights from attachment theory have been proposed to further inform and augment current psychological conceptualisations of psychosis (Berry et al., 2007). Cognitive-behavioural models of psychosis emphasise the roles of cognitive biases, dysfunctional schemas about the self, others and the world, poor social environment and regulation of emotional distress in the development and maintenance of psychosis, and stress the importance of the engagement process and therapeutic relationship in treatment (Garety, Kuipers, Fowler, Freeman & Bebbington, 2001; Kuipers & Bebbington, 2006).

Within these models, early and current adverse interpersonal experiences and trauma are hypothesised to increase vulnerability to onset, perpetuation and risk of relapse of psychotic symptoms (Garety et al., 2001; Kuipers & Bebbington, 2006). Social cognition, the processing and interpreting of social information, in particular has been implicated in understandings of psychosis (Penn, Corrigan, Bentall, Racenstein & Newman, 1997). Interpersonal difficulties and problems with social relationships are prevalent in psychotic illnesses (Grant, Addington, Addington & Konnert, 2001; Startup, 1998). Difficulties in regulation of emotions have also been demonstrated in individuals with psychosis (Van der Meer, van't Wout & Aleman, 2009; Kimhy, Vakhrusheva, Jobson-Ahmed, Tarrier, Malaspina & Gross, 2012). Therefore the central tenets of attachment theory are consistent with existing theoretical models of and research findings regarding psychosis and thus offer a valuable theoretical structure for integrating and advancing current understandings of psychosis.

Further evidence implicating attachment theory in psychosis can be found within the research regarding risk factors for developing psychotic illnesses. Adult attachment style is conjectured to primarily arise from early relationship experiences (Bowlby, 1969). Longitudinal research has reported that the risk of developing psychosis is higher for children born from an unwanted pregnancy, compared to those born from a wanted pregnancy (Myhrman, Rantakallio, Isohanni, Jones & Partanen, 1996). Early parental loss and interpersonal trauma in childhood have also been found to be associated with psychotic illnesses in adulthood (Agid, Shapira, Zislin, Ritsner, Hanin, Murad et al., 1999; Mueser, Goodman, Trumbetta, Rosenberg, Osher, Vidaver et al., 1998). Research investigating the parental representations of individuals with psychosis, using the Parental Bonding Instrument (PBI; Parker, Tupling & Brown, 1979), has reported that an 'affectionless control' parental style – which is characterised by low levels of care and high levels of overprotection – is more frequently reported by individuals with psychosis compared with non-clinical controls (Winther Helgeland & Torgersen, 1997; Willinger, Heiden, Meszaros, Formann & Aschauer, 2002; Rankin, Bentall, Hill & Kinderman, 2005). Reported low parental care on the PBI has also been reported to predict onset of psychotic symptoms, although this effect was reduced when exposure to trauma was also considered (Janssen, Krabbendam, Hanssen, Bak, Vollebergh, de Graaf et al., 2005). However the difficulty in drawing any conclusions regarding causal relationships is highlighted, as illness experiences such as paranoia may influence individuals' perceptions of early relationship

experiences (Rankin et al., 2005). Therefore it is possible that attachment style may represent a predisposing factor for the development of psychosis or that attachment insecurity may arise as a result of the illness experience itself, or, most probably, that a bidirectional relationship exists combining these two premises. Nevertheless the associations between difficult early relationship experiences and psychosis suggest that attachment theory may make an important contribution to understandings of this illness.

A growing field of evidence suggests that attachment style may be a useful structural model for developing psychological understandings of psychosis (Berry et al., 2007). Insecurity in adult attachment has been found to be positively associated with schizotypal traits in non-clinical samples, with specific associations between attachment anxiety and positive traits and attachment avoidance and negative traits (Berry, Wearden, Barrowclough & Liversidge, 2006; Berry, Band, Corcoran, Barrowclough & Wearden, 2007). Attachment insecurity has also been found to predict paranoia in an analogue sample (MacBeth, Schwannauer & Gumley, 2008). Research findings have also indicated higher levels of insecure attachment in groups of individuals with psychosis than in individuals with no mental health difficulties and also in comparison with groups with other mental health difficulties, for example depression or bipolar disorder (Dozier, Stevenson, Lee & Velligan, 1991). Increasing research and clinical interest in the roles of interpersonal functioning, social cognition and affect regulation in influencing the development and course of psychosis, and in how to integrate these factors into a framework for psychological formulation and intervention, has implicated attachment theory in the conceptualisation of psychosis (Berry et al., 2007).

1.3.1 Rationale for and aims of review

Considering the burgeoning interest in the role of attachment style in the development of and recovery from severe and enduring mental illnesses including psychosis, the current review is warranted to identify and synthesise existing research findings in the field and identify avenues for future research. As there has been a significant amount of new research in the last few years, this review hopes to build on the previous review in this field (Berry et al., 2007). The aims of this systematic review are to critically appraise the current research base regarding the relevance of adult attachment styles in individuals who have experienced psychosis, with particular focus on what is known about the nature of adult attachment styles in this population and clinically relevant correlates of attachment styles.

1.4 Method

1.4.1 Inclusion and exclusion criteria

Studies were included where the research population encompassed adults (aged 16 and above) with psychotic illnesses (where 50 per cent or above of the total sample were adults with a psychotic illness) and where a measure of adult attachment style was administered. Only research published in peer-reviewed journals was included and therefore research identified from dissertations, poster abstracts, conference presentations and book chapters was excluded. Due to the difficulties in accessing translation services only studies in the English language were included.

1.4.2 Search strategy

A literature search using the following databases was carried out in June 2012: EMBASE (1974 – June 2012), MEDLINE (1946 – June 2012), ASSIA (earliest – June 2012), PsycINFO (1987 – June 2012) and CINAHL. The search terminology used combined synonyms for psychotic spectrum disorders and attachment as follows: (psychotic OR psychosis OR schizo*) AND (attachment). Other appropriate search terms as identified by the individual databases were also included. These searches were repeated in April 2013 in order to identify any work published in the interim period.

Alongside these searches manual searches of the reference lists of identified studies and of a major review in the area (Berry et al., 2007) were conducted. A key author in the area (K. Berry, personal communication, 3rd July 2012) was also contacted via email in order to identify any studies in press or unpublished. No additional studies were identified by these means.

1.4.3 Search results

From the initial literature searches 2960 results were obtained (1515 from EMBASE, 831 from MEDLINE, 51 from ASSIA, 462 from PsycINFO and 101 from CINAHL). Following an initial screening of the titles and sources of the results 186 studies were retained. The abstracts of these studies were retrieved and screened, following which duplicates were removed and 25 studies were reviewed in full. Of these 5 were excluded on the basis of the sample population and 1 was excluded as it did not include a measure of adult attachment. The repeated searches identified 7 further studies to be reviewed in full, 3 of which were

excluded on the basis of the sample population and 1 as it did not include a measure of adult attachment. A total of 22 studies were thus subject to systematic review.

1.4.4 Critical appraisal of included studies

Studies were rated according to their suitability to address the aims of the current review. Many checklists for rating the quality of published studies are predominantly designed to evaluate research which utilises randomised controlled trial or other experimental methodology. As the studies identified for inclusion in the current review are all observational studies such checklists would not be appropriate. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) initiative (Vandenbroucke, von Elm, Altman, Gotzsche, Mulrow, Pocock et al., 2007) proposed a checklist of recommendations developed to ensure good quality reporting of observational research. Whilst the STROBE guidelines were not designed to provide a measure of study quality they do provide a framework by which to evaluate published observational research. In order to assess the capacity of the included studies to contribute to the evidence base in question, relevant items from the STROBE guidelines were used as a foundation from which a series of eight rating criteria were developed specifically to address the aims of this review. These were rated according to the grading criteria proposed by the Scottish Intercollegiate Guidelines Network (SIGN; 2011) using the following outcome ratings: 2 = well-covered, 1 = adequately addressed, 0 = poorly addressed/not addressed/not reported/not applicable. The eight checklist items included were as follows:

- The sample studied was representative of the general population of adults who have experienced psychosis (i.e. confirmed diagnosis of a psychotic spectrum illness).
- The measure of adult attachment style utilised demonstrated good reliability and validity.
- The attachment styles found in the sample are clearly described.
- Additional measures used demonstrated good reliability and validity.
- Potential confounding factors were acknowledged and controlled for where possible.
- A power calculation for the research is provided and sufficient power is achieved.

- Data analyses carried out and reported are appropriate to the study question.
- Generalisability, limitations and implications of the study findings are clearly discussed.

In order to ensure the reliability of the rating process a random sample of nine of the studies identified for inclusion were second-rated by a clinical psychologist working with the author. There was good overall agreement between reviewers with an agreement rate of 72 per cent. Where there was a discrepancy between the ratings this was discussed and an overall score was agreed by both reviewers in all cases. Each study was given a total score out of a maximum of 16. This score is not intended to provide an overall judgement of the value of the studies but to offer an approximation of the overall methodological quality and robustness of the results. Individual category ratings should be considered alongside the overall rating due to the diversity of study methodologies. The procedure for critically appraising the studies was not designed to address all comparative merits and limitations of the research in question, but rather to provide a guide as to the relative methodological strengths of the studies specifically to contribute to answering the questions of this review.

1.5 Results

1.5.1 Study characteristics

Table 1 details characteristics and key findings of the included studies. Of the 22 studies identified for inclusion in the current review 19 employed a cross-sectional study design and 3 utilised a mixed prospective cohort and cross-sectional design. 21 of the included studies primarily used quantitative methods and 1 used qualitative analyses. The majority of quantitative studies employed statistics of association in data analysis. The mean sample size was 58.1 and ranged from 9 to 110 participants in quantitative studies, with 8 participants in the qualitative study. All but 2 of the studies had a predominantly male sample. Six studies used the narrative-based Adult Attachment Interview (AAI; George, Kaplan & Main, 1985, 1996) as the primary measure of attachment while the remaining 16 employed a self-report measure. Of the studies adopting self-report measures of attachment 10 used the Psychosis Attachment Measure (PAM; Berry et al., 2006) as the primary measure, 2 used the Attachment Style Questionnaire (ASQ; Feeney, Noller & Hanrahan, 1994), 2 used the Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991), 1 used the Revised Adult Attachment Scale (RAAS; Collins, 1996) and 1 used the Adult Attachment Styles questionnaire (Hazan & Shaver, 1987). Two studies additionally used an informant version of the PAM. Schizophrenia was the most common diagnosis amongst study samples. Seven studies recruited mixed diagnostic samples (i.e. not exclusively participants with psychotic disorders) but were included as they reported a majority of participants with a psychotic disorder. Two studies specifically recruited a sample with first-episode psychosis (Couture, Lecomte & Leclerc, 2007; MacBeth, Gumley, Schwannauer & Fisher, 2011).

1.5.2 Critical appraisal of study quality

Table 2 details quality ratings for all studies. In general samples were representative of the wider population of individuals with psychosis; however 7 studies received a lower rating due to having mixed psychiatric samples. All studies used existing measures of adult attachment style, the majority of which demonstrated good reliability and validity. Studies utilising the Relationship Questionnaire or the Adult Attachment Styles received lower ratings as these measures display less well-established evidence of reliability and validity

(Ravitz, Maunder, Hunter, Sthankiya & Lancee, 2010) and more robust measures could have been used. Studies using the PAM tended not to report attachment styles in the sample as the measure is not designed to facilitate categorisation of attachment styles. However Kvrđic and colleagues (2011) calculated a difference score on the PAM (anxiety score – avoidance score) from which they could report whether participants demonstrated a tendency to a more anxious or avoidant style overall. Two studies provided mean scores for the anxiety and avoidance sub-scales of the PAM which allowed for comparison with non-clinical populations (Arbuckle, Berry, Taylor & Kennedy, 2012; Blackburn, Berry & Cohen, 2010). Only one study (Mulligan & Lavender, 2010) reported a power calculation for the research.

1.5.3 Study findings

Findings of the studies will be discussed in terms of the review aims – first exploring the methods used to assess attachment and the nature of adult attachment styles in samples with psychosis, then describing the findings as regards associations between attachment and clinical characteristics.

1.5.4 Methods used to assess attachment style

The studies identified in the current review reflect the two dominant theoretical paradigms in assessing attachment styles in adulthood – namely the narrative approach and the self-report approach. The narrative approach to assessment of attachment is epitomised by the Adult Attachment Interview (AAI; George et al., 1985, 1996) and is rooted in the identification and interpretation of ‘attachment states of mind’ via a structured interview reflecting on parental-child relationships. The self-report method requires individuals to reflect on their current interpersonal relationships and to rate themselves according to how much they identify with statements or descriptions designed to tap into the attachment dimensions of anxiety and avoidance (Berry et al., 2006, Crowell et al., 2008).

There has been some debate in the literature as to whether the narrative methodology for assessing attachment style is reliable in individuals with psychosis, due to conceptual disorganisation and cognitive impairment which may present as features of the illness

(Berry et al., 2006). Some authors have therefore modified the AAI for use with individuals with psychosis (Dozier & Lee, 1995, Dozier, Cue & Barnett, 1994), by making questions less abstract and breaking more complex questions into their component parts. However the finding that attachment styles as classified by the AAI are not significantly associated with any aspect of psychotic psycho-pathology, as measured by the PANSS, appears to contradict previous suggestions that the narrative basis of the AAI is not reliable in individuals with psychosis (MacBeth et al., 2011).

In terms of the self-report paradigm of assessing adult attachment style, a significant development in recent years has been the development of the PAM, which is specifically designed to assess adult attachment style in individuals who have experienced psychosis, and takes account of possible cognitive deficits and likely social isolation (Berry et al., 2006). The PAM does not refer specifically to romantic relationships, unlike some other self-report questionnaires assessing adult attachment styles, acknowledging that individuals who have psychosis are often socially isolated and therefore questions relating to romantic attachments may have less relevance in this population (Berry et al., 2006). In Berry and colleagues' (2008) study, participants were asked to complete the self-report attachment measure for all persons who were important in their life, whom they saw regularly and with whom they had close emotional ties. The median number of measures completed was 2 (range=1-4), indicating that participants had frequent contact and a close relationship with a median of 2 people, and only 12 per cent (n=7) completed the measure in relation to romantic partners (Berry et al., 2008). This result appears to lend credence to the rationale underlying the design of the PAM. Potentially self-report questionnaires which specify that responses should be made in relation to romantic relationships are therefore less valid in this population (e.g. Revised Adult Attachment Scale; Collins, 1996) thus limiting the conclusions which can be drawn from research utilising such instruments. In the ten studies in the current review which utilised the PAM, alpha coefficients were reported between .69 and .91, indicating good reliability.

