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A systematic review of attachment and psychosis: measurement, construct validity and outcomes.

A. I. Gumley, H. E. F. Taylor, M. Schwannauer, A. MacBeth

Objective: This review sought to identify, summarise and critically evaluate studies that investigated attachment amongst individuals with psychosis.

Method: The following computerised databases searched were CINAHL < 1980 to December 2012; EMBASE < 1980 to December 2012; Ovid MEDLINE (R) < 1980 to December 2012; PsychINFO < 1980 to December 2012; and Google Scholar < 1980 to December 2012.

Results: We identified 22 papers describing 21 studies comprising 1453 participants, with a mean age of 35.0 years (range of 12–71 years), of whom 68.4% (n = 994) were male. Of our sample, 1112 (76.5%) had a diagnosis of schizophrenia. We found small to moderate associations between greater attachment insecurity (as reflected in anxiety and avoidance) and poorer engagement with services, more interpersonal problems, more avoidant coping strategies, more negative appraisals of parenting experiences and more severe trauma. We also found small to modest associations between attachment insecurity and more positive and negative symptoms and greater affective symptom problems.

Conclusion: Attachment theory may be useful as a means of understanding the developmental and interpersonal basis of recovery and adaptation in the context of psychosis. However, further research comprising more representative samples in their first episode and using prospective designs is required.

Introduction

There is growing evidence that stressful developmental experiences and traumatic life events including sexual abuse, being in care and homelessness are linked to increased vulnerability to developing psychosis (1, 2). Indeed, early adversity may impact on later expression of psychosis by increasing stress sensitivity to later stressful life events (3, 4). Attachment theory (5) has been successful in understanding adaptation to the long-term impact of adverse developmental experiences (e.g. abuse) or stressful life events (e.g. loss) (6). Security of attachment is a significant building block to resilience and is linked to successful adaptation and recovery following life adversity (7). Strong evidence shows that insecure and disorganised attachments are significant risk factors for psychopathology including suicidal behaviour (8, 9). Attachment theory is a developmental model of interpersonal and psychological functioning, personal resilience and affect regulation, derived from an understanding of the affectionate bonds created in the context of close relationships, initially with primary caregivers (5). Attachment theory provides a developmental understanding of affect regulation, emerging from the evolutionary necessity for the infant to establish a safe haven (for distress) and secure base (for exploration). Securely attached infants utilise caregivers as a base to explore and as a source of safeness in response to perceived threat. In adulthood, this is characterised by a freedom and autonomy to reflect on and explore painful feelings and a valuing of close interpersonal relationships. Infants who are insecurely attached show a different pattern of affect regulation. Ambivalent/resistant attachment is characterised by heightened affective expression (including feelings of anger and anxiety) and a reluctance to explore the world reflected in clinging to the caregiver. In adulthood, this is reflected in preoccupation with

attachment experiences and heightened emotional expression. Infant avoidant attachment represents a deactivation of the attachment behaviours reflecting a relative indifference to the attachment figure. In adulthood, avoidant or dismissive attachment is characterised by minimising and avoidance of attachment-related experiences, thoughts and memories. These strategies are functional in their developmental context and are key in the unfolding of interpersonal functioning, resilience and constructive adaptation to threatening life events (6, 8).

An important review (10) found an over representation of insecure attachment amongst individuals with psychosis. However, the systematic review did not distinguish between inferred attachment-related experiences (e.g. self-reports of parental bonding) and attachment states of mind as reflected in individuals' appraisals of their close personal relationships or their narratives during attachment-related discourse. In the five years since this review, there has been an increasing interest in the phenomenology of attachment amongst people with psychosis and its relationship to key outcomes of interest including the influence of social, cognitive, interpersonal and affective factors on the development and course of psychosis.

Aims of the study

Therefore, this review sought to identify, summarise and critically evaluate articles that have investigated attachment amongst individuals with psychosis.

Questions. Specifically the following questions were asked:

- i) What are the characteristics of studies, which have investigated attachment in psychosis?
- ii) What measures have been used to characterise attachment?
- iii) What is the evidence for construct validity in the assessment of attachment in psychosis?
- iv) What is the evidence for the association of attachment with important clinical outcomes in psychosis?

Material and methods

Inclusion and exclusion criteria

Inclusion criteria were articles that included (i) a measure of attachment, (ii) participants who experienced psychosis, (iii) participants who were deemed at risk of developing psychosis (iv) were published between 1980 and January 2013 and (v) were written in English.

Exclusion criteria were (i) non-clinical/analogue studies, (ii) qualitative data, (iii) single case studies or dissertations, (iv) conference extracts, (v) book chapters, (vi) unpublished studies, (vii) those without a measure of attachment and (viii) attachment was not assessed in relation to outcomes associated to the experience of psychosis.

Outcomes

The outcomes for schizophrenia and psychosis were identified from the National Institute for Health and Clinical Excellence (11) schizophrenia guideline. The outcomes chosen were relevant to the data

from the studies and include psychiatric symptoms, relapse/hospitalisation, engagement, social functioning, psychosocial functioning, insight and quality of life.

Search strategy

A systematic review was conducted by searching computerised databases for relevant articles investigating the relationship between adult attachment style and psychosis or schizophrenia. The following computerised databases searched were CINAHL < 1980 to December 2012; EMBASE < 1980 to December 2012; Ovid MEDLINE (R) < 1980 to December 2012; PsychINFO < 1980 to December 2012; and Google Scholar < 1980 to December 2012.

The computerised search used the subject headings (PSYCHOSIS) or (SCHIZOPHRENIA) or (PSYCHOTIC DISORDER) combined with (ADULT ATTACHMENT INTERVIEW) or (ADULTATTACHMENT) or (ATTACHMENT). Online titles and abstracts were reviewed after duplicates were removed. Articles that did not meet the inclusion criteria were discarded, and the full text was obtained from articles that were potentially eligible. Hand searches of journals (e.g. British Journal of Clinical Psychology, Schizophrenia Bulletin, Psychology and Psychotherapy: Theory, Research and Practice, Clinical Psychology Review) and references for eligible articles were conducted to identify further relevant articles that may have been missed by the electronic search strategy.