Informant report measures are introduced as a third approach to assessing adult attachment styles in individuals with psychosis by Berry and colleagues (2010). Self-report measures are dependent on the cognitive ability to access memories, feelings and intentions, which may be impaired or disrupted in individuals experiencing psychotic

symptoms (Crowell et al., 2008; Berry et al., 2006). The observer report approach to assessing attachment styles in children is well-established, for example in The Strange Situation assessment paradigm (Ainsworth, 1978). It is suggested that as mental health professionals are likely to have contact with individuals in times of distress, when the attachment system is activated, they may be well-placed to observe behavioural manifestations of the attachment styles of individuals with psychosis (Berry, Wearden & Barrowclough, 2010). They developed an informant-report version of the PAM and piloted this with a small sample of patients and staff. Results indicated reasonable levels of convergence in ratings by different staff members (interclass correlation coefficients of .77 and .64 for the anxiety and avoidance sub-scales respectively). There was an indication in the results that staff who had known patients for a longer period of time were less likely to deviate from mean ratings, and that the attachment style of the staff member may influence ratings, with a tendency for staff with higher levels of anxiety and avoidance to rate patients as more securely attached. This work was extended by Arbuckle and colleagues (2012) using the PAM with a relatively small sample, and variable levels of concurrence between self-reported attachment style and informant-reported attachment style were reported. Therefore at present, although there are preliminary studies into the reliability and validity of informant-reported attachment style for individuals with psychosis, the findings are inconsistent and inconclusive.

1.5.5 Nature of attachment styles in individuals who have experienced psychosis

Six studies clearly categorised and reported the distribution of classifications of attachment styles in their sample. Results of 3 of these studies (Dozier & Lee, 1995; MacBeth et al., 2011; Ponizovsky, Nechamkin & Rosca, 2007) reported that the largest proportion of their sample was classified as having a dismissing or avoidant attachment style (64 per cent, 62 per cent and 57 per cent respectively). Kvirgic and colleagues (2011) reported that 65 per cent of their sample exhibited higher levels of avoidant attachment compared to anxious attachment. One study (Couture et al., 2007) reported that the most common attachment style found in their sample was preoccupied (63 per cent of males and 39 per cent of females), followed by ambivalent (28 per cent of males and 32 per cent of females). The

majority (45 per cent) of Dodwell and colleagues' (2012) small mixed psychiatric sample identified with a description of fearful attachment style.

Five studies compared adult attachment styles found in a clinical sample of individuals with psychosis with styles reported in a non-clinical control group or sample. All of these studies reported significant between-group differences in attachment styles, with clinical samples being significantly less likely to be classified as secure and more likely to score highly or be classified on dimensions of attachment insecurity (Couture et al., 2007; Mulligan & Lavender, 2010; MacBeth et al., 2011; Ponizovsky et al., 2007; Donohoe, Spoletini, McGlade, Behan, Hayden, O'Donoghue et al., 2008). Arbuckle and colleagues (2012) however reported that mean scores on the anxiety and avoidance dimensions of the PAM were largely similar to mean scores reported in a previous study conducted with a student sample.

Although the evidence appears to strongly support the theory that insecure attachment styles are more prevalent in individuals with psychosis than in non-clinical populations, it is also noted by MacBeth and colleagues (2011) that attachment styles were heterogeneous in their sample, with 27 per cent of their sample being categorised as securely attached. This is reflected in other studies which reported between 13 and 25 per cent of the sample exhibiting secure or autonomous attachment styles (Couture et al., 2007; Dodwell et al., 2012; Ponizovsky et al., 2007). Therefore it is important to acknowledge that insecure adult attachment and psychosis are not synonymous with one another. In addition, MacBeth and colleagues (2011) compared their sample of individuals with a first episode of psychosis to Tyrell and colleague's (1999) sample of individuals with chronic mental health difficulties, with the first episode sample exhibiting a significantly higher proportion of secure classifications. This suggests that attachment styles in individuals with psychosis may change over time, perhaps influenced by the course of illness although further longitudinal research would be necessary to investigate this hypothesis further.

There is some evidence of an interaction between gender and attachment style in individuals who have experienced psychosis, as Couture and colleagues (2007) report that males in the clinical sample were less likely than males in the non-clinical control group to report avoidant attachment styles, but more likely to report preoccupied attachment;

whereas females with psychosis were less likely to report preoccupied attachment styles and more likely to report avoidant attachment styles than females in the control group. Mulligan and Lavender (2010) also report gender differences in attachment styles in their clinical sample, with females scoring significantly higher on the preoccupation sub-scale and males scoring higher on the avoidance sub-scale. Males were also found to score higher on attachment avoidance using the PAM (Berry et al., 2008).

1.5.6 Attachment styles and psychotic symptoms

Eight studies investigated relationships between attachment styles and clinical symptoms of psychosis. Whilst some studies found an association between attachment styles and psychotic symptomatology, others found no correlation between these factors. Attachment avoidance was positively associated with paranoia (Berry et al., 2008), positive symptoms (Berry et al., 2008; Kvirgic et al., 2011; Ponizovsky et al., 2007) and negative symptoms of psychosis (Berry et al., 2008; Ponizovsky et al., 2007). Attachment anxiety was found to positively correlate with negative symptoms (Ponizovsky et al., 2007), positive symptoms (Tait, Birchwood & Trower, 2004) and severity of voices and distress in relation to these (Berry, Wearden, Barrowclough, Oakland & Bradley, 2012). Attachment avoidance was found to be associated with themes of threat and rejection/criticism in auditory hallucinations (Berry et al., 2012). An interaction between attachment style and symptoms was also reported, whereby individuals who were classified as having a preoccupied attachment style self-reported significantly more symptoms than those assessed as employing dismissing attachment strategies; however based on observer report, those with dismissing attachment styles were more symptomatic (Dozier & Lee, 1995). Two studies reported no associations between clinical symptoms of psychosis and attachment styles (Arbuckle et al., 2012; MacBeth et al., 2011) although small sample sizes in each of these studies may have contributed to the lack of significant results. Self-reported attachment scores have been demonstrated to be positively correlated across psychiatric stable and unstable groups, suggesting that attachment style is a meaningful and enduring individual difference variable in individuals with psychosis regardless of illness severity or symptomatology (Berry et al., 2008). Therefore findings regarding relationships between dimensions of attachment insecurity and symptoms of psychosis are inconclusive at this stage as some contradictory evidence is apparent and findings have not been consistently

replicated. Available evidence does however point to possible complex interactions between attachment styles and aspects of psychotic symptomatology.

1.5.7 Attachment styles and co-morbid mental health difficulties

Two studies reported on associations between attachment style and trauma prevalence and symptoms. Berry and colleagues (2009) reported high levels of trauma in their clinical sample, with 93 per cent reporting at least one type of trauma and 83 per cent reporting interpersonal trauma. Higher levels of attachment anxiety were reported by individuals who had experienced interpersonal trauma with significant others in childhood, although this effect was not significant when levels of depression were taken into account. Similar levels of trauma prevalence (91 per cent) were reported by Picken and colleagues (2010) who also reported that attachment anxiety was associated with a greater number of traumatic events (particularly interpersonal trauma) and symptoms of post-traumatic stress disorder (PTSD). They also reported discrepancies between self-reported trauma prevalence and clinician-reported trauma prevalence, with patients self-reporting significantly more traumatic events, indicating that trauma experienced by individuals with psychosis may be overlooked in clinical settings (Picken, Berry, TARRIER & Barrowclough, 2010).

Four studies investigated associations between attachment and depression. Higher levels of depression were associated with higher levels of attachment avoidance (Arbuckle et al., 2012), attachment anxiety (Berry et al., 2009) and less security in attachment to mental health services (Blackburn et al., 2010). Kvirgin and colleagues (2011) found significant relationships between depression and both dimensions of attachment with a trend towards higher depression scores in individuals with predominantly anxious attachment styles compared with predominantly avoidant.

Insecure-preoccupied attachment style has been associated with less improvement in terms of general distress over a period of staff change in an in-patient setting (Dodwell et al., 2012); however this was based on a small sample of mixed-diagnosis psychiatric in-patients where potential confounds were not adequately explored, and therefore it is not

possible to draw conclusions from this finding. Insecure attachment styles have also been associated with longer periods of hospitalization (Ponizovsky et al., 2007).

1.5.8 Attachment styles and adaptation to psychosis

Six studies reported on aspects of attachment style and its relationship to adaptation following psychosis. One study used qualitative methodology (grounded theory) to investigate adaptation to psychosis in young people and how reflective functioning influences this (Braehler & Schwannauer, 2012). Reflective functioning, or mentalization, is the capacity to infer one's own and others' mental states in order to predict and plan behaviour, and is conceptualised as being rooted in attachment experiences (Braehler & Schwannauer, 2012). Themes from this study suggested that impaired reflective functioning in relation to attachment narratives was associated with poorer adaptation and individuation following psychosis. This may suggest that more developed reflective functioning, underpinned by more secure attachment styles, plays a moderating role between the experience of psychosis and positive adaptation. Two studies (Mulligan & Lavender, 2010; Tait et al., 2004) reported associations between attachment insecurity and a recovery style characterised by 'sealing over', or an inability to integrate the illness experience. Attachment avoidance was associated with features of the course of psychotic illness, namely younger age of onset of psychosis and longer time spent hospitalized (Ponizovsky et al., 2007). Higher levels of attachment anxiety were related to greater symptom-related distress in one study (Berry et al., 2012). MacBeth and colleagues (2011) investigated associations between attachment and quality of life but no significant correlations were found. Findings are diverse in this area but overall indicate that attachment may be relevant in understanding how individuals respond and adapt to the experience of psychosis.

1.5.9 Attachment styles and service engagement

Ten studies investigated the relationship between attachment style and aspects of engagement with services. Significant associations have been found in three studies between attachment insecurity and poorer engagement with mental health services (Berry et al., 2007; MacBeth et al., 2011; Tait et al., 2004). However Kvrjic and colleagues (2011)

failed to fully replicate these results and found a correlation between attachment anxiety and treatment adherence, but no relationships with other aspects of service engagement. Attachment avoidance in particular has been found to be associated with difficulties in engaging in therapeutic relationships (Berry et al., 2008; Berry et al., 2007; Kvirgic et al., 2011; MacBeth et al., 2011). Patients with more dismissing attachment styles were more likely to divert from an interpersonal problem-solving task with clinicians (Dozier et al., 2001). In general the findings suggest that higher attachment insecurity is associated with poorer engagement with services, especially in the case of attachment avoidance.

Therapeutic relationships have been conceptualised as attachment relationships, and three studies examined specific attachments to mental health professionals, teams or services. Significantly lower levels of attachment anxiety were reported in key-worker relationships compared with parental or general relationships, and lower levels of avoidance in parental relationships compared with general relationships (Berry et al., 2007). This result was replicated by Arbuckle and colleagues (2012) who reported that self-reported levels of attachment anxiety and avoidance were significantly lower in the context of therapeutic relationships compared with general relationships. Insecurity in adult attachment style was found to predict less secure attachment relationships to an in-patient psychiatric rehabilitation service (Blackburn et al., 2008).

The bidirectional nature of attachment relationships, where the attachment style of each individual influences the nature of interactions, has been the focus of three studies. Attachment insecurity in clinicians was associated with a tendency to intervene more closely with patients with a preoccupied rather than dismissing style, and clinicians classified with a preoccupied attachment style were more likely to deliver a greater depth of intervention compared with clinicians with an avoidant style (Dozier et al., 1994). Avoidant attachment styles in individuals with severe and enduring mental health problems (including but not exclusively psychosis) have also been associated with less time spent in therapeutic interactions with case managers. An interaction was found between patient and case manager attachment avoidance by Tyrell and colleagues (1999), with patients with more dismissing attachment styles reporting better working alliances with less dismissing case managers and less dismissing patients reporting a better working alliance with more dismissing case managers.

1.5.10 Attachment styles and social functioning

Three studies have investigated adult attachment style and aspects of social or interpersonal functioning. Significant correlations were found between attachment avoidance and social skills and quality of life, and between attachment preoccupation and quality of life (Couture et al., 2007). Significant associations between attachment insecurity and interpersonal problems have been reported, with specific links between attachment anxiety and overly demanding behaviour and attachment avoidance and interpersonal hostility (Berry et al., 2008). Associations between social cognition, specifically attributional style which is argued to be key in facilitating flexible interaction in interpersonal situations, and attachment style were investigated in one study (Donohoe et al., 2008). Higher attachment security was significantly associated with a lower tendency to attribute negative events to others rather than to situational factors (personalising bias). Dozier and colleagues (2001) investigated how attachment styles influenced responses in an interpersonal problem solving task with a family member or partner and reported that more individuals with more dismissing attachment styles were more rejecting of their significant other during the task and that their significant others felt less supported and higher levels of sadness, compared with partners of those with preoccupied attachment styles.

1.5.11 Attachment and emotion regulation

One study investigated the relationship between attachment and emotion regulation and reported that greater attachment anxiety and avoidance were associated with significantly more problems of emotion regulation (Owens, Haddock & Berry, 2012).

1.6 Discussion

1.6.1 Synthesis of findings

The available evidence strongly suggests that adult attachment style is of relevance in understanding psychosis, as significant between-group differences have been consistently found indicating greater attachment insecurity in individuals with psychosis compared with non-clinical controls. Differing methods of assessing attachment in adults with psychosis, reflecting the self-report and narrative traditions, have been used and reported to be valid and reliable in this population. Preliminary findings on the reliability and validity of using informant-based measures are inconclusive. Findings regarding the associations between adult attachment style and symptoms of psychosis are variable although complex relationships between attachment dimensions and psychotic symptom profiles are emerging. Initial evidence is also becoming apparent suggesting the relevance of trauma in understanding attachment styles in psychosis. Evidence is also emerging regarding patterns of association between attachment styles, interpersonal functioning, service engagement and adaptation to psychosis.

1.6.2 Limitations of review

A number of limitations should be taken into account when considering the results of this review. As only published studies and studies in the English language were eligible for inclusion, relevant findings from other sources may have been overlooked. Due to the heterogeneous nature of the studies included in this review, both in terms of aims and methodologies, meta-analysis of the available data was not possible. Therefore where findings have been reported consistently across more than one study it has not been possible to quantify these. Several studies with samples not exclusively consisting of individuals with psychosis were included in the review. It was considered that due to the relative paucity of research in this area, an inclusive approach incorporating work with samples consisting of a majority of psychotic spectrum diagnoses was appropriate. However this diversity limits the conclusions which can be drawn from the review. As the research base grows and becomes more homogeneous (for example by the growing use of the PAM as a reliable and valid measure of adult attachment) it may be possible to conduct

a further review employing more stringent criteria for inclusion/exclusion which would allow more definite conclusions to be reached.

1.6.3 Methodological issues in current research base

Berry and colleagues (2007) in the previous review in this area identified that the heterogeneity of research populations (e.g. Dozier and colleagues' studies) was a methodological issue which constrained the conclusions which could be drawn from the research base. More recent studies have started to address this issue by implementing more stringent and diagnostic based inclusion criteria. However recent debates on the reliability and construct validity of diagnostic categories such as schizophrenia (Bentall, 2003) may also be taken into consideration, and it may be that in future research recruitment on the basis of experience of psychosis regardless of diagnosis is considered to be the most appropriate method for selecting research populations.

Many of the included studies consisted of multiple hypotheses and predicted associations between attachment and other characteristics. This is appropriate given the emerging nature of the evidence base meaning that many studies are exploratory in nature and hypotheses are theoretically driven. However as the evidence-base for the correlates of attachment style in individuals with psychosis grows, research utilising more refined and specific hypotheses can be developed allowing for more robust findings.

The majority of the studies included in the current review did not address the question of statistical power, and many relied on relatively small sample sizes. This issue has been addressed by more recent studies, which have had larger research populations and included power calculations.

1.6.4 Implications for clinical practice

Several studies investigated the relationships between attachment styles as rated in the context of general relationships and attachment styles relating to specific relationships. Although attachment styles when rated in relation to relationships in general have been associated with those in specific relationships (Berry et al., 2007), there is also evidence

that attachment varies in different relationships (Arbuckle et al., 2012; Berry et al., 2007). Therefore mental health professionals may be able to foster more secure attachment relationships with individuals despite a generally insecure style, thus contributing to the gradual revision of internal working models over the course of time. Interactions between staff and patient attachment styles should be considered in clinical practice, perhaps by discussion of potential issues in clinical supervision.

Studies have also investigated whether mental health key workers or teams can reliably assess patients' attachment styles. The evidence suggests that self-report remains the most reliable method for assessing attachment style, and therefore patients should be consulted regarding this at assessment. The PAM is emerging as a reliable and valid instrument for assessing attachment styles in individuals with psychosis, and the concise and user-friendly nature of this measure make it well-placed for routine use in clinical practice. Considering the associations between insecure attachment styles (particularly avoidance) and poorer engagement with services, assessment of attachment styles on first presentation to services may be beneficial in identifying patients who may require additional support to facilitate their engagement with treatment.

The findings of this review suggest that attachment theory may be a useful conceptual structure for informing service development and delivery. Recommendations have been put forward regarding how 'attachment-informed' services may be designed and benefit patient care (Seager, 2007) and as the research base regarding the relevance of attachment theory in clinical settings with people with psychosis such proposals may become increasingly pertinent.

Findings of associations between adult attachment style and psychotic symptoms provide support for cognitive models of psychosis, which propose that negative beliefs about the self or others and social withdrawal are maintaining factors for both positive and negative symptoms of psychosis (Berry et al., 2008; Garety et al., 2001). The reported relationships between attachment styles and specific interpersonal difficulties suggest that an interpersonal focus in psychological therapies for psychosis may be beneficial (Berry et al., 2008). Cognitive behavioural therapy for psychosis (CBTp), which currently has the strongest evidence base in terms of formally recommended individual psychological

interventions for psychosis (NICE, 2009; SIGN, 2013), has been found to have limited impact on social functioning (Berry et al., 2009; Penn, Mueser, Tarrrier, Gloege, Cather, Serrano et al., 2004) and therefore integrating interpersonal strategies may improve outcomes. An integrative approach incorporating cognitive and behavioural strategies and interpersonal context to address emotional distress in individuals with psychosis may be valuable, such as the Cognitive Interpersonal Therapy (CIT) treatment model described by Gumley & Schwannauer (2006) which has its theoretical underpinnings rooted in attachment theory. Findings regarding the role of reflective functioning, or mentalization, in adaptation following psychosis also suggests that psychological therapies for psychosis may benefit from routine consideration of an individual's mentalization capacity, and facilitating reflection on experiences and emotions where appropriate (Braehler & Schwannauer, 2012).

1.6.5 Future research

The results of this review indicate a number of avenues for expansion of the research base. Future research should investigate factors which may contribute to the development of more secure attachment relationships in individuals with psychosis in order to contribute to recommendations regarding developing attachment-informed services (Berry et al., 2007). There is evidence that attachment styles may vary between individuals experiencing a first episode of psychosis and those with a chronic mental illness history (MacBeth et al., 2011). It has been suggested that the experience of psychosis itself may lead to a revision of internal working models of relationships (Berry et al., 2009). The experience of psychosis has been conceptualised as a traumatic life event (Gumley & Schwannauer, 2006) and as such may affect attachment styles. Longitudinal research following a sample of individuals from high-risk or first episode onwards may help elucidate these issues (Berry et al., 2008). Research to replicate existing findings regarding attachment in psychosis and its correlates using different methods of assessing attachment style (i.e. narrative-based versus self-report) would improve robustness of findings (Berry et al 2008).

Whilst work on the reliability and validity of informant-based methods of assessing attachment style in adults indicates that observer reports of attachment behaviours may be valid indicators of an individual's general attachment style, findings in this area are not conclusive enough to make recommendations regarding use of informant-based

assessment in clinical practice. Further research employing larger samples would help to clarify whether informant-based assessments of adult attachment style are reliable, valid and clinically useful. A useful direction for future research may be to explore whether informant ratings predict individuals' behaviour in times of distress (Berry et al., 2010).

Attachment theory is not in essence a theory of psychopathology but of human relationships and interactions in general (Bowlby, 1969). As measures of adult attachment style tend to focus on dimensions of attachment insecurity this limits the scope of the research as factors such as resilience are not routinely investigated (Berry et al., 2008). Qualitative methodologies such as the study conducted by Braehler and Schwannauer (2012) may provide valuable insights into attachment as a resilience factor in adapting to the challenge of psychosis.

The importance of considering psychological factors such as attachment style in psychosis is becoming more widely acknowledged. However research into the psychological processes linked to attachment which may impede recovery, such as difficulties in relationships or poor regulation of emotional distress, needs to be expanded upon. The majority of studies in the current review utilised statistics of association. This research base may be built on by employing more refined hypotheses – based on the associations identified in the existing research base - and model-testing methods which may shed more light on the mediating and moderating factors which link attachment style to different aspects of symptomatology and recovery in psychosis.

1.6.6 Conclusions

The results of this review suggest that attachment theory is of increasing relevance and importance in understanding psychosis. This is reflected in the expansion of the research base in recent years and further research is warranted to further investigate how attachment can contribute to patient care.

1.6.7 Acknowledgements

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Appendix A

Table 1.1: Study characteristics (presented alphabetically)

Reference (country of research)	Study design	Number of participants (%male/female); diagnosis(es); mean age (SD)	Measure of attachment	Summary of key findings
Arbuckle et al., 2012 (UK)	Cross-sectional	24 (62.5% male, 37.5% female) Schizophrenia or related psychosis 32.38 (8.65)	Psychosis Attachment Measure (PAM)	Large and significant correlations between self-reported attachment in general relationships and self-reported attachment in specific relationships (key worker, mental health team). Inconsistent evidence of associations between self-reported and informant-rated attachment styles. Significantly higher levels of self-reported attachment avoidance and anxiety in general relationships compared with key worker or team relationships.
Berry et al., 2008 (UK)	Prospective cohort and cross-sectional	96 (54 at follow-up) (68% male, 32% female) Schizophrenia, schizoaffective or non-affective psychosis 44 (12.8)	PAM	Attachment avoidance significantly associated with positive symptoms, negative symptoms and paranoia. Attachment avoidance and anxiety associated with interpersonal problems, and attachment avoidance associated with difficulties in therapeutic relationships. Attachment ratings relatively stable over time; although positive correlation between changes in attachment anxiety and changes in symptoms.
Berry et al., 2009 (UK)	Cross-sectional	80 (66.3% male, 36.7% female) Schizophrenia, schizotypal or delusional disorder 44 (13.3)	PAM	Significant moderate negative correlations between parental care and attachment avoidance. Attachment anxiety associated with childhood interpersonal trauma. Significant moderate-strong correlations between attachment anxiety and depression.
Berry et al. 2007 (UK)	Cross-sectional	58 (63.8% male, 36.2% female) Schizophrenia, schizotypal or delusional disorder 45.91 (13.5)	PAM	Attachment style in general relationships moderately-strongly positively correlated with attachment style in specific key worker and parental relationships. Significantly lower levels of attachment anxiety in key worker relationships compared with parental or general relationships and significantly lower levels of avoidance in parental relationships compared with general relationships.

Berry et al., 2010 (UK)	Cross-sectional	9 (100% male) Schizophrenia (n = 8), schizoaffective disorder (n = 1) 49.11 (11.13)	PAM (informant report)	Reasonable levels of inter-rater reliability between staff's ratings of patients' attachment anxiety and avoidance. Divergence in ratings related to length of time known patient and staff attachment anxiety and avoidance.
Berry et al., 2012 (UK)	Cross-sectional	73 (82.8% male, 17.2% female) Schizophrenia (n=58), schizoaffective disorder (n=7), psychotic episode (n=8) 39.1 (11.3)	PAM	Significant positive associations between attachment anxiety and severity of voices and distress in relation to voices. No significant associations between these dimensions and attachment avoidance. Significant associations between attachment avoidance and themes of criticism/rejection and threat in voices. No significant associations between attachment anxiety and voice themes.
Blackburn et al., 2010 (UK)	Cross-sectional	78 (79.5% male, 20.5% female) Schizophrenia (n = 69), bipolar disorder (n = 5), substance misuse (n = 3), Asperger's Syndrome (n = 1) 39 (13.78)	PAM; Service Attachment Questionnaire	Significant medium negative associations between adult attachment style and attachment to services, and between depression and attachment to services. Insecure attachment style associated with lower level of attachment to services. Higher levels of depression associated with lower attachment to services. Attachment to services predicted by adult attachment style, depression and section status.
Braehler & Schwannauer, 2012 (UK)	Cross-sectional; qualitative methodology	8 (50% male, 50% female) Psychotic disorders (schizophrenia-like psychosis, schizoaffective disorder, bipolar disorder, psychotic depression) 18.6 (SD not reported, range 18-21)	AAI	Reflective functioning may moderate between adaptation and individuation processes after psychosis. Moderate reflective functioning associated with positive adjustment and successful individuation following psychosis. Impaired reflective functioning associated with unresolved adaptation and blocked individuation following psychosis.

Couture et al., 2007 (Canada)	Cross-sectional	96 (66.3% male, 33.7% female) Schizophrenia spectrum diagnosis, first episode of psychosis within past 2 years 23.7 (4.7)	Attachment Style Questionnaire	Insecure attachment styles more prevalent in psychosis sample that in non-clinical control sample. Males with psychosis more likely to report ambivalent or preoccupied styles; females more likely to report ambivalent or avoidant styles. Attachment avoidance and preoccupation related to poorer social functioning.
Dodwell et al., 2012 (UK)	Prospective cohort and cross-sectional	20 (60% male, 40% female) Mixed psychiatric in-patient sample (psychotic spectrum disorders n=15) 37 (median - mean and SD not reported, range 18-61)	Relationship Questionnaire	Greater agreement with preoccupied attachment classification associated with less improvement on mental health screening measure over period of changeover of junior psychiatric trainees. 75% of sample (n=15) chose description of insecure attachment style as most representative of themselves.
Donohoe et al., 2008 (Ireland)	Cross-sectional	73 (67% male, 33% female) Schizophrenia or schizoaffective disorder 41.4 (11.5)	Relationship questionnaire	Secure attachment style related to attributional style; specifically greater security associated with lower personalising bias scores and increased situational attributions.
Dozier & Lee, 1995 (USA)	Cross-sectional	76 (59% male, 41% female) Schizophrenia (n = 47), bipolar disorder (n = 27), panic disorder (n = 1), conversion disorder (n = 1)	AAI	Preoccupied attachment styles associated with more self-reported psychiatric symptoms than dismissing styles. Dismissing attachment styles associated with more clinician-rated psychiatric symptoms.

Dozier et al., 1994 (USA)	Cross-sectional	27 (78% male, 22% female) Schizophrenia (n = 16), bipolar disorder (n = 9), panic disorder (n = 1), conversion disorder (n = 1) 34 (SD not reported, range 23-47)	AAI	Preoccupied attachment styles associated with greater clinician-perceived dependency needs. Clinicians with insecure attachment styles perceive greater dependency needs and intervene in greater depth with patients with preoccupied attachment style compared with dismissive. Clinicians with preoccupied attachment style more likely to intervene in greater depth with patients than dismissing case managers.
Dozier et al., 2001 (USA)	Cross-sectional	34 (71% male, 29% female) Schizophrenia (n = 20), bipolar disorder (n = 14) 34 (SD not reported, range 21-46)	AAI	Dismissing attachment styles related to greater rejection of significant others, but not of case managers, in interpersonal interactions. Dismissing styles related to less time spent on task with case manager.
Kvrgic et al., 2011 (Switzerland)	Cross-sectional	127 (66% male, 44% female) Schizophrenia (n=90), schizoaffective disorder (n=37) 44.6 (11.53)	PAM (German version)	Significantly higher levels of attachment anxiety compared with attachment avoidance in sample. Attachment avoidance associated with higher levels of positive symptoms, poorer therapeutic relationship and higher levels of depression. Attachment anxiety associated with greater treatment adherence and higher levels of depression. Attachment anxiety independent predictor of depression.
MacBeth et al., 2011 (UK)	Cross-sectional	34 (58% male, 42% female) Psychotic disorder (first episode within last 12 months) Mean age not reported.	Adult Attachment Interview (AAI)	Higher proportion of dismissing attachment classifications compared to non-clinical sample and higher proportion of secure classifications compared to sample with chronic mental health difficulties. Secure and preoccupied attachment classifications associated with higher reflective functioning capacity compared with dismissing styles. Secure attachment classifications associated with better engagement with services and better treatment adherence.