Quality criteria

All selected articles were subjected to evaluation to assess risk of bias and quality. This was based on the Cochrane Consumers and Communication Review Group data extraction template (12) and Clinical Trials Assessment Measure (13). The extraction sheet consisted of five sections to rate the methodological quality of the introduction, sample, procedure, analysis and discussion. All the articles were rated using the extraction sheet by two independent reviewers. Any disagreements were resolved by discussions between the two reviewers and consultation with a third reviewer (AG).

Results

Literature search

The search and exclusion process is summarised in Fig. 1 below. We identified 41 potential papers and the manual search identified 9 potential papers. Of these, 28 were excluded after two reviewers assessed the articles following the inclusion and exclusion criteria (H.T & A.G). Reasons for exclusion were as follows: non-clinical/ analogue studies (n = 7), participants not experiencing psychosis (n = 6), qualitative studies (n = 3), unpublished thesis (n = 1), no attachment measure (n = 9) and attachment not assessed in relation to outcomes in psychosis (n = 2). Based on this search strategy, 22 papers met the criteria for inclusion into the review.

Included studies

There were 21 papers describing 20 studies that met the inclusion criteria for this review: Arbuckle, Berry, Taylor & Kennedy (15); Berry, Barrowclough & Wearden (16, 17); Berry, Wearden, Barrowclough, Oakland & Bradley (18); Blackburn, Berry & Cohen (19); Couture Lecomte & Leclerc (20); Dozier (21); Dozier, Cue & Barnett (22); Dozier & Lee (23); Dozier, Lomax, Tyrrell & Lee (24);

Dozier, Stevenson, Lee & Velligan (25); Kvrđic, Beck, Calvelti, Kossowsky, Stieglitz & Vauth (26); MacBeth, Gumley & Schwannaeur (27); Mulligan & Lavender (28); Picken, Berry, Tarrier & Barrowclough (29); Ponizovsky, Nechamkin & Rosca (30); Ponizovsky, Vitenberg, Baumgarten-Katz & Grinshpoon (31); Tait, Birchwood & Trower (32); Tyrrell, Dozier, Teague & Fallot (33); Quijada, Tizon, Artigue, Kwapil & Barrantes-Vidal (34); Owens, Haddock & Berry (35) and Kvrđic, Cavelti, Beck, Rusch & Vault (36). Table 1 provides a summary of included studies.

Study/participant characteristics

There were 1453 participants in the included studies. Based on data from 19 studies, the mean age of the participants was 35.0 years (range of 12– 71 years). No data were provided on the age of 49 participants (4%) (23). Based on the data of 19 studies, 68.4% (n = 994) participants were male and 28.1% (n = 409) were female. No data regarding gender were provided for 42 participants (3.2%) (21). The inclusion or exclusion criteria were not explicitly stated for eight studies (15, 19, 21–24, 29, 30, 33). All of the studies used a convenience sample, and a variety of recruitment sites were identified. Three studies (9.1%; n = 132) recruited from inpatient services (15, 19, 30), six studies (37.4%; n = 544) from out-patient/community services (26–28, 31, 33, 36), four studies (20.0%; n = 291) recruited from both inpatient and community settings (17, 18, 20, 21), one study (2.1%; n = 31) from a specialist at-risk team (34) and one study (35) from 24-h rehabilitation services (3.3%; n = 48). Six studies (16, 22/23–25, 29, 32) (27.9%; n = 406) did not report the specific recruitment site (16, 24, 32).

The diagnosis of the participants included schizophrenia (57.6%; n = 837), schizophrenia spectrum diagnosis (12.0%; n = 174), schizoaffective disorder (10.7%; n = 155), bipolar affective disorder (7.0%; n = 101), at-risk mental state (2.1%; n = 31), psychotic episode (0.9%; n = 13), psychosis NOS (1.0%; n = 14), persistent delusional disorder (0.1%; n = 2), atypical psychosis (0.1%; n = 2), mania and psychotic symptoms (0.1%; n = 1), recurrent depressive disorder and psychotic symptoms (0.1%; n = 2), major depression (1.2%; n = 17), substance misuse (0.2%; n = 3), Asperger's syndrome (0.1%; n = 1), panic disorder (0.1%; n = 1), conversion disorder (0.1%; n = 1) and symptoms commonly associated with psychosis (n = 5.0%; n = 73). The diagnoses of 682 participants were not confirmed using a standard diagnostic classification system (46.9%) (15, 16, 19, 20, 28, 29, 35, 36).

Education level was explicitly reported in nine studies (16, 20, 25–27, 30, 31, 33, 34). Approximately 38.4% (n = 558) of participants received or were in secondary education. No data were provided for 55.1% (n = 801) participants' level of education. Employment status was explicitly reported in five studies (26, 27, 31, 35, 36). Approximately 60.0% (n = 247) were unemployed. No data were provided for 71.6% (n = 1041) participants' employment status. Medication was reported in four studies (13.8%; n = 201) (26, 27, 30, 34). There were six studies (15–17, 29, 32, 35) (28.1%; n = 409), which provided the consent rate. The characteristics of the participants who chose not to take part were not noted in any study. Only one study (32) (3.4%; n = 50) conducted an analysis comparing the participants and those who refused to participate or dropped out. In addition, one study (16) provided a flow diagram of the recruitment process (6.6%; n = 96).

Measurement

Psychosis Attachment Measure. Nine studies (15– 19, 26, 29, 35, 36) used the Psychosis Attachment Measure (PAM) (37) self-report questionnaire (54.6%; n = 793). Three self-report versions of the

PAM were used (PAM; attachment in general relationships, attachment towards key worker, and attachment in relation to the mental health team) and two informant versions (PAM; key worker and team) (15, 16). PAM items were derived from existing self-report attachment measures, excluding items referring to romantic relationships (38–40). Respondents rate on a four-point Likert scale the extent to which each statement describes how they currently relate to key people in their life. The PAM assesses two dimensions of anxious and avoidant attachment. Total scores are calculated for each dimension by averaging item scores, with higher scores reflecting greater anxiety and avoidance. Acceptable levels of internal consistency have been demonstrated across the included studies, with Cronbach's alpha coefficients ranging from 0.70 to 0.86 for the anxiety dimension and from 0.60 to 0.91 for the avoidance dimension (15–19, 26, 29, 35, 36).

Adult Attachment Interview. Six studies (21, 22/23–25, 27, 33) used the Adult Attachment Interview (AAI; 19.3%; n = 280) (41). The AAI (41) is a semi-structured interview, consisting of 20 questions and probes, allowing categorisation of an adult individual's state of mind with regard to attachment. Attachment classifications are allocated on the basis of the coherence of interview response and nature of the representation of attachment. Interview stability has been reported at 4-year intervals (42). A key strength of the AAI over other methods of assessing attachment is the strong correspondence between parental AAI responses and infant attachment security (41). Maternal Coherence of Transcript score is the most significant predictor of attachment security in infancy (43). The AAI can be analysed in two distinctive ways, either by using the Q-sort method or narrative approach.

The Q-sort method was used in five studies (21, 22/23–25, 33) using the attachment interview Q-set (44). A Q-set consists of 100 items derived from Main and Goldwyn's (44) attachment classifications (see below), and these items are used to describe each subject from most to least characteristic. Two raters perform Q-sorts which are averaged and then correlated with two attachment dimensions. The first dimension differentiates the attachment classification (security vs. insecurity (anxiety) or autonomous vs. non-autonomous), and the second dimension differentiates the strategies used to reduce distress (deactivation vs. hyper activation or avoidant (repression) vs. preoccupation). Kobak (44) compared the Main and Goldwyn (45) categorical system with the Q-sort approach, discriminant function analysis revealed an 88–94% concordance rate between the two systems.

The narrative approach was used in one study (27). Each interview is transcribed verbatim and coded for attachment status by coders trained in the AAI coding system (version 7.1) (46). Coding relies on the scoring of overall coherence of narrative as the key index of insecure attachment, which is defined as the degree to which speakers portray their attachment experiences in a coherent and collaborative manner. Insecure attachment is characterised by significant contradictions and inconsistencies in attachment narratives or may be reflected in passages that are exceptionally short, long, irrelevant or difficult to follow (41).

Transcripts are allocated one of three 'organised' categories: One 'secure' category – 'freely autonomous' – and two 'insecure' categories – 'dismissing' and 'preoccupied' (45). In addition, transcripts can be assigned a category of 'unresolved' with regard to trauma and loss, where the coherence of an interviewee's narrative breaks down. In transcripts coded 'Unresolved', an 'Organised' category is also assigned.

Attachment Style Questionnaire. The Attachment Style Questionnaire (ASQ) (47), used by two studies (20, 28) (11.6%; n = 169), is a self-report measure assessing an individual's internal working model of general relationships. The included studies (20, 28) showed moderate to good internal consistency values. It can be used as a continuous measure of attachment security or to divide participants according to four attachment style groups including autonomous, avoidant, preoccupied and ambivalent.

The Relationship Questionnaire. The Relationship Questionnaire (RQ) (48) is used in two studies (31, 34) (9.0%; n = 131). This brief self-report questionnaire is an adaptation of the Adult Attachment Questionnaire (AAQ) (49) and categorises adult attachment styles through four brief statements. Participants select the most self-descriptive statement of their friendship patterns. In addition, participants can rate how much each description corresponds to their general relationships. The four attachment styles are secure, fearful/avoidant, preoccupied, and dismissing/avoidant.

Service Attachment Questionnaire. The Service Attachment Questionnaire (SAQ) (50), used in one study (19) (5.4%; n = 78), is a self-report measure assessing the security of the attachment to staff members and to the hospital. A higher score indicates greater attachment security to service. Internal consistency (19) and test–retest reliability are acceptable (50).

Revised Adult Attachment Scale. The Revised Adult Attachment Scale (RAAS) (51), used in one study (32) (3.4%; n = 50), is a self-report measure of adult attachment based on the AAQ descriptions. It contains three subscales: closeness, dependence and anxiety. Internal consistency is satisfactory (32).

The Adult Attachment Questionnaire. The AAQ (52), used in one study (30) (2.1%; n = 30), is a self-selection measure of psychological and emotional closeness in relationships, based on secure, avoidant and anxious/ambivalent attachment styles. Participants indicate which of three short descriptions of the attachment styles best describe their feelings in relationships. In addition, participants can rate how much each description corresponds to their general relationship style. The AAQ shows satisfactory internal reliability and test–retest reliability (30).

Construct validity

Evidence of construct validity for the attachment measures used to investigate psychosis can be shown through the association with other theoretically related measures. These measures included domains of engagement with mental health services, hospitalisation, interpersonal problems, recovery/coping style, parental bonding, trauma, premorbid adjustment and reflective functioning (RF).

Engagement with mental health services. In terms of construct validity, we would expect greater attachment insecurity to be associated with poorer engagement with services. Eight studies investigated the association between attachment and engagement with mental health services. Four studies (21, 22, 27, 33) investigated engagement in relation to attachment using the AAI. From clinician ratings, Dozier et al. (21) found that greater compliance with treatment was associated with more attachment security ($r = 0.37$; $P < 0.05$). Attachment avoidance was associated with reduced likelihood to seek help ($r = -0.55$; $P < 0.01$) and poor use of treatment ($r = 0.32$; $P < 0.05$). Attachment preoccupation was associated with more self-disclosure ($r = 0.50$; $P <$

0.01). MacBeth et al. (27) found an overall association between attachment and engagement with services (Kruskal-Wallis test: $\chi^2 = 7.11$; $df = 2$; $P = 0.029$; $r = 0.60$). Specifically, secure attachment was associated with better engagement than avoidant attachment (Mann-Whitney U test: $U = 11.5$; $P = 0.011$). Also those classified as secure in their attachment had better treatment adherence compared to preoccupied attachment (Mann-Whitney U test: $U = 3$; $P = 0.018$).