Mulligan & Lavender, 2010 (UK)	Cross-sectional	73 (75% male, 25% female) Experienced symptoms commonly associated with psychosis (hallucinations, delusions, cognitive problems) Males 39 (10.49); females 48.6 (14.50)	Attachment Style Questionnaire (ASQ)	Lower levels of attachment security and higher levels of insecurity compared to normative sample. Associations between perceptions of parents being uncaring and over-protective and dimensions of attachment insecurity (larger effects for females). Some gender differences on dimensions of attachment insecurity.
Owens et al., 2012 (UK)	Cross-sectional	49 (86% male, 14% female) Schizophrenia (n=41), schizoaffective disorder (n=3), psychosis not otherwise specified (n=5) 38.06 (11.55)	PAM	Attachment anxiety and avoidance associated with global emotion regulation difficulties and specific domains of difficulty. Association between global emotion regulation difficulties and poorer therapeutic alliance. Attachment anxiety and therapeutic alliance significant predictors of emotion regulation.
Picken et al., 2010 (UK)	Cross-sectional	110 (90% male, 10% female) Schizophrenia or related psychosis 38 (median – mean and SD not reported, range 18-61)	PAM	Attachment anxiety associated with total number of traumatic events, interpersonal trauma and severity of PTSD symptomatology. Discrepancies between prevalence of trauma self-reported and reported by clinicians, with patients self-reporting significantly more traumatic events.
Ponizovsky et al., 2007 (Israel)	Cross-sectional	30 (100% male) Schizophrenia 38.4 (10.2)	Adult Attachment Styles	Patients significantly more likely to avoidant and anxious attachment styles and less likely to report secure attachment style than non-clinical control sample. Attachment anxiety and avoidance associated with more severe positive symptoms. Attachment avoidance associated with more severe negative symptoms. Insecure attachment styles associated with younger age of onset and longer hospitalization.
Tait et al., 2004 (UK)	Prospective cohort and cross-sectional	50 (62% male, 38% female) Schizophrenia or related disorders 33.8 (12.0)	Revised Adult Attachment Scale (RAAS)	Attachment anxiety associated with sealing-over recovery style and poorer engagement with services. Attachment anxiety associated with low parental care and abuse.

Tyrrell et al., 1999 (USA)	Cross-sectional	54 (41% male, 59% female) Schizophrenia (n = 31), schizoaffective disorder (n = 9), bipolar disorder (n = 8), major depression (n = 6) 41 (SD not reported, range 25-62)	AAI	Interactions between patient and case manager attachment styles – patients with more dismissive attachment styles had better working alliances with less dismissive case managers and reported greater life satisfaction; patients with less dismissive attachment styles had better working alliances with more dismissive case managers.
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Appendix B

Table 1.2: Quality criteria ratings for studies (presented alphabetically)

Reference	Representative sample	Measure of adult attachment style used	Reporting of attachment styles found in sample	Additional measures used	Potential confounding factors addressed	Study power	Methods of analysis	Generalisability, limitations and implications clearly discussed	Overall score out of 16
Arbuckle et al., 2012	Well-covered	Well-covered	Adequately addressed	Well-covered	Adequately addressed	Not reported	Well-covered	Well-covered	12
Berry et al., 2008	Well-covered	Well-covered	Not reported	Well-covered	Well-covered	Not reported	Well-covered	Well-covered	12
Berry et al., 2009	Well-covered	Well-covered	Not reported	Well-covered	Well-covered	Not reported	Well-covered	Well-covered	12
Berry et al., 2007	Well-covered	Well-covered	Not reported	Well-covered	Not addressed	Not reported	Well-covered	Well covered	12
Berry et al., 2010	Well-covered	Well-covered	Not reported	Not applicable	Adequately addressed	Not reported	Well-covered	Well covered	9
Berry et al., 2012	Well-covered	Well-covered	Not reported	Well-covered	Well-covered	Not reported	Well-covered	Well-covered	12
Blackburn et al., 2010	Adequately addressed	Well-covered	Adequately addressed	Well-covered	Well-covered	Not reported	Well-covered	Well-covered	12
Braehler & Schwannauer, 2012	Well-covered	Well-covered	Not reported	Well-covered	Adequately addressed	Not applicable	Well-covered	Well-covered	11
Couture et al., 2007	Well-covered	Well-covered	Well-covered	Well-covered	Well-covered	Not reported	Adequately addressed	Adequately addressed	12
Dodwell et al., 2012	Poorly addressed	Adequately addressed	Adequately addressed	Adequately addressed	Poorly addressed	Not reported	Adequately addressed	Adequately addressed	5
Donohoe et al., 2008	Well-covered	Adequately addressed	Not reported	Well-covered	Well-covered	Not reported	Well-covered	Well-covered	11
Dozier & Lee, 1994	Adequately addressed	Well-covered	Well-covered	Well-covered	Adequately addressed	Not reported	Adequately addressed	Well-covered	11
Dozier et al., 1994	Adequately addressed	Well-covered	Not reported	Adequately addressed	Adequately addressed	Not reported	Well-covered	Adequately addressed	8

Reference	Representative sample	Measure of adult attachment style used	Reporting of attachment styles found in sample	Additional measures used	Potential confounding factors addressed	Study power	Methods of analysis	Generalisability, limitations and implications clearly discussed	Overall score out of 16
Dozier et al., 2001	Adequately addressed	Well-covered	Not reported	Adequately addressed	Well-covered	Not reported	Well-covered	Adequately addressed	9
Kvrgic et al., 2011	Well-covered	Well-covered	Well-covered	Well-covered	Well-covered	Not reported	Well-covered	Well-covered	14
MacBeth et al., 2011	Well-covered	Well-covered	Well-covered	Well-covered	Well-covered	Not reported	Well-covered	Well-covered	14
Mulligan & Lavender, 2010	Adequately addressed	Well-covered	Adequately addressed	Well-covered	Well-covered	Adequately addressed	Well-covered	Well-covered	13
Owens et al., 2012	Well-covered	Well-covered	Not reported	Well-covered	Well-covered	Not reported	Well-covered	Well-covered	12
Picken et al., 2010	Well-covered	Well-covered	Not reported	Well-covered	Adequately addressed	Not reported	Well-covered	Well-covered	11
Ponizovsky et al., 2007	Well-covered	Adequately addressed	Well-covered	Well-covered	Adequately addressed	Not reported	Well-covered	Well-covered	12
Tait et al., 2004	Well-covered	Well-covered	Not reported	Well-covered	Well-covered	Not reported	Well-covered	Well-covered	12
Tyrrell et al., 1999	Adequately addressed	Well-covered	Not reported	Well-covered	Adequately addressed	Not reported	Well-covered	Well-covered	10

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Chapter 2: Research aims & hypotheses

2.1 Aims

As established by the systematic literature review, adult attachment style is a clinically relevant individual difference variable in the understanding of psychosis and has been associated with a range of outcome variables. The principal objective of the present study is to further understand the role of adult attachment style in emotional recovery in psychosis using a cross-sectional design. The study will investigate relationships between individuals' attachment style as adults and levels of depression and symptom-related distress. Interpersonal functioning and emotion regulation will also be investigated in terms of their relationships with attachment style and emotional distress. Specific hypotheses are outlined below.

2.1.1 Hypothesis 1

It is hypothesised that higher levels of attachment anxiety and avoidance will be positively correlated with levels of depression and symptom-related distress.

2.1.2 Hypothesis 2

It is hypothesised that greater degrees of attachment anxiety and avoidance will be positively associated with higher levels of interpersonal problems and more emotion regulation difficulties (specifically more use of expressive suppression as a strategy and less use of cognitive reappraisal).

2.1.3 Hypothesis 3

It is hypothesised that interpersonal problems and emotion regulation will mediate the relationships between attachment anxiety and avoidance and levels of depression and symptom-related distress.

Chapter 3: Methodology

3.1 Design

The study utilised a within group, cross-sectional, quantitative design. Data were collected via self-report questionnaires and a semi-structured clinical interview which informed completion of clinician rated measures. Demographic information was also collected from participants and information on participants' primary diagnosis was obtained by the researcher from psychiatric case notes.

3.2 Participants

3.2.1 Eligibility criteria

Principal inclusion criteria for the study were individuals who had experienced one or more episodes of psychosis, were receiving outpatient care from the Community Mental Health Service within NHS Tayside, were able to provide informed consent to participate, and were aged between 18 and 65 years. Principal exclusion criteria were individuals where psychosis was secondary to head injury or organic genesis, in receipt of inpatient care within the 3 month period prior to participation, unable to provide informed consent to participate, diagnosed with a learning disability, or who presented with risk issues such that they could not be interviewed by the researcher alone.

In terms of the definition of psychosis used for recruitment to the study the complaint-oriented approach proposed by Bentall (2003, 2006) was considered. This identifies psychosis on the basis of experience of psychotic symptomatology, such as hallucinations or delusions, rather than diagnosis alone, citing the controversy regarding the reliability and validity of the diagnostic classification system. It has been suggested that this is an appropriate criteria for conducting research into psychosis (Bentall, 2009).

3.2.2 Recruitment

Participants were recruited from the Community Mental Health Services in Dundee city and Angus. The researcher presented information regarding the aims and protocol of the study to Community Mental Health Service staff groups in order to enable staff to identify potential participants and to ensure accurate communication regarding the study to

potential participants. Potential participants were identified by Community Mental Health Service staff from review of current caseloads and subsequently approached by a clinician from the team known to them. Potential participants who expressed an interest at this initial stage were provided with a Participant Information Sheet (see Appendix B) and invited to provide contact details in order that the researcher could contact them to provide further information and establish whether they would like to participate. If willing to take part, an appointment was made with the participant for the purposes of data collection.

3.3 Procedure

Following recruitment by a member of staff from the Community Mental Health Service participants attended a one-off appointment with the researcher. This was either at a local Community Mental Health Service premises familiar to the participant, or at their own home where this was appropriate and preferred. Following the process of obtaining informed consent (see Appendix C for Participant Consent Form), participants completed a demographic information sheet and three self-report questionnaires. The researcher completed the self-report questionnaires with participants by conveying the information verbally where this was requested, for example where participants had literacy issues. Appointments typically lasted between 45 and 60 minutes although in some cases were longer, for example where written information was provided verbally.

3.4 Measures

3.4.1 Demographic information

Demographic information was also collected regarding participants' gender, age, relationship status, ethnicity, postcode, age of onset of psychosis and current medication. Time since onset was calculated by subtracting self-reported age of onset from current age to provide an estimation of chronicity of illness. Postcodes were recorded in order to identify the associated deprivation index category by means of the Scottish Index of Multiple Deprivation (SIMD; Scottish Government, 2009). The SIMD rates areas over 7 aspects of deprivation to derive an overall score between 1 and 10, where 1 indicates the most deprived areas in Scotland and 10 the least deprived. Ethnicity categories were presented as per classifications recommended by the Scottish Government (2008).

Participants' most recent primary psychiatric diagnoses were obtained by the researcher from medical records. Please see Appendix D for demographic information sheet.

3.4.2 Psychosis Attachment Measure (PAM; Berry, Wearden, Barrowclough & Liversidge, 2006)

The PAM is a 16-item self-report questionnaire designed to assess current attachment style in individuals with psychosis (Berry *et al.*, 2006). Items refer to thoughts, feelings and behaviours in close interpersonal relationships and participants are asked to rate how much each item is characteristic of themselves using a 4-point Likert scale ranging from 'not at all' to 'very much'. The PAM was specifically developed to provide a reliable and valid self-report measure of attachment style for use with individuals with psychosis (Berry *et al.*, 2006). Unlike most measures of attachment style in adulthood the PAM does not refer specifically to romantic relationships, thus acknowledging that individuals who have psychosis are often socially isolated and therefore questions relating to romantic attachments may have less relevance in this population (Berry *et al.* 2006). Participants are instead asked to consider how they relate to 'key people' in their lives, and the measure specifies that examples of key people could include family members, friends, partners or mental health workers. The PAM was also developed to take into consideration cognitive problems associated with long-term psychosis which may mean that individuals find it difficult to understand negatively worded items or wide-ranging response scales (Berry *et al.*, 2006). See Appendix E for a copy of the PAM and scoring guidelines.

The theoretical foundations of the PAM lie in the Bartholomew (1990) model of attachment which categorises attachment styles according to levels of anxiety and avoidance in relationships. Thus the measure yields two scores – one for anxiety and one for avoidance. Internal consistency and validity of the two factor structure of the measure has been confirmed using factor analysis (Berry *et al.*, 2006; Berry, Barrowclough & Wearden, 2008). The PAM has been shown to have good construct and concurrent validity through significant medium to large correlations with an existing, well-established measure of adult attachment style and significant positive associations with measures of interpersonal problems and self-esteem (Berry *et al.*, 2006; Berry *et al.*, 2008). It has good reliability with Cronbach's alphas of .83 for the anxiety sub-scale and .78 for the avoidance sub-scale in a clinical population (Berry, Barrowclough & Wearden, 2009).

3.4.3 Inventory of Interpersonal Problems (32-item version - IIP-32; Barkham, Hardy & Startup, 1996)

The IIP-32 was developed as a more clinically practical alternative to the original 127-item Inventory of Interpersonal Problems on which it is based, and is a self-report questionnaire featuring 32 items designed to identify and assess difficulties people may have in interpersonal relationships (Barkham *et al.*, 1996). The IIP is based on the theoretical assumption that significant interpersonal experiences give rise to cognitive and emotional representations, which in turn continue to influence behaviour, thoughts and feelings in interpersonal relationships (Horowitz, Alden, Wiggins & Pincus, 2000). The measure consists of 8 scales in order to identify the primary areas of an individual's interpersonal difficulties; namely domineering/controlling, vindictive/self-centred, cold/distant, socially inhibited, non-assertive, overly accommodating, self-sacrificing and intrusive/needy. The IIP-32 has good reliability with Cronbach's alphas for the sub-scales ranging from .68-.87 with an overall alpha coefficient of .93 for the total scale (Horowitz *et al.*, 2000). Test-retest reliability coefficient for the measure has been found to be .70 (Barkham *et al.*, 1996). The IIP-32 has achieved a Cronbach's alpha of .85 in a sample of participants with psychosis (Berry *et al.*, 2008). See Appendix F for a copy of IIP-32.