One further study (22) showed that these associations between attachment insecurity and engagement problems may be partially accounted for by the attachment security of the person's case manager. Participants relying on preoccupied strategies were perceived by their case managers as being more dependent ($r = 0.61$; $P < 0.01$). However, case managers who were themselves more insecure perceived clients who were more preoccupied as having greater dependency needs than clients who were dismissing ($r = 0.80$; $P < 0.01$). Tyrell et al. (33) reported that less avoidant case managers formed stronger alliances with more deactivating clients than with less deactivating clients ($r = 0.53$; $P < 0.01$).

Three studies (16, 19, 26) used the PAM to investigate engagement with services. Berry et al. (16) found that higher attachment avoidance was associated with lower therapeutic alliance as rated by patient ($r = -0.44$; $P < 0.001$) and by staff ($r = -0.33$; $P = 0.003$). These effects were maintained when controlling for symptom severity. Blackburn et al. (19) found associations between better attachment to services and greater security of attachment ($r = -0.39$; $P < 0.001$). Kvirgic et al. (26) found higher attachment anxiety was associated with more treatment adherence ($r = 0.20$; $P = 0.02$) (SES). Finally, Tait et al. (32) found that greater insecurity of attachment was associated with greater likelihood to disengage from mental health services than secure attachment ($t = 3.64$; $P < 0.001$; $r = 0.21$).

Hospitalisation. We expected to observe that greater attachment insecurity would be associated more severe indices of hospitalisation (e.g. more frequent and longer hospitalisations and greater likelihood of compulsory admission). Blackburn et al. (19) found more hospital admissions were related to less attachment to services ($r = -0.33$; $P = 0.004$), and people sectioned under the Mental Health Act reported lower levels of attachment to services than those not under section ($t = -3.27$; $P = 0.002$; $r = 0.13$). Ponizovsky et al. (30) found those with more avoidant attachment spent longer in psychiatric hospitals compared to those with secure attachment ($t = 2.29$; $P < 0.05$; $r = 0.20$).

Interpersonal problems. In terms of construct validity, we would expect greater attachment insecurity to be associated with more interpersonal problems. Four studies investigated the association between attachment and interpersonal problems. Two studies (24, 25) explored the AAI in relation to interpersonal problems. Dozier et al. (24) used the interpersonal problem-solving task which focused on interactions with case managers. Those with avoidant attachment were off task significantly more than others ($r = -0.54$; $P < 0.05$), were more rejecting of their significant others ($r = 0.52$; $P < 0.05$) and were more confused following interactions with case managers ($r = 0.51$; $P < 0.05$). The significant others of clients with avoidant attachment felt less supported ($r = -0.53$; $P < 0.05$) and more saddened ($r = 0.57$; $P < 0.05$) following the tasks. Dozier et al. (25) found increased use of insecure

attachment strategies (avoidance and preoccupation) amongst families with greater expressed emotion (overinvolvement; $F = 3.44$; $P < 0.05$; $r = 0.16$).

Three studies (16, 20, 26) explored the PAM in relation to interpersonal problems. Berry et al. (16) showed associations between greater interpersonal problems and increased attachment avoidance ($r = 0.28$; $P < 0.01$) and anxiety ($r = 0.58$; $P < 0.001$). Specifically, individuals with higher attachment anxiety displayed more attention seeking behaviour, $t(77) = 2.82$; $P = 0.006$; $r = 0.1$, and individuals with higher attachment avoidance displayed more hostility, $t(77) = 2.77$; $P = 0.007$; $r = 0.1$. These associations were maintained when controlling for the influence of symptom severity. Kvrjic et al. (26) found that higher attachment anxiety was associated less positive clinician input ($r = -0.18$; $P < 0.05$) and that attachment avoidance was associated with non-supportive clinician input ($r = 0.19$; $P = 0.03$), less positive clinician input ($r = -0.23$; $P = 0.01$) and poorer relationships with professionals ($r = -0.25$; $P < 0.01$). Finally, Couture et al. (20) found inappropriate community behaviour was associated with greater discomfort with closeness ($r = -0.31$; $P < 0.01$).

Recovery/Coping style. Two studies (28, 32) explored attachment in relation to recovery style. McGlashan (53) defined 'clinically distinct recovery styles' of 'integration' and 'sealing over' reflected in the form and coherence of individuals' narratives. An Integrated recovery style is characterised by a narrative which reflects awareness of the continuity of experiences before, during and after psychosis, a balanced perspective on the positive and negative aspects of experience, where psychotic experiences are a source of learning; and a curiosity about the experience of psychosis itself which is linked to enlisting supportive others in scaffolding understanding. In contrast, sealing over indicates active attempts to isolate the experience of psychosis, avoidance and minimisation of its influence on the self. Integration and sealing over were understood as coping styles applicable to other life events and conflicts. Therefore, the regulation of painful emotions – as reflected in thoughts, feelings and memories associated with the experience of mental illness – was fundamental to the original formulation of recovery style. Therefore, in terms of construct validity, we would expect greater security of attachment to be associated with a tendency towards an integrating recovery style and insecurity of attachment (particularly dismissing) to be associated with a sealing-over recovery style. Mulligan and Lavender (28) found an association between more avoidant recovery/coping style and the 'relationships as secondary to achievement' subscale ($r = -0.41$; $P < 0.01$). Tait et al. (32) found that insecure attachment was associated with an avoidant coping style (sealing over). Sealing over was associated with more anxiety about interpersonal rejection ($F = 12.20$; $P < 0.001$; $r = 0.23$), lower levels of comfort with closeness ($F = 7.43$; $P < 0.01$; $r = 0.16$) and greater dependence in relationships ($F = 13.51$; $P < 0.001$; $r = 0.24$).

Given that a key function of the construct of recovery style is the regulation of affect, we also included the study by Owens et al. (35) in this section. They found that attachment anxiety and therapeutic alliance were significant predictors of emotion regulation problems, but not attachment avoidance, negative emotion or psychotic symptoms. Specifically, attachment avoidance was significantly positively correlated with global emotion regulation difficulties ($r = 0.42$; $P = 0.003$) including non-acceptance of emotions ($r = 0.37$; $P = 0.01$), lack of emotional awareness ($r = 0.54$; $P < 0.001$) and lack of emotional understanding ($r = 0.47$; $P = 0.001$). Attachment anxiety was associated

with non-acceptance of emotions ($r = 0.72$; $P < 0.001$), difficulties in engaging in goal-directed behaviour when upset ($r = 0.54$; $P < 0.001$), impulse control difficulties ($r = 0.60$; $P < 0.001$), limited access to situationally appropriate emotion regulation strategies ($r = 0.66$; $P < 0.001$) and lack of emotional clarity ($r = 0.48$; $P < 0.001$).

Parental bonding. In terms of construct validity, we would expect greater attachment insecurity to be associated with increased reporting of difficulties in parental relationships. Three studies (17, 28, 32) explored attachment and parental bonding using the Parental Bonding Instrument (PBI). Berry et al. (17) found associations between greater attachment anxiety (PAM) and more parental overprotection ($r = 0.24$; $P = 0.03$), but this was not maintained when controlling for depression. Greater attachment avoidance (PAM) was related to perceived lack of parental care ($r = -0.31$; $P = 0.005$) which was maintained when potential confounds were controlled.

Mulligan and Lavender (28) found an association between higher maternal care and lower discomfort with closeness ($r = -0.25$; $P < 0.05$), less need for approval ($r = -0.34$; $P < 0.05$) and less preoccupation with relationships ($r = -0.24$; $P < 0.05$; ASQ). Lower paternal care was associated with greater discomfort with closeness (ASQ; $r = -0.22$; $P < 0.05$). Maternal overprotection (intrusive and controlling) was associated with greater need for approval ($r = 0.24$; $P < 0.05$) and greater preoccupation with relationships (ASQ; $r = 0.32$; $P < 0.05$). Finally, paternal overprotection was associated with greater discomfort with closeness ($r = -0.35$; $P < 0.05$).

Tait et al. (32) found associations between greater parental care and more dependence ($r = 0.58-0.61$; $P < 0.01$) and closeness in relationships ($r = 0.62$; $P < 0.01$). In contrast, parental abuse was related to less dependence ($r = -0.41$ to -0.58 ; $P < 0.01$) and closeness ($r = -0.31$ to -0.54 ; $P < 0.05$). Furthermore, anxiety about rejection was related to greater parental abuse ($r = 0.45-0.54$; $P < 0.01$) and lower care ($r = -0.57$ to -0.60 ; $P < 0.01$).

Trauma. In terms of construct validity, we would expect greater attachment insecurity to be associated with more experiences of trauma. Two studies (17, 29) explored attachment in relation to trauma. Berry et al. (17) found higher levels of attachment anxiety in those who had experienced trauma with significant others in childhood compared to those who had experienced trauma with significant others in adulthood, non-significant others and those with no interpersonal trauma, $F(3, 76) = 3.43$; $P = 0.021$; $r = 0.13$. Picken et al. (29) found that attachment anxiety was associated with total number of traumatic events ($r = 0.38$; $P < 0.01$), interpersonal traumatic events ($r = 0.37$; $P < 0.01$) and severity of post-traumatic symptoms ($r = 0.36$; $P < 0.01$).

Premorbid adjustment. In terms of construct validity, we would expect greater attachment insecurity to be associated with poorer premorbid functioning. Two studies (27, 34) explored associations with premorbid adjustment. MacBeth et al. (27) found no associations between AAI and premorbid functioning. Although Quijada et al. (34) measured attachment and premorbid adjustment, associations were not reported.

Reflective functioning. Reflective functioning refers to an individual's understanding of the thoughts, feelings, intentions and goals of self and others and the interaction of these phenomena within the context of attachment relationships. We would expect greater attachment security to be associated with higher levels of RF. One study (27) investigated the association between AAI and RF and found that with regard to mentalisation, the median score for RF was 3 (IQR = 1–5, range 0–7), equivalent to questionable or low RF. When three-category classifications of attachment were scrutinised, significant differences between groups emerged for RF score (Kruskal-Wallis test: $\chi^2 = 9.5$; $P = 0.009$; $r = 0.73$). Post hoc analyses indicated that individuals with secure attachment classifications displayed significantly higher RF than individuals with insecure/dismissing attachment (Mann-Whitney U test: $U = 40.0$; $P = 0.012$). Individuals with insecure/preoccupied attachment classifications also displayed significantly higher RF than individuals with insecure/dismissing classifications (Mann-Whitney U test: $U = 14.0$; $P = 0.038$).

Dimensions of outcome

Attachment security was investigated in relation to a number of outcomes including positive, negative and disorganisation symptoms, depression and quality of life.

Positive, negative and disorganisation symptoms. Ten studies explored associations between attachment and psychiatric symptoms. Five studies (15–18, 26) used the PAM in relation to positive and negative symptoms. Berry et al. (16) found an association between more psychiatric symptoms and higher attachment anxiety ($r = 0.20$; $P = 0.047$) and avoidance ($r = 0.31$; $P = 0.002$). Only attachment avoidance was associated with more positive symptoms ($r = 0.35$; $P \leq 0.001$), negative symptoms ($r = 0.24$; $P = 0.019$) and paranoia ($r = 0.39$; $P \leq 0.001$). Paranoia was associated with attachment avoidance independent of severity of illness. Furthermore, there was an association between change in attachment anxiety and change in total symptoms over 6 months ($r = 0.30$; $P = 0.027$), and specifically, change in the hallucinations was associated with changes in attachment anxiety ($r_s = 0.30$; $P = 0.026$). Kvirgic et al. (26) found associations were only found between attachment avoidance and positive symptoms ($r = 0.18$; $P = 0.004$).