3.4.4 Emotion Regulation Questionnaire (ERQ; Gross & John, 2003)

The ERQ is a 10-item self-report questionnaire designed to assess individual differences in the habitual use of two emotion regulation strategies; namely cognitive reappraisal and expressive suppression (Gross & John, 2003). Cognitive reappraisal is a form of emotional regulation whereby an individual modifies their thoughts about an emotional situation in order to change its emotional impact. Expressive suppression refers to emotional regulation through inhibition of the expression of emotion once it has been triggered. The ERQ asks individuals to consider their emotional life and how they control emotions, by rating to what extent they agree or disagree with statements relating to their emotional experience using a 7-point Likert scale. Data from an analogue sample has shown the ERQ to have good internal reliability, with Cronbach's alphas of .79 for the reappraisal subscale and .73 for the suppression subscale (Gross & John, 2003). See Appendix G for a copy of the ERQ with scoring guidelines.

3.4.5 The Calgary Depression Scale for Schizophrenia (CDSS; Addington, Addington & Schissel, 1990)

The CDSS is a 9-item clinician rated measure specifically designed to assess depression in individuals with psychosis without interference from negative symptoms or extra-pyramidal side-effects of medication (Addington *et al.*, 1990). The measure consists of items assessing depressed mood, hopelessness, self-depreciation, guilty ideas of reference, pathological guilt, morning depression, early wakening, suicidal ideation and observed depression – with each item rated on a 4-point scale anchored by descriptors. It has good construct validity, with strong correlations found between the CDSS and existing well-established measures of depression (including the Beck Depression Inventory; Addington, Addington, Maticka-Tyndale & Joyce, 1992). It has high inter-rater reliability and a Cronbach's alpha of .79 (Addington *et al.*, 1992). The CDSS has been found to be superior to other measures of depression (including the depression subscale of the PANSS) in assessing depression above and beyond other psychopathology and extra-pyramidal side-effects in individuals with psychosis (Collins, Remington, Coulter & Birkett, 1996; Kim, Kim, Yoon, Kim, Shin, Hwang *et al.*, 2006). A cut-off score of greater than 6 points is generally accepted to detect the presence of a major depressive episode with 82% specificity and 85% sensitivity (Addington *et al.*, 1993). See Appendix H for a copy of the interview questions and scoring sheet for the CDSS.

3.4.6 Psychotic Symptom Rating Scales (PSYRATS; Haddock, McCarron, Tarrier & Faragher, 1999)

The PSYRATS comprises 17 clinician-rated items which assess attitudes and levels of distress associated with symptoms, as well as presence, frequency and duration of psychotic symptomatology (Haddock *et al.*, 1999). It consists of two subscales – auditory hallucinations and delusional beliefs. Inter-rater reliability is excellent, with reliability coefficients reported to be generally above .9 (Haddock *et al.*, 2009) and good concurrent validity with the PANSS has been found (Gottlieb *et al.*, 2009). Due to the focus on the emotional and functional impact of psychotic symptoms the PSYRATS is widely used in evaluating outcomes in cognitive behavioural therapy for psychosis (Gottlieb *et al.*, 2009). It is suggested that the PSYRATS is used alongside a global symptom scale in assessing outcomes in psychosis (Gottlieb *et al.*, 2009).

For the purposes of the current study 3 items only from the PSYRATS were administered in order to prevent unwarranted replication with the PANSS measure. These 3 items assess the amount of distress, intensity of distress and disruption to life caused by psychotic symptoms, and were rated on a 5-point anchored scale. See Appendix I for selected item from the PSYRATS.

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

The PANSS is a standardised assessment tool for assessing clinical outcome in psychotic disorders and is considered to be the gold-standard scale in this area (Gottlieb, Fan & Goff, 2009). The PANSS ratings are completed by the interviewing clinician based on a semi-structured interview assessment of mental state. It contains 30 items across 3 sub-scales – 7 items covering positive symptoms, 7 items covering negative symptoms and 16 items assessing general psychopathology, including depressed mood and anxiety. For the purposes of the current study only the 14 items assessing positive and negative symptoms were rated in order to avoid unnecessary duplication with the Calgary Depression Scale for Schizophrenia. The PANSS has excellent criterion and construct validity and high inter-rater and split-half reliability (both .80; Gottlieb *et al.*, 2009). See Appendix J for a scoring sheet for the PANSS.

In order to establish inter-rater reliability on this measure, the researcher completed a training exercise involving rating patient interviews recorded on DVD and comparing scores to those given by the original interviewer. Two training interviews were conducted by the authors of the measure and following the rating process the actual scores as rated by the original interviewer were outlined and guidance was given regarding the evidence for awarding the given ratings. Four additional sample interviews were provided by the Birmingham Early Intervention Service. The scores as rated by the researcher on these interviews were submitted to a research supervisor who is trained and highly experienced in using the PANSS (M. Schwannauer), who compared these to the scores as rated by the original interviewer. After the first rating some disparities remained between the researcher's ratings and the original ratings; therefore following general discussion of the rating process with the research supervisor the interviews were re-rated. Adequate inter-rater reliability was established from this process. In order to maintain methodological rigour a sample of interviews with participants in the current research were also recorded (with participant consent) and submitted to the research supervisor for co-rating.

3.5 Ethical considerations

3.5.1 Ethical considerations

As the study involved recruitment from a population of individuals with severe and enduring mental illnesses it was important to consider the potential vulnerability of this group and to safeguard participants. Potential participants were initially approached regarding participation in the study by a clinician from the Community Mental Health Team who was known to them. Care was taken to ensure that potential participants were advised throughout the process of recruitment and participation of their right to withdraw from the study at any point. All data were collected by the researcher - who has prior experience of working therapeutically with individuals who have experienced psychosis and other severe and enduring mental health difficulties - in person as this was considered the most appropriate method when conducting research with a potentially vulnerable group.

Consideration was given to the potential for the process of participation to cause distress to participants. Assessment of mental state and current symptoms is a principal component of routine care carried out by Community Mental Health Service staff and thus it was deemed that this aspect of the study would be familiar to participants and would not cause undue distress. The questionnaires utilised in the study had all been used in research with individuals with psychosis prior to the current study with no adverse effects reported. The use of such questionnaires is common practice in psychological research and clinical practice and therefore the risk of undue distress to participants was judged to be low. However research protocol specified that should a participant become distressed by participation in the study they would be offered the opportunity to take a break or to withdraw completely, and would be advised of and encouraged to use the Community Mental Health Teams Duty Worker system, whereby a member of staff is always available during working hours to offer support and advice to patients when needed. A risk management pathway was developed as part of the project protocol to ensure appropriate management of situations where a participant may have disclosed a degree of risk to the participant or to another individual. This pathway entailed timely and effective communication of the risk issues to professionals involved in the individual's care and implementation of relevant local adult and child protection procedures where necessary.

Appropriate measures were taken to ensure that informed consent was granted by participants, and that anonymity of participants' data was protected and the data were stored securely.

3.5.2 Ethical approval

The East of Scotland Research Ethics Committee and Tayside Medical Science Centre Research and Development Office reviewed and approved the present study (see Appendix for ethics correspondence and approvals). The research proposal was also reviewed by a member of academic staff from the University Of Edinburgh School Of Health in Social Sciences who deemed it to be viable. Local approval for the study to proceed was sought and granted by the NHS Tayside Mental Health Services Clinical Management Forum. The East of Scotland Research Ethics Committee requested that the proposal be modified to include General Practitioners being informed of the participation of patients under their care in the study. The Participant Information Sheet and Consent Form were amended to reflect this. The East of Scotland Research Ethics Committee also recommended that the researcher attended Good Clinical Practice Training which was subsequently undertaken. See Appendix K for copies of ethics correspondence and approval letters.

3.6 Statistical analyses

3.6.1 Sample size and power calculations

Statistical power refers to the probability of detecting an effect where it exists and of avoiding a Type II statistical error, whereby the research hypothesis is incorrectly rejected (Clark-Carter, 2010). Prospective power analyses were conducted, according to the recommendations that follow, in order to estimate the sample size required to ensure the methodological integrity of the present study. In terms of significance criterion, an alpha (α) level of .05 is generally recommended in behavioural sciences research in order to reduce the risk of committing a Type I error, whereby the null hypothesis is mistakenly rejected (Cohen, 1992). Where the likelihood of committing a Type II error is beta (β), the power of a test is equal to $1 - \beta$ (Clark-Carter, 2010). It is generally recommended that a minimum power level of .8 should be aimed for in psychological research (Clark-Carter, 2010). It is useful for the researcher to gain an impression of the probable effect sizes to be found in the current research by reviewing the effect sizes already found in the area of interest

(Clark-Carter, 2010). These recommendations were adhered to in calculating power for the present research.

Previous research using this study's primary independent variable (adult attachment style as assessed by the Psychosis Attachment Measure (PAM)) has reported medium to large correlations (.28 and .57 for attachment anxiety and avoidance respectively) between the PAM and the Inventory of Interpersonal Problems (32-item version) which is also used in the present study (Berry, Wearden & Barrowclough, 2007). Medium correlations have also been reported between the PAM and the CDSS ($r = .37$, $r = .41$ respectively) Blackburn, Berry & Cohen, 2010; Arbuckle, Berry, Taylor & Kennedy, 2012). Therefore, on the basis of previous research findings in this area, this study expects to find medium sized correlations between independent and dependent variables.

Cohen's power primer method (1992) suggests that in order to have .8 power to detect medium effect sizes at an alpha level of .05 when carrying out a multiple regression/correlation analysis with three independent variables, a sample size of 76 is required. A calculation was also carried out (using the same criteria as above) based upon Green's (1991) formula for determining the number of participants required to conduct a multiple regression analysis. Using this method the required sample size is $50 + 8m$, where m equals the number of independent variables, and for this study suggests that the sample size should be 74 or greater in order to achieve sufficient power. Although the methods used to test for mediation effects (see below) employ the re-sampling technique of bootstrapping and are thus less stringent with regard to specific sample sizes, larger samples are recommended to ensure that analyses are based on data representative of the population and to improve reliability of results (Preacher & Hayes, 2013). Therefore the study aimed to recruit approximately 70-80 participants.

3.6.2 Data screening

Data were analysed using IBM SPSS Statistics Version 19. The computational and modelling tool PROCESS (Hayes, 2013) for SPSS was utilised in mediation analyses. Prior to statistical analyses data sets were screened to establish that assumptions for further analyses were met.

3.6.2.1 Missing data

One participant did not complete the ERQ and therefore their data were excluded from analyses using this measure as recommended by Tabachnick and Fidell (2013).

3.6.2.2 Distribution of data

Box-plots were examined to establish that no outliers were biasing the dataset. Linearity and homoscedasticity were investigated using bivariate scatterplots for all variables of interest and plotting standardized predicted values against standardized residuals (Field, 2013; Tabachnick & Fidell, 2013). Linear relationships and homoscedasticity (i.e. relative homogeneity in variability in scores across variables) were indicated. The distribution of data in the sample was explored using in relation to skewness and kurtosis. Skewness is a measure of symmetry in distribution and kurtosis refers to the spread of scores (Clark-Carter, 2010). Values of skew and kurtosis were converted to z-scores to establish whether the assumption of normality of distribution was violated (Field, 2013). Conservative alpha levels of .01 are recommended to evaluate the significance of skewness and kurtosis in small to moderate samples (Tabachnick & Fidell, 2013). All z-scores for variables of interest were non-significant at $p < .01$ ($z < 2.58$, see Appendix L) indicating that normality of distribution can be assumed.

3.6.2.3 Multicollinearity

Multicollinearity exists when strong associations are present between independent variables which can lead to difficulties in interpreting results as the relative importance of predictors cannot be differentiated (Clark-Carter, 2010). High correlations ($> .80$) suggest multicollinearity. Bivariate correlations were conducted to assess collinearity of independent variables. All correlations were less than .80 suggesting that collinearity is not a problem. As this method of screening can fail to identify more subtle forms of multicollinearity however, further collinearity statistics were examined. The variance inflation factor (VIF) indicates whether an independent variable has a strong linear relationship with other independent variables (Field, 2013). The tolerance statistic is the reciprocal of the VIF (i.e. $1/VIF$) and indicates the proportion of the independent variable not predicted by other independent variables in the model (Clark-Carter, 2010). VIF values should be less than 10 and tolerance values greater than .2 to establish that multicollinearity is not problematic (Field, 2013). In addition the average VIF should not be

substantially greater than 1. All VIF values were less than 10 and all tolerance values were greater than .2 (see Appendix L). The average VIF was not substantially larger than 1 (1.453). Therefore screening of the data suggests that multicollinearity is not significantly biasing the results of further analyses.

3.6.2.4 Covariance with demographic or illness-severity variables

To determine whether any demographic or illness-severity variables should be considered as covariates in further analyses, associations between these and independent and dependent variables were investigated. Previous research has found significant relationships between attachment styles and positive and negative psychotic symptomatology (Berry *et al.*, 2008; Kvirgic *et al.*, 2011; Ponizovsky *et al.*, 2007; Tait *et al.*, 2004). Gender differences in attachment style in samples with psychosis have also been reported (Berry *et al.*, 2008; Mulligan & Lavender, 2010). Considering the often chronic course of illness in samples of people with psychosis and the effects this could have on attachment style and interpersonal functioning, age and chronicity variables were also examined. Bivariate correlations were conducted between dependent variables (CDSS and PSYRATS) and age, age of onset, time since onset and PANSS positive and negative symptom totals, and with independent variables (PAM anxiety and avoidance, IIP-32 and ERQ suppression and reappraisal). Symptom-related distress as measured by the PSYRATS was significantly correlated with the PANSS positive symptoms scale ($r=.337, p=.004$) which was therefore included as a covariate in mediation analyses involving the PSYRATS. No other significant associations with demographic or illness-related variables were found (see Appendix L for correlation matrix). An independent-samples t-test was conducted in order to establish any gender differences on independent and dependent variables. No differences were found on any independent or dependent variables (see Appendix L) and therefore gender was not included as a covariate in any further analysis.