Berry et al. (17) found that more psychiatric symptoms were not associated with attachment anxiety ($r = 0.21$; $P = 0.068$) although the magnitude of association was similar to other studies (16), suggesting problems related to statistical power. However, more psychiatric symptoms were associated with greater attachment avoidance ($r = 0.27$; $P = 0.016$). Berry et al. (18) found higher attachment avoidance in participants who reported critical or rejecting voices ($t = 3.14$; $P < 0.002$; $r = 0.12$) or threatening voices ($t = 5.25$; $P < 0.001$; $r = 0.28$) than in those without. Higher attachment anxiety was associated with greater severity of voices ($r = 0.29$; $P = 0.014$) and greater distress in relation to voices ($r = 0.32$; $P = 0.005$). Arbuckle et al. (15) found key worker informant reported attachment avoidance was related to auditory hallucinations ($r_s = 0.63$; $P = 0.01$). Furthermore, self-reported attachment avoidance of team relationships was associated with greater duration, frequency, intensity, conviction and disruption of delusional thoughts ($r_s = 0.42$; $P = 0.49$).

Two studies (23, 25) explored associations between symptoms and attachment as measured by the AAI. Dozier et al. (25) found that the participants' greater attachment avoidance was associated with self-reporting fewer psychiatric symptoms (Brief Symptom Inventory, BSI; all $P < 0.05$ but effect sizes not reported). Dozier et al. (23) found that attachment avoidance was associated with lower self-report of psychiatric symptoms using the BSI ($r = -0.23$ to

_____0.41). However, when others rated symptoms, those with avoidant attachment had psychiatric symptoms including conceptual disorganisation ($r = 0.35$), delusions ($r = 0.30$), hallucinations ($r = 0.30$) and suspiciousness ($r = 0.55$). Attachment security was linked to less delusions ($r =$ _____0.33), hallucinations ($r =$ _____0.35) and suspiciousness ($r =$ _____0.41).

When using the AAQ (30), those classified with an avoidant ($t = 3.35$; $P < 0.01$; $r = 0.28$) or preoccupied ($t = 2.01$; $P < 0.05$; $r = 0.12$) attachment style had a greater severity of positive symptoms than those with a secure attachment style. Furthermore, those with avoidant attachment also had more severe negative symptoms ($t = 2.36$; $P < 0.05$; $r = 0.16$) compared to anxious ambivalent or secure attachment styles.

Two studies employed the RQ to explore associations with symptoms. Ponizovsky et al. (31) found that greater severity of delusions was predicted by more preoccupied attachment ($r^2 = 0.06$ – 0.08 ; $P < 0.01$) and more avoidant attachment ($r^2 = 0.05$ – 0.08 ; $P < 0.01$). In addition, greater persecution/suspiciousness was predicted by more preoccupied ($r^2 = 0.20$; $P < 0.0001$) and more avoidant ($r^2 = 0.17$; $P < 0.0001$) attachment. Greater hallucinations were predicted by more avoidant attachment ($r^2 = 0.20$; $P < 0.0001$). Tait et al. (32) found that higher attachment anxiety was associated with more positive symptoms ($r = 0.31$; $P = 0.03$). Quijada et al. (34) did not find any associations between attachment prototypes and psychotic symptoms or functioning although the sample size may not have been sufficient to detect small to moderate effect sizes, which were signalled in the data. Controlling for baseline symptoms and premorbid social adjustment, secure, preoccupied and dismissing attachment accounted for 20.4% of the variance in psychotic symptom change scores (over 6 months). Secure attachment accounted for 19.3% of change in functioning scores over 6 months.

Therefore, to summarise, we find good evidence to support the association between attachment avoidance and psychiatric symptoms in four studies (16, 17, 23, 25), with positive symptoms in six studies (15, 16, 18, 26, 30, 31) and negative symptoms in two studies (16, 30). Questionnaire-based methods find that increased attachment avoidance is associated with increased symptom reporting (15–18, 26, 30, 31), whereas studies using the AAI show that avoidant attachment is associated with reduced reporting of symptoms (23, 25) by participants themselves but now by case managers or family members. We find modest evidence to support an association between attachment anxiety/preoccupation and psychiatric symptoms in one study (16) and positive symptoms in four studies (18, 30–32). No studies have reported associations between attachment and disorganisation symptoms.

Affective symptoms. Three studies (15, 17, 26) explored the PAM in relation to depression and one study (30) in relation to emotion regulation. Arbuckle et al. (15) found an association between greater depression and more attachment avoidance in general ($r_s = 0.41$; $P = 0.046$) and avoidance of key worker relationships specifically ($r_s = 0.55$; $P = 0.01$). Berry et al. (17) found that greater depression was associated with more attachment avoidance ($r = 0.27$; $P = 0.018$) and attachment anxiety ($r = 0.43$; $P < 0.001$). Kvrjic et al. (26) found that depression was associated with attachment anxiety ($r = 0.27$ – 0.41 ; $P < 0.001$) and avoidance ($r = 0.19$ – 0.29 ; $P < 0.03$). Blackburn et al. (19) found that more attachment to services (SAQ) was associated with lower depression ($r =$ ^L 0.37 ; $P = 0.001$).

Quality of life. Three studies explored associations between attachment and quality of life (20, 27, 33). Tyrrell et al. (33) found that greater attachment avoidance was associated with reporting better greater quality of life ($r = 0.38$; $P < 0.01$). In contrast, Couture et al. (20) found that avoidant and preoccupied attachment (ASQ) was associated with lower quality of life ($r = -0.342$ and -0.341 ; $P < 0.01$). Specifically, greater discomfort with closeness ($r = -0.477$; $P < 0.01$), need for approval ($r = -0.267$; $P < 0.05$) and preoccupation with relationships ($r = -0.301$; $P < 0.05$) were associated with lower quality of life. Having more confidence in relationships (ASQ) was associated with improved quality of life ($r = 0.332$; $P < 0.01$). Also worse social and independent living (CASIG) was associated with greater avoidance ($r = 0.241$; $P < 0.05$) and discomfort with closeness ($r = 0.233$; $P < 0.05$), whilst it was better with greater confidence ($r = -0.267$; $P < 0.05$).