3.7 Methods of analysis

Bivariate correlations using Pearson's product-moment coefficients were used to initially explore the relationships between the independent and dependent variables as assumptions for parametric statistics were met. Mediation analyses using the re-sampling technique of bootstrapping were then carried out to further investigate the nature of these

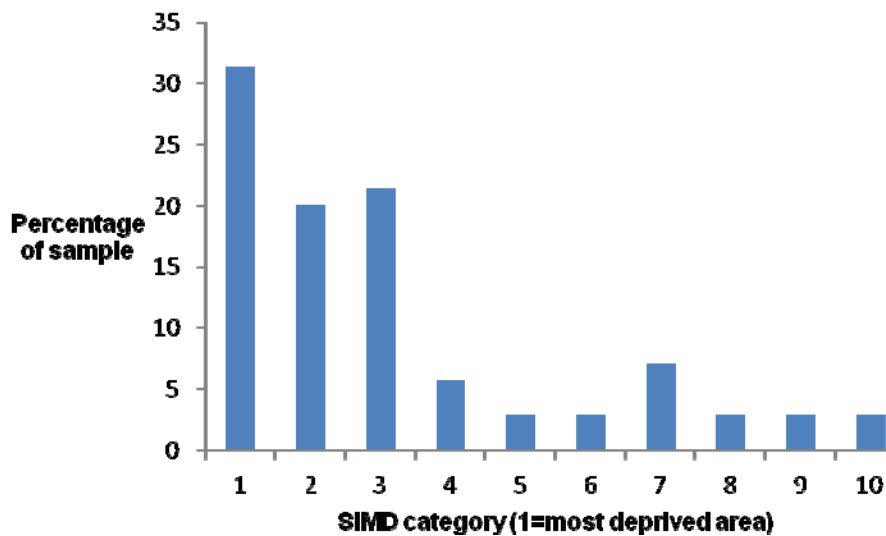
relationships. Mediation effects have traditionally been assessed using the causal steps methodology outlined by Baron and Kenny (1986). However this approach has been criticised due to low power increasing the chances of Type II errors and lack of quantification of the intervening effect resulting in likelihood of Type I errors (Hayes, 2009; Preacher & Hayes, 2013). An alternative methodology for assessing mediation is based on the re-sampling technique known as bootstrapping which creates an empirical estimation of the distribution of the population based the data in the sample (Hayes, 2009). This bootstrap sample is then used to infer the size and direction of the indirect effect based on a bias-corrected confidence interval (BC CI) at a specified level of confidence. If the upper and lower bounds of the BC CI do not contain zero a significant mediation effect can be assumed. Hayes (2009) recommends at least 5000 bootstrap samples and a confidence interval of 95 per cent. Using these parameters therefore if the BC CI does not contain zero a significant effect can be assumed with 95 per cent confidence. Bootstrapping as an approach to testing mediation has been reported to be superior to alternative methods in terms of power and Type I error rates (MacKinnon, Lockwood & Williams, 2004) and was therefore deemed the appropriate method of analysis in this study. It has been recommended that at least one measure of effect size is reported alongside BC CI in mediation analysis (Preacher & Kelley, 2011). Therefore the value of Kappa-squared (k^2), a standardized and bounded measure of effect size, was interpreted in the current study alongside an index of the explained variance (R^2).

3.8 Sample characteristics

The mean age of participants was 43.8 years (SD=10.6, range 21-66). The majority of participants (68.6%, n=48) were male and 31.4% (n=22) were female. The mean age of onset of psychosis was 24.8 years (SD=10.4, range 8-58) and the mean time since onset was 18.8 years (SD=10.7, range 2-54). The majority of participants were White Scottish, English or British in ethnicity (94.3%, n=66). 1.4% (n=1) identified as being from mixed/multiple ethnic groups, 1.4% (n=1) as Pakistani, Pakistani Scottish or British, 1.4% (n=1) as Indian, Indian Scottish or British and 1.4% (n=1) as Bangladeshi, Bangladeshi Scottish or British.

The majority of participants (72.8%, n=51) lived within the three most deprived categories according to the SIMD. Figure 3.1 illustrates the percentages of the sample identified as living in each SIMD category.

Figure 3.1: Percentages of sample living in each SIMD category (1=most deprived area, 10=least deprived).



The largest proportion of participants (62.9%, n=44) identified themselves as single, with 25.7% (n=18) identifying as in a relationship or married and 11.4% (n=8) as divorced. The majority of the sample had a primary diagnosis of schizophrenia (61.4%, n=43), with 11.4% (n=8) having a diagnosis of schizoaffective disorder, 11.4% (n=8) bipolar affective disorder, 7.1% (n=5) unspecified psychotic disorder, 5.7% (n=4) depression with psychotic features, 1.4% (n=1) anxiety disorder and 1.4% (n=1) emotionally instable personality disorder. Diagnoses were recorded from the last psychiatric diagnosis recorded in medical records. Although not all current diagnoses in the sample are of primary psychotic disorders, it was confirmed with referrers that all participants had previously received a primary diagnosis of a psychotic illness. Only 34.3% (n=24) of participants reported taking only one type of psychotropic medication (20.0% (n=14) reported taking typical anti-psychotics, 85.7% (n=60) atypical antipsychotics, 18.6% (n=13) mood stabilizers, 47% (n=33) antidepressants and 12.9% (n=9) anxiolytics or hypnotics). Using the recommended cut-off of a total of 6 on the CDSS, 51.4% (n=36) of the sample met criteria for clinical depression.

Chapter 4: Empirical study¹

4.1 Title page²

Title: Understanding the role of adult attachment style in emotional distress in psychosis: investigating interpersonal problems and emotion regulation as possible mediators.

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²Numbering of titles is included throughout for continuity of thesis but would not be included for submission. Tables are inserted into the text for ease of reading but would be presented at the end of the text for submission.

4.2 Abstract

Attachment theory – a developmental framework which proposes that early relationship experiences have an enduring effect on interpersonal relations, affect regulation and psychological functioning throughout life – has been implicated in the understanding of emotional distress in psychosis. Using a cross-sectional design the current study aimed to investigate the associations between adult attachment style, emotional distress, interpersonal problems and emotion regulation in 70 individuals who have experienced psychosis. Adult attachment style was measured using the Psychosis Attachment Measure (PAM) to assess attachment along dimensions of anxiety and avoidance. Interpersonal problems and emotion regulation were assessed using self-report questionnaires and clinician-rated measures of depression and symptom-related distress were administered. Predicted associations between insecurity in adult attachment and greater emotional distress were supported and higher levels of attachment insecurity were also associated with more interpersonal problems and greater use of expressive suppression as an emotion regulation strategy. Interpersonal problems significantly mediated the relationship between attachment insecurity and emotional distress. The hypothesised mediating role of emotion regulation was not supported. Findings suggest that insecurity in adult attachment style is an important variable in understanding emotional distress in individuals with psychosis and that difficulties in interpersonal functioning, as a mediating factor in this relationship, may represent a useful focus in psychological treatments with this population.

4.2.1 Keywords

Schizophrenia, depression, social functioning, relationship style.

4.3 Introduction

Attachment is proposed to be an organisational system for understanding and managing behavioural and affective responses in interpersonal relationships, which is based in early relationship experiences and influences relational style and interpersonal functioning throughout life via the development of internal representations, or working models, about the self and others.^{1,2} Where early experiences of relationships with caregivers have been consistently responsive to needs, a secure attachment style is developed characterised by positive internal working models regarding the self and others whereas inconsistent, neglectful, unresponsive or abusive early experiences can lead to insecure attachment style and negative beliefs regarding the self and/or others². Whilst early experiences are strongly implicated in the development of an enduring attachment style, later life experiences can also lead to revisions of attachment working models.¹ The attachment system is hypothesised to be activated in times of emotional distress and adult attachment style has been conceptualised as a framework for understanding affect, interpersonal functioning and psychopathology in adulthood.^{3,4,5} It has been proposed that adult attachment style can be understood along two dimensions. In cognitive terms these dimensions are conceptualised as model of self and model of others⁶ and it has been suggested that dimensions of attachment-related anxiety and avoidance are affective or behavioural equivalents of these.⁷ Attachment anxiety is associated with a negative model of self, overly demanding interpersonal style, fear of abandonment and high levels of negative affect. Attachment avoidance is characterised by a negative model of others, minimisation of affective responses, fear or avoidance of relying on others and social withdrawal.⁸ Analysis of measures of attachment style in adults has supported this two dimension understanding of attachment.⁹

Attachment theory has been conceptualised as a valuable framework for understanding the roles of interpersonal difficulties, psychological distress and social cognition in psychosis.¹⁰ Recent research has demonstrated the relevance of attachment insecurity in psychosis. High levels of attachment avoidance have been found in samples of individuals with psychosis^{11,12,13} and significant differences have been reported between individuals with psychosis and non-clinical control groups, with lower levels of attachment security and higher levels of insecurity found in psychotic samples.^{12,14,15} There is also evidence that attachment may be of particular relevance in psychosis as higher levels of attachment

insecurity have been reported in individuals with a diagnosis of psychosis compared with other major psychiatric diagnoses.^{16,17} Insecurity in adult attachment has been associated with higher levels of depression and symptom-related distress in individuals with psychosis.^{11,18,19,20}

Depression is prevalent amongst individuals with psychosis.²¹ Reports of the occurrence of depression as a co-morbidity of psychosis vary dramatically depending on diagnostic criteria and methods used to assess depressive symptoms and the acuteness and severity of the psychotic illness and estimates range from 7 to 75 per cent.²¹ Recent longitudinal research has estimated that approximately 80 per cent of individuals who experience an episode of psychosis will at some stage over the course of their illness develop a clinically significant depressive disorder.^{22,23} Depression has been associated with poorer outcomes in psychosis in multiple domains; including impaired functioning,²⁴ higher rates and longer duration of hospitalisation,^{25,26} increased risk of relapse,^{27,28} greater occupational impairment,²⁹ higher rates of substance misuse,²⁸ poorer family relationships,²⁸ and lower self-esteem and quality of life.^{24,28,30} Depression is also a significant predictor of risk of suicide in individuals with psychosis.^{31,32} Better understanding and treatment of depression presenting in the context of psychosis is clearly crucial in order to improve recovery outcomes for this group.

Interpersonal problems and impairments in social functioning are hallmarks of psychosis and are present from early in the course of illness.^{10,33} Significantly higher levels of interpersonal problems have been found in samples of people with psychosis compared with non-clinical groups³⁴ and impairments in social functioning have been implicated in poorer recovery in terms of global functioning, negative symptomatology and depression.^{35,36,37} Difficulties in interpersonal functioning in psychosis may be understood within an attachment framework as attachment styles are likely to influence individuals' interpersonal responses during the distressing experience of psychosis.³⁸ In a large, non-clinical sample interpersonal distancing – defined as difficulties in establishing and maintaining relationships – was associated with attachment insecurity and paranoia, acting as a mediator between these variables.³⁹ Associations between attachment insecurity and interpersonal problems have also been reported in a sample of individuals with psychosis, with specific links between attachment anxiety and overly demanding behaviour and attachment avoidance and interpersonal hostility.³⁸ Thus interpersonal problems are a

viable variable influencing the relationship between adult attachment style and emotional distress in the context of psychosis.

Emotion regulation encompasses a wide range of processes employed to influence affective experiences and expression using both conscious and unconscious, automatic and controlled, responses.⁴⁰ The formation of emotion regulation strategies has been conceptualised as a central element of attachment theory^{3,4} and associations between greater attachment insecurity and emotion regulation difficulties have been reported in individuals with psychosis.⁴¹ One model of emotion regulation proposes two components, namely cognitive reappraisal and expressive suppression.⁴² Cognitive reappraisal is a form of emotion regulation whereby an individual modifies their thoughts about a potentially emotion-eliciting situation in order to change its emotional impact and is conceptualised as an antecedent-focused strategy aimed at altering emotional response prior to it being fully activated. Expressive suppression refers to emotion regulation through inhibition of the expression of emotion once it has been triggered and thus is described as a response-focused strategy. Expressive suppression has been associated with fewer positive emotional experiences and greater negative emotional experience.^{42,43} Moreover suppression has been associated with higher prevalence of depressive symptoms, lower life satisfaction and poorer self-esteem.^{42,44,45} Findings regarding habitual use of reappraisal and suppression strategies in psychosis are conflicting. Greater use of suppression and lesser use of reappraisal by individuals with psychosis in comparison with non-clinical controls has been reported^{46,47} but other studies have found no differences between groups on the use of these strategies.^{44,45,48,49} More frequent use of reappraisal has been associated with better social functioning and lower levels of depression in individuals with psychosis^{44,47} whilst more use of expressive suppression has been found to relate to greater symptom severity and disruption to daily life.⁴⁵ Therefore whilst there is no consensus regarding variations in emotion regulation strategies in psychosis it may be a relevant concept in understanding depression in this group. Considering theoretical links emotion regulation is also potentially a pertinent factor in understanding the relevance of adult attachment style in psychosis.

Whilst research to date has demonstrated associations between insecurity in adult attachment style and higher levels of depression, symptom-related distress, interpersonal problems and difficulties in emotion regulation, to the author's knowledge no study to date

has investigated the inter-relationships between these variables. Mediation occurs when the relationship between two variables functions, in full or in part, through a third variable thus providing useful insight into the underlying mechanisms influencing the nature of the relationship.⁵⁰ Using the theoretical framework of adult attachment theory it is hypothesised that emotion regulation and interpersonal problems may act as clinically relevant psychological mechanisms which mediate the relationship between attachment insecurity and emotional distress.

The principal objective of the present study is to further understand the role of adult attachment style in emotional recovery in psychosis using a cross-sectional design. Firstly, the study will investigate the relationship between individuals' attachment style as adults and levels of depression and symptom-related distress. Specifically it is hypothesised that higher levels of attachment anxiety and avoidance will be positively correlated with levels of depression and symptom-related distress. Secondly, the study aims to investigate the relationships between attachment style, emotion regulation and interpersonal problems in individuals who have experienced psychosis. It is hypothesised that greater attachment anxiety and avoidance will be positively associated with more use of expressive suppression and less use of cognitive reappraisal as emotion regulation strategies, and with higher levels of interpersonal problems. Finally, the potential mediating roles of emotion regulation and interpersonal problems will be investigated. It is hypothesised that interpersonal problems and dimensions of emotion regulation will mediate the relationships between attachment anxiety and avoidance and levels of depression and symptom-related distress.