MacBeth et al. (27) explored associations between RF, present in AAI narratives and found that higher RF scores (reflecting improved mentalisation) were significantly negatively correlated with WHO-QoL physical quality of life ($r = -0.478$; $P = 0.005$) and psychological quality of life ($r = -0.407$; $P = 0.019$).

Discussion

We sought to identify, summarise and critically evaluate studies that have investigated attachment amongst individuals with psychosis. Specifically, we sought to characterise these studies, explore attachment measurement and investigate evidence construct validity and finally explore associations between attachment and dimensions of outcome in people with psychosis. We identified 22 papers describing 21 studies comprising 1453 participants, with a mean age of 35.0 years (range 12–71 years), of whom 68.4% ($n = 994$) were male. Of our sample, 1112 (76.5%) had a diagnosis of schizophrenia. We identified a number of important methodological problems in the current literature. All of the studies with two exceptions (16, 34) were cross-sectional. All but three studies (20, 27, 34) were conducted with participants with established or chronic psychosis. Reporting of participant flow including rates of consent was rare with the exception of two studies (16, 30). Other reporting problems were noted including the description of inclusion and exclusion criteria, medication, diagnosis and educational level. Finally, data reporting was not consistent, and in particular, there was a tendency in studies to only report significant findings.

Across the 21 studies we identified, there were 7 different measures of attachment were employed including the PAM (54.6%; $n = 793$), AAI (19.3%; $n = 280$), ASQ (11.6%; $n = 169$), RQ (9.0%; $n = 131$), RAAS (3.4%; $n = 50$) and the AAQ (2.1% $n = 30$). One study (19) used the SAQ (5.4%; $n = 78$) in addition to the PAM. Attachment measurement varied from self-report questionnaires (PAM, ASQ, RQ, SAQ, RAAS, AAQ) to semi-structured interviews (AAI) and from dimensional descriptions of attachment (AAI QSort, PAM, ASQ, SAQ, RAAS) to categorical descriptions (AAI, RQ, AAQ). There are also differences in approach each measure uses, whether it is based on the person's current state of mind with respect to attachment as reflected in attachment-related discourse (AAI) or self-reported perceptions of current relationships (52).

Self-report- and interview-based approaches to the assessment of attachment reflect different epistemological traditions with the former emerging from in the context of social psychology and individual differences and the later in the context of developmental psychology. These measurement differences reflect differing approaches to the conceptual and theoretical understanding of attachment. Therefore, both approaches make important contributions to the literature (54–56).

Self-report measures have the advantage of ease of administration but can be subject to biases arising from the attachment system itself where individuals who are avoidant of attachment can tend to self-report their attachment as autonomously secure. Some studies attempted to account for this by using both self-reported and informant reported measures of attachment (15, 16). In addition, the overlapping semantic content between items such on measures of psychosis (e.g. feeling suspicious of others) and measures of attachment (e.g. feeling insecure in relationships) may increase effect size estimates. In contrast, narrative approaches to attachment measurement (AAI) assess the coherence of the portrayal of attachment relationships at the semantic and autobiographical memory level. It is well established that AAI has strong predictive validity with infant attachment security (42, 43). A key criticism of the AAI is the time taken for to train interviewers and complete the AAI is considerably longer than self-report measures. Importantly, self-report measures and the AAI have a very weak association (0.09) (56). Despite this, data from the AAI showing associations with psychotic symptoms (23) are reassuring in that they reflect similar effect size estimates to those found in self-report studies.

Despite these methodological differences arising from the measurement of attachment, we observed remarkable consistency of findings across the studies we identified. We found good evidence supporting the construct validity of attachment measurement amongst individuals with psychosis. Insecure attachment was moderately associated with poorer engagement with services and more interpersonal problems. We also found small to moderate associations between insecure attachment and more negative representations of parental bonding and experiences of trauma. Finally, we found small to moderate associations between insecure attachment and greater positive and negative symptoms, greater depression and poorer quality of life.

An attachment theory conceptualisation of recovery from psychosis. As we stated in the outset of this manuscript, there is now much evidence to show that traumatic experiences contribute towards the development of vulnerability to developing psychosis (1, 2) and that early adversity may impact on later expression of psychosis by increasing stress sensitivity to later stressful life events (3, 4). Our findings that insecure strategies are associated with more negative parental representations (17, 28, 32) and greater trauma (17, 29) are of importance in terms of bringing a developmental understanding of the influence of early trauma and abuse in the development of individuals' patterns of adaptation and coping as reflected in their attachment security. These associations are important as attachment theory provides a framework to understand processes of affect regulation that contributes towards stress sensitivity and coping. Therefore, vulnerability to the development of psychosis might be best understood within the context of this developmentally based affect regulation system. These attachment strategies in turn shape the unfolding of symptom expression and recovery. We found good evidence to suggest that attachment avoidance was associated with psychiatric symptoms, positive symptoms and, to a lesser extent, negative symptoms (15–18, 23, 25, 26, 30, 31).

Recovery from psychosis unfolds in the context of individuals' engagement with services, and it is in the relationships between individuals with psychosis and their service providers that the attachment system expresses itself. Life events involving threat, loss, separation and illness activate the attachment system, and this is reflected in organised (and disorganised) patterns of affect regulation in the context of interpersonal relationships. Thus, the service providers' capacities to provide an attuned response to the needs of individuals in context of their affective expression will determine

the extent to which services can provide a safe haven and secure base for recovery. In this review, we found that those with secure attachment had better engagement and greater treatment adherence (21, 27) and insecure attachment was related to disengagement (30, 32). Specifically, avoidant attachment was related to problems in seeking help, poor use of treatment, longer hospital admissions and lower-rated therapeutic alliance (16, 21, 30) and lack of acceptance and awareness of emotions (35). Preoccupied attachment or attachment anxiety was related to greater disclosure and more treatment adherence than avoidance (21, 26, 27) and greater emotion regulation difficulties (35). Insecure attachment was also related to the amount and type of input offered by clinicians (26). Individuals with dismissing (avoidant) attachment states of mind also experienced greater confusion in response to meeting with their case managers (24). We also found that those with dismissing (avoidant) attachment had difficulties with interpersonal problem-solving, inappropriate or hostile behaviour and had poorer relationships (16, 20, 22, 24, 26, 27).

A key aspect of the attachment system is the individuals' capacity for mentalisation or RF (57, 58). Impoverished RF arising from dismissing (avoidant) attachment (27) creates a challenge for service providers to provide attuned support particularly where the avoidant attachment strategy is deployed in the service of individuals' autonomy and independence at the cost of close interpersonal relationships (including help-seeking) and a more nuanced understandings of thinking, affect and memory. Therefore, attempts by service providers to engage these individuals in mental health services or discuss emotional experiences may be experienced as a threat to this group of individuals. This may trigger disengagement and further resistance. Those with dismissing (avoidant) attachment had more positive and negative symptoms, paranoia and delusions (15–18, 23, 30, 31). Using the AAI, those with attachment avoidance selfreported fewer symptoms but were rated as more symptomatic by others (23, 25). These findings are of importance here. Disengagement in context of continuing symptoms combined with greater difficulties in help-seeking (28, 32) may then provoke more assertive and ultimately coercive service responses. Those with more admissions and compulsory treatment orders had poorer attachment to services (19). Therefore, insecure attachment (particularly dismissing avoidant) may be a key risk feature for the unfolding of problematical recovery, which expresses itself primarily through the individual's interpersonal relationships including those with service providers. In keeping with this, Owens et al. (35) found that attachment anxiety and therapeutic alliance were significant predictors of emotion regulation problems.

Strengths and limitations of current review. The strengths of the current review included the systematic search strategy, the exclusion of nonclinical data and the focus on construct validity and outcomes. All of the studies were rated for risk of bias by two independent raters and a third reviewer. Limitations of our review were the search parameters, for example, written in English language, may have resulted in publication and language bias by overlooking relevant evidence. The measure developed for rating the risk of bias, and quality in included studies was developed specifically for this review based on previously validated measures and standards (13, 14). Therefore, validity of this measure is not established. In addition, the heterogeneity of measures used to assess symptoms and functioning prevented us from applying meta-analytic techniques to the data set. A final major limitation was the bias within the studies tendency to report significant findings.

Research implications. The continuity of attachment stability from infancy through to adulthood remains an important area of investigation. The stability of secure attachment appears quite robust in the context of environments that are stable and psychologically benign. However, significant discontinuities in attachment are observed in high-risk samples that the transition from security to insecurity is accounted for by living in environments characterised by poverty and deprivation, and increased stressful life events. In this context, increasing insecurity or the maintenance of insecurity is associated with challenging life events and environments (59–61). Our findings highlight the importance of attachment theory in understanding the (a) prediction of transition to psychosis in those at risk of developing psychosis and (b) the evolution of recovery in the context of first-episode psychosis. Given the importance of attachment theory as a framework to understand resilience, coping and affect regulation, there is an important task to understand how attachment shapes recovery over time, and for this reason, prospective studies comprising well-characterised ‘at-risk’ and/ or first-episode cohorts are required.

Further research is also required exploring how attachment strategies exert themselves in the context of individuals’ relationships with services and indeed the way in which services respond to these attachment strategies. This interaction between service users and service providers may provide an important lens through which to understand the expression of recovery including its barriers over time. Furthermore, we did not find any studies of attachment and psychosis, which explored individuals’ peer and/or intimate relationships. This appears to be a striking omission in the literature. One recent study (62) found that amongst those with psychosis, friendship network was small, but the quality of friendships was mostly positive and highly valued. The level of emotional commitment to a relationship was more important than psychiatric symptoms in predicting whether or not participants had friends. In addition, larger and more representative sample sizes and replicated studies are required. To improve the transparency of data, there needs to be standardisation in the reporting of significant and non-significant findings. This would help to develop a comprehensive understanding of the ways in which attachment theory relates to processes of recovery from psychosis. Research also needs to investigate whether attachment is a suitable target for psychological therapies and indeed whether it is a desirable or relevant factor amenable to change.

Clinical implications. The data outlined in this systematic review signal an important conceptual shift in understanding and formulation individuals’ engagement with mental health services. Current understandings of engagement, which emphasise concepts such as collaboration, adherence and help-seeking (32) or task, bonds and goals (63) could be enhanced by understanding engagement from an attachment-based perspective. For example, Goodwin et al. (50) emphasise importance of safe haven in their measure of service attachment. However, features of secure attachment emphasise both safe haven (for expression of distress) and secure base (for promoting autonomy, exploration and curiosity). From a developmental stance, it is this interplay between safe haven and secure base, which underpins freely autonomous and secure attachment (41, 46). Arguably secure base behaviour as reflected in recovery orientation (36) was a better predictor of therapeutic alliance than attachment avoidance.

These results highlight the importance of understanding attachment as part of an assessment and to utilise attachment theory to understand processes of affect regulation and recovery. Attachment theory is a model of resilience, not a model of psychopathology and contributes to the formulation

of an individual's affective, cognitive and interpersonal functioning. This would provide hypotheses regarding the interpersonal interactions during intervention that would benefit those with insecure attachment, for example avoidant attachment may benefit from increasing focus on emotion (33), and also highlight the importance of integrating interpersonal interventions into existing evidence-based practice.

Furthermore, attachment theory may also be useful to understand the relationship between staff, service users' and the team and provide a theoretical model to incorporate the interplay between developmental, interpersonal, coping and systemic factors as their influence and are influenced by the functioning of clinical services. This would inform the therapeutic alliance and offer a way of conceptualising barriers to engagement or interpersonal difficulties within a model of resilience. In addition, it may help staff to reflect on their own interpersonal style and influence on service users, including the importance of creating a safe haven for distress and a secure base exploration and recovery.

In conclusion, this review has considered how attachment has been measured and related to outcomes in psychosis. We found evidence to support the construct validity of attachment