4.4 Method

4.4.1 Design

The study utilised a within group, cross-sectional, quantitative design. Based on prospective power calculations using Cohen's power primer method⁵¹ and Green's formula for multiple regression analyses⁵² the study aimed to recruit 70-80 participants in order to have 80 per cent power to detect a medium effect size at an alpha level of .05. Consideration was given to the safety and well-being of individuals participating in the study and the East of Scotland Research Ethics Committee and Tayside Medical Science Centre Research and Development Office reviewed and approved the study methodology.

4.4.2 Participants and procedure

Inclusion criteria for the study were individuals who had experienced one or more episodes of psychosis, were receiving out-patient care from the Community Mental Health Services in Tayside, able to provide informed consent to participate and over 18 years of age. Exclusion criteria were psychosis secondary to head injury or organic genesis, persons in receipt of in-patient care within the 3 month period prior to participation, learning disability, or significant risk issues such that they could not be interviewed by the researcher alone. An experience-driven rather than diagnostic approach was taken in relation to inclusion criteria, in line with recent controversy regarding the validity and reliability of psychiatric diagnoses.⁵³

Community mental health teams were informed about the study and staff were asked to provide potential participants with an information sheet. With patient permission the researcher then contacted participants to answer any questions and arrange a time to take part in the study. Data were collected during a one-off appointment with the researcher via self-report questionnaires and a semi-structured clinical interview which informed completion of clinician-rated measures. Medical records were reviewed to collect information regarding most recent primary psychiatric diagnosis. 70 participants were recruited from the Community Mental Health Services in Dundee city (n=67) and Angus (n=3).

4.4.3 Measures

4.4.3.1 Psychosis Attachment Measure (PAM)⁸

The PAM is a 16-item self-report questionnaire designed to assess adult attachment style in individuals with psychosis.⁸ Items refer to thoughts, feelings and behaviours in close interpersonal relationships and participants are asked to rate the extent to which they identify with each item using a 4-point Likert scale. The PAM does not refer specifically to romantic attachments thus acknowledging the prevalence of social isolation in people with psychosis.³⁸ The measure was also developed with sensitivity to cognitive problems associated with chronic psychosis.⁸ The theoretical foundations of the PAM lie in the Bartholomew model of attachment which categorises attachment styles according to levels of anxiety and avoidance in relationships.⁶ Thus the measure yields two scores – anxiety and avoidance. The PAM has demonstrated good reliability in clinical populations

(Cronbach's alphas of .83 for the anxiety sub-scale and .78 for the avoidance sub-scale¹⁹) and well-established construct validity.^{8,38.}

4.4.3.2 Inventory of Interpersonal Problems (32-item version – IIP-32)⁵⁴

The IIP-32 is a self-report questionnaire featuring 32 items designed to identify and assess difficulties people may have in interpersonal relationships.⁵⁴ The measure consists of 8 scales; namely domineering/controlling, vindictive/self-centred, cold/distant, socially inhibited, non-assertive, overly accommodating, self-sacrificing and intrusive/needy. It also yields an overall score for total interpersonal problems. The IIP-32 has good reliability with an alpha coefficient of .93 for the total scale⁵⁵ and .85 in a sample of participants with psychosis.³⁸

4.4.3.3 Emotion Regulation Questionnaire (ERQ)⁴²

The ERQ is a 10-item self-report questionnaire designed to assess individual differences in the habitual use of two emotion regulation strategies – cognitive reappraisal and expressive suppression.⁴² The ERQ asks individuals to rate to what extent they agree with statements relating to their emotional experience using a 7-point Likert scale. Data from an analogue sample has shown the ERQ to have good internal reliability, with Cronbach's alphas of .79 for the reappraisal subscale and .73 for the suppression subscale⁴² and .72 and .67 respectively in a sample of individuals with psychosis.⁴⁴

4.4.3.4 The Calgary Depression Scale for Schizophrenia (CDSS)⁵⁶

The CDSS is a 9-item clinician rated measure specifically designed to assess depression in individuals with psychosis without interference from negative symptoms or extra-pyramidal side-effects of medication and has been found to be superior to other measures of depression in this population.^{56,57,58.} The measure consists of items assessing depressed mood, hopelessness, self-depreciation, guilty ideas of reference, pathological guilt, morning depression, early wakening, suicidal ideation and observed depression – with each item rated on a 4-point scale anchored by descriptors. It has good construct validity, high inter-rater reliability and a Cronbach's alpha of .79.⁵⁹ A cut-off score of greater than 6 points is generally accepted to detect the presence of a major depressive episode with 82 per cent specificity and 85 per cent sensitivity.⁶⁰

4.4.3.5 Psychotic Symptom Rating Scales (PSYRATS)⁶¹

The PSYRATS assesses attitudes and levels of distress associated with symptoms, as well as presence, frequency and duration of psychotic symptomatology.⁶¹ It consists of two subscales – auditory hallucinations and delusional beliefs. Inter-rater reliability is excellent, with reliability coefficients reported to be generally above .9⁶² and good concurrent validity with the PANSS.⁶³ For the purposes of the current study 3 items only from the PSYRATS were adapted and administered to provide a measure of symptom-related distress. These 3 items assess the amount of distress, intensity of distress and disruption to life caused by psychotic symptoms, rated on a 3-point anchored scale.

4.4.3.6 Positive and Negative Syndrome Scale (PANSS)⁶⁴

The PANSS is considered to be the gold-standard scale for assessing clinical outcome in psychotic disorders.⁶³ It was included in the study to provide a measure of overall illness severity in terms of positive and negative symptoms of psychosis. The PANSS ratings are completed by the interviewing clinician based on a semi-structured interview assessment of mental state. It contains 30 items across 3 sub-scales – 7 items covering positive symptoms, 7 items covering negative symptoms and 16 items assessing general psychopathology. For the purposes of the current study only the 14 items assessing positive and negative symptoms were rated in order to avoid unnecessary duplication with the CDSS. The PANSS has excellent criterion and construct validity and high inter-rater and split-half reliability (both .80)⁶³ In order to ensure inter-rater reliability on this measure, the researcher completed training to establish rating reliability and a random sample of interviews were recorded (with participant consent) and second-rated by an experienced rater with good inter-rater agreement being achieved.

4.4.3.7 Demographic information

Demographic information was also collected regarding participants' gender, age, relationship status, ethnicity, postcode, age of onset of psychosis and current medication. Time since onset was calculated by subtracting age of onset from current age to provide an estimation of chronicity of illness. Postcodes were recorded in order to identify the associated deprivation index category by means of the Scottish Index of Multiple Deprivation.⁶⁵ The SIMD rates areas over 7 aspects of deprivation to derive an overall score between 1 and 10, where 1 indicates the most deprived areas in Scotland and 10 the least

deprived. Participants' most recent primary psychiatric diagnoses were obtained by the researcher from medical records.

4.4.4 Statistical analysis

Data were analysed using IBM SPSS Statistics Version 19. Prior to statistical analyses data sets were screened to establish that assumptions for multiple regression were satisfied. Pearson's correlations were used to initially explore the relationships between the independent and dependent variables. Mediation analyses using the re-sampling technique of bootstrapping were then carried out to further investigate the nature of these relationships. One participant did not complete the ERQ and therefore their data were excluded from any analysis using this measure.

4.5 Results

4.5.1 Sample characteristics

Demographic characteristics are detailed in Table 3.1. The mean age of participants was 43.8 years (SD=10.6). The mean age of onset of psychosis was 24.8 years (SD=10.4) and the mean time since onset was 18.8 years (SD=10.7). The majority of participants (72.8%, n=51) of participants lived within the three most deprived categories according to the SIMD. All participants reported taking at least one type of psychotropic medication and the majority (65.7%, n=46) of reported taking two or more types. Although most recent primary diagnoses recorded included non-psychotic disorders it was confirmed with referrers that all participants had previously been treated for clinically significant psychosis.

Table 3.1: Demographic characteristics

<i>Demographic variable</i>	<i>Percentage of sample (n)</i>
<i>Gender</i>	
Male	68.6% (48)
Female	31.4% (22)
<i>Diagnosis</i>	
Schizophrenia	61.4% (43)
Schizoaffective disorder	11.4% (8)
Bipolar affective disorder	11.4% (8)
Unspecified psychotic disorder	7.1% (5)
Depression with psychotic features	5.7% (4)
Anxiety disorder	1.4% (1)
Emotionally unstable personality disorder	1.4% (1)
<i>Ethnicity</i>	
White Scottish/English/British	94.3% (66)
Mixed/multiple ethnic groups	1.4% (1)
Pakistani, Pakistani Scottish or Pakistani British	1.4% (1)
Indian, Indian Scottish or Indian British	1.4% (1)
Bangladeshi, Bangladeshi Scottish or Bangladeshi British	1.4% (1)
<i>Relationship status</i>	
Single	62.9% (44)
Divorced	11.4% (8)
In a relationship or married	25.7% (18)
<i>Medication</i>	
Typical anti-psychotics	20% (14)
Atypical anti-psychotics	85.7% (60)
Mood stabilisers	18.6% (13)
Anti-depressants	47% (33)
Anxiolytics/hypnotics	12.9% (9)

Descriptive statistics for all variables are detailed in Table 3.2. Using the recommended cut-off of a total of 6 on the CDSS, 51.4% (n=36) of the sample met criteria for clinical depression. Using the method outlined by Kvrjic and colleagues¹¹ of calculating a difference score (anxiety-avoidance) on the PAM to identify whether participants demonstrated a predominantly anxious or avoidant attachment style, 61.4 per cent (n=43) of the sample had a higher avoidance score, 32.9 per cent a higher anxiety score and 5.7 per cent had no difference indicating no overall preference.

Table 3.2: Mean score, standard deviations and range of scores for all measures

<i>Variable</i>	N	Minimum	Maximum	Mean (SD)	<i>Range of scale</i>
PAM – anxiety	70	.13	2.88	1.35 (.72)	0-3
PAM – avoidance	70	.38	2.88	1.61 (.66)	0-3
ERQ – reappraisal	69	6	42	25.71 (8.85)	6-42
ERQ – suppression	69	4	28	17.67 (6.15)	4-28
IIP – total	70	37	86	60.03 (12.06)	36-89
CDSS – total	70	0	20	7.19 (5.66)	0-27
PANSS – positive symptoms	70	7	32	17.29 (6.25)	7-49
PANSS – negative symptoms	70	7	27	14.30 (5.48)	7-49
PSYRATS – total	70	0	9	3.56 (2.77)	0-12

4.5.2 Bivariate correlations

In order to establish whether any demographic or illness-severity variables should be considered as covariates in the analysis, correlations were conducted between dependent variables (CDSS and PSYRATS) and age, age of onset, time since onset and PANSS positive and negative symptom totals. Symptom-related distress as measured by the PSYRATS was significantly correlated with the PANSS positive symptoms scale ($r=.337, p=.004$) which was therefore included as a covariate in mediation analyses involving the PSYRATS. No other significant associations were found. An independent-samples t-test was conducted in order to establish any gender differences on dependent variables. No differences were found (CDSS $t(68)=-1.56, p=.123$; PSYRATS $t(68)=.49, p=.629$).

In order to address the first and second hypotheses Pearson's correlations were conducted. Results are summarised in Table 3.3.

Table 3.3: Correlation matrix detailing correlations (Pearson's *r*) between independent and dependent variables¹

	PAM (anxiety)	PAM (avoidance)	ERQ (reappraisal)	ERQ (suppression)	IIP-32 (total interpersonal problems)	CDSS	PSYRATS
PAM (anxiety)	1						
PAM (avoidance)	.244*	1					
ERQ (reappraisal)	-.012	-.043	1				
ERQ (suppression)	.251*	.303*	.266*	1			
IIP-32 (total interpersonal problems)	.640***	.332**	-.001	.134	1		
CDSS	.524***	.269*	-.091	.213	.505***	1	
PSYRATS	.397***	.324**	-.068	.088	.527***	.318**	1

¹ **p*<.05; ***p*<.01; ****p*<.001 (two-tailed).

As hypothesised, both attachment anxiety and avoidance were positively correlated with depression ($r=.524, p=.000$; $r=.269, p=.025$ respectively) and symptom-related distress ($r=.397, p=.001$; $r=.324, p=.006$), indicating that greater levels of attachment anxiety and avoidance are associated with higher levels of depression and distress. In support of the second hypothesis significant positive correlations were also found between attachment anxiety and avoidance and interpersonal problems ($r=.640, p=.000$; $r=.332, p=.005$) showing that higher levels of attachment insecurity are associated with more interpersonal problems. Expressive suppression was significantly correlated with both attachment anxiety and avoidance ($r=.251, p=.037$; $r=.303, p=.011$) indicating that attachment insecurity is related to greater use of suppression as an emotion regulation strategy. Using Cohen's⁵¹ criteria for interpreting effect sizes all effects were medium to large in magnitude. No significant associations were found between attachment dimensions and cognitive reappraisal ($r=-.012, p=.923$; $r=-.043, p=.728$). Large significant positive correlations were found between interpersonal problems and depression and distress ($r=.505, p=.000$; $r=.527, p=.000$) indicating that higher levels of interpersonal difficulties are associated with greater emotional distress. Neither emotion suppression nor cognitive reappraisal was significantly correlated with depression ($r=.213, p=.079$; $r=-.091, p=.457$) or distress ($r=.088, p=.473$; $r=-.091, p=.457$). Therefore hypothesised associations between greater attachment insecurity

and higher levels of depression and symptom-related distress were supported, as were predicted relationships between greater attachment insecurity and interpersonal problems. Predicted associations between attachment dimensions and emotion regulation were only partially supported.

4.5.3 Mediation analysis

The initial step in addressing the third hypothesis was simple mediation analysis which was carried out using the bootstrapping re-sampling method outlined by Preacher and Hayes⁶⁶ using the recommended 95% confidence intervals and 5000 bootstrap samples. The mediation effect is considered significant if the upper and lower bounds of the bias corrected confidence intervals (BC CI) do not contain zero, indicating the likelihood that the mediation effect does not equal zero at the required confidence level ($p < .05$). Mediation models are tested where there is an established relationship between the independent and dependent variables, whereas indirect effects can be tested where no significant relationship is apparent.⁶⁷ As demonstrated above significant relationships existed between independent and dependent variables therefore analyses were carried out to identify mediation effects. Models were tested for the mediating effects of interpersonal problems and expressive suppression between independent variables (attachment anxiety and avoidance) and dependent variables (depression and symptom-related distress). Cognitive reappraisal was not included as a potential mediator due to the lack of association between this variable and independent or dependent variables. Severity of positive symptoms as assessed by the PANSS was entered as a covariate in mediation analyses with symptom-related distress (PSYRATS) as the dependent variable, due to the significant correlation between these variables. As recommended by Preacher & Kelley⁶⁸ kappa-squared (κ^2) values are reported as an estimation of effect size alongside the proportion of variance accounted for by the model (R^2). Effect size measures for indirect effects are not available for models with covariates.

Results of the simple mediation models indicated that interpersonal problems significantly mediated the relationships between attachment anxiety and depression (BC CI = .31-3.05) and attachment avoidance and depression (BC CI = .33-2.94) as the bounds of the BC CI did not include zero. The models accounted for 27 per cent and 7 per cent of the variance in depression respectively ($R^2 = .27, .07$) and effect sizes were medium ($\kappa^2 = .17, .16$).

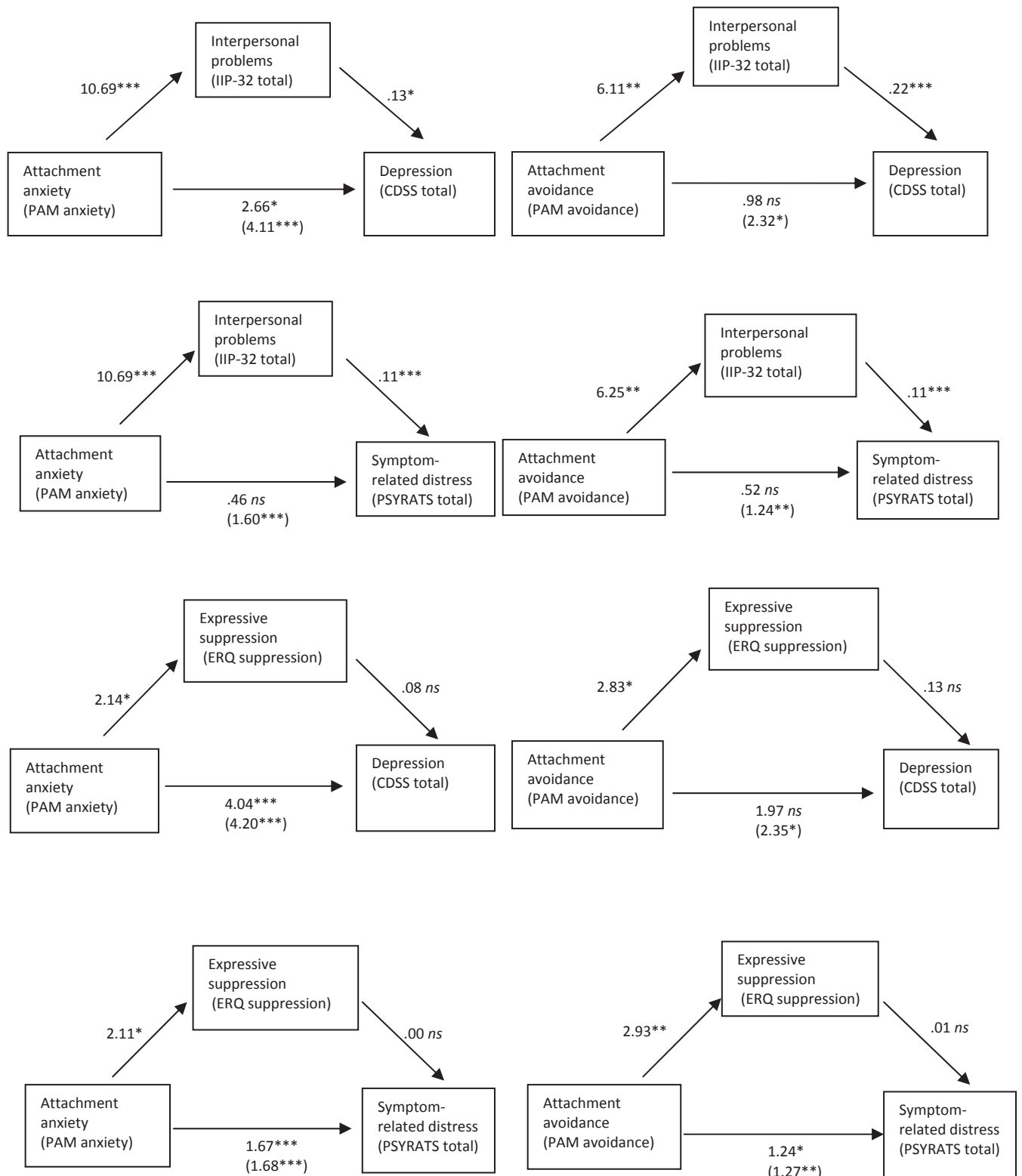
Interpersonal problems also significantly mediated the relationships between attachment anxiety and symptom-related distress (BC CI=.67-1.81) and attachment avoidance and symptom-related distress (BC CI=.20-1.46), accounting for 29 per cent and 20 per cent of the variance in distress respectively ($R^2=.29, .20$). Therefore the hypothesised mediating effect of interpersonal problems in the relationships between attachment insecurity and emotional distress were supported.

No overall mediation effects were indicated for expressive suppression in the relationships between attachment dimensions and depression as the bounds of BC CI contained zero (anxiety BC CI -.14-.81; avoidance BC CI -.15-1.35). Similarly no mediation effects were apparent between attachment dimensions and symptom-related distress (anxiety BC CI =-.24-.22; avoidance BC CI=-.27-.40). Thus the predicted mediating effects of expressive suppression were not supported.

As no mediation effects of expressive suppression were found multiple mediation models were not tested. All simple mediation models are illustrated in Figure 3.1.

Figure 3.1: Mediation models¹. Unstandardised regression co-efficients are reported. Those within parentheses indicate effects prior to proposed mediator (i.e. total effects).

¹* $p < .05$; ** $p < .01$; *** $p < .001$



4.6 Discussion

Increasing research and clinical interest regarding the roles of interpersonal functioning and affect regulation in influencing the development and course of psychosis, and in how to integrate these factors into a model to inform psychological formulation and intervention, has implicated attachment theory in the conceptualisation of psychosis.¹⁰ This study contributes to the increasing body of evidence suggesting that adult attachment style is a clinically relevant psychological framework in which to understand aspects of emotional recovery in individuals with psychosis and provides some insights into psychological mechanisms which may be implicated within this.

Results of this research support the hypothesis that greater levels of attachment insecurity as measured on dimensions of anxiety and avoidance are associated with greater levels of depression and symptom-related distress in a sample of individuals with psychosis. Interpersonal problems significantly mediated this relationship. The hypothesis that problems with emotion regulation would also mediate this relationship was not supported, although associations between attachment insecurity and higher rates of expressive suppression were found. Mean attachment scores for the dimensions of anxiety and avoidance were similar to those reported in other studies¹⁸ and indicated a larger proportion of predominantly avoidant attachment styles compared with predominantly anxious in the sample in accordance with previous findings.¹¹

The finding that attachment insecurity is associated with greater levels of emotional distress concurs with existing research reporting links between attachment and depression.^{11,18,19} The relationship between attachment anxiety and depression was particularly strong, representing a large effect size. This finding corresponds with the results of Kvrđić and colleagues' research¹¹ which found a trend towards higher levels of depression in individuals with predominantly anxious styles as opposed to predominantly avoidant, although both studies had a higher proportion of individuals with predominantly avoidant attachment styles which may have biased results. Therefore this study contributes to the growing body of evidence suggesting that insecurity in adult attachment style may be a risk factor for increased vulnerability to depression and emotional distress in individuals with psychosis. Considering the potentially devastating impact of depression for people with psychosis, early identification and access to appropriate treatment and support are

vital. Routine assessment of attachment styles of people with psychosis who are in contact with mental health services has previously been advocated in order to identify those who may experience difficulties in engaging with services or treatment.³⁸ The results of the current study suggest that such assessment may also be beneficial in identifying individuals who may be at increased risk of depression and high levels of distress in order to try to improve outcomes for these individuals.

Interpersonal problems were strongly associated with depression and symptom-related distress indicating that these may also represent a significant risk factor for increased emotional distress. Interpersonal problems were also found to mediate the relationship between attachment insecurity and emotional distress, suggesting that difficulties in interpersonal functioning are a clinically relevant psychological mechanism connecting insecurity in adult attachment to increased emotional distress in individuals with psychosis. The proportion of variance accounted for in the mediation models was relatively higher for anxiety (27 per cent and 29 per cent) compared with avoidance suggesting that mediation effects may be particularly relevant for attachment anxiety.

Predicted associations between attachment, emotional distress and emotion regulation were only partially supported. Expressive suppression was moderately correlated with attachment anxiety and avoidance but no relationships between cognitive reappraisal and attachment dimensions were found. Interestingly neither aspect of emotion regulation correlated with depression or symptom-related distress and expressive suppression did not mediate the relationships between attachment insecurity and emotional distress. This is partially consistent with previous research which reported no relationship between expressive suppression and depression⁴⁶; however varies from findings suggesting that cognitive reappraisal is negatively correlated with depression.⁴⁴ The ERQ consists of relatively conceptual items which are rated on a 7-point Likert scale.⁴² Considering that cognitive impairments associated with psychosis may contraindicate use of wide-ranging, non-anchored response scales and abstract questions⁸, a degree of measurement error may have played a role in the lack of significant findings. However mean scores on the reappraisal and suppression sub-scales of the ERQ were similar to those reported in previous research^{46,48} suggesting that the sample was broadly representative of the population of individuals with psychosis in terms of emotion regulation strategies endorsed. It has been suggested that differences in diagnostic prevalence in samples may in

part account for differences in emotion regulation findings, with higher proportions of schizoaffective disorder (the diagnosis of which implies less impairment in social functioning compared with schizophrenia) in samples resulting in masking of differences in emotion regulation.⁴⁷ The sample in this study had a moderate proportion of participants with schizoaffective disorder (11.4 per cent) compared with proportions in other studies⁴⁷, thus potential effects of emotion regulation may have been concealed.

Expressive suppression has historically been of interest in terms of emotion regulation strategies in psychosis due to the common clinical presentation of flat affect⁴⁶. However recent research has investigated aspects of alternative models of emotion regulation, with results suggesting that cognitive strategies, such as self-blame and catastrophising, and behavioural or experiential strategies, such as acceptance and willingness, may influence psychosocial outcomes in psychosis and provide potential targets for treatment.^{69,49,70} Thus research into the role of emotion regulation strategies and their clinical correlates in psychosis could be usefully expanded to include other dimensions. The mediation models hypothesised in the current study could be tested using different conceptualisations of emotion regulation to help to elucidate the relationships between adult attachment style, emotional recovery and emotion regulation in psychosis.

Interestingly, this study did not find significant associations between positive and negative symptoms of psychosis and depression. Previous research has found only partial evidence of a relationship between positive symptoms and depression⁷⁸. The results of this study therefore offer additional evidence that severity of symptoms alone does not influence emotional distress in psychosis, and therefore reinforces that treatment of psychosis should extend beyond the alleviation of symptoms and should encompass a broader consideration of mental health and well-being^{75,79}.

Psychological therapies are increasingly recommended in the treatment of psychosis to help relieve emotional distress and improve functioning especially in light of growing acknowledgement of the limitations of the medical model of treatment.^{71,72} The growing influence of the recovery movement which defines recovery in holistic terms as living well in the presence or absence of symptoms⁷³ also emphasises the importance of emotional recovery. In terms of psychological treatments Cognitive Behavioural Therapy for psychosis (CBTp) is the recommended evidence-based individual therapy^{71,72} and has proven efficacy for affecting change in positive and negative symptoms and depression.⁷¹ Outcomes

assessed in trials of CBTp are often symptom-focussed⁷¹ and treatment manuals often focus on positive symptoms.⁷⁴ The findings of this study reinforce suggestions made by others in the field that emotional recovery is not necessarily related to symptoms and may be a more important outcome in interventions.⁷⁵ CBTp has been demonstrated to have only limited impact on interpersonal difficulties⁷⁶ and these are often not an integral focus of treatment. The results of this study suggest that interpersonal problems may offer a useful additional focus of psychological interventions in order to alleviate psychological distress in individuals with psychosis. Considering findings suggesting a degree of discordance between patient and clinician ratings of patients' interpersonal difficulties³⁴, careful assessment and collaborative formulation is indicated when interpersonal functioning is a focus of intervention. Gumley and Schwannauer⁷⁵ outline a cognitive interpersonal therapy (CIT) treatment approach for psychosis which encompasses an interpersonal focus alongside evidence-based aspects of CBTp. CIT has its theoretical foundations rooted in attachment theory and uses this as a basis for understanding the interpersonal context of recovery. The results of the current study indicate that this may be a beneficial treatment approach in terms of improving outcomes for depression and emotional distress associated with psychosis. CIT is designed as an approach which should inform the working of the whole multi-disciplinary team⁷⁵ in order to support patient recovery. The results of this study indicate that attachment-informed services as proposed in CIT and in recent service development consultations⁷⁷ may be valuable aspect of promoting recovery for people with psychosis. Further research into the efficacy and effectiveness of CIT for psychosis is warranted to help inform future recommendations for treatment and service provision.

Several limitations should be considered when interpreting the results of the present study. As with all cross-sectional research no causality can be inferred from the pathways identified and relationships between attachment dimensions, emotional distress and interpersonal problems are likely to be dynamic and bidirectional. Due to the recruitment methods utilised, a self-selecting bias may have been in play as recruitment was reliant on relationships between patients and mental health staff. Therefore the sample may represent a sub-set of the population of individuals with psychosis who have fewer interpersonal difficulties and more secure attachment styles. The simple mediation models utilised to test hypotheses do not allow for the quantification of differential effects of attachment anxiety and avoidance on emotional recovery. Although multicollinearity was not indicated between attachment variables there was a degree of correlation between

these which may make it difficult to reliably interpret results in terms of the relative influences of anxiety and avoidance. Larger samples in future research may allow for use of structural equation modelling techniques which could offer more insight into the complex relationships between variables.

Despite these limitations this study represents a significant contribution to the research base regarding adult attachment styles in psychosis and indicates associations between attachment insecurity along dimensions of anxiety and avoidance and depression and symptom-related distress. These relationships were significantly mediated by degree of interpersonal problems. To the author's knowledge this study is the first to investigate these variables in a sample of individuals with psychosis and to explore mediation effects between attachment insecurity and emotional distress thus providing important insights into clinically relevant potential pathways to emotional distress in this population.

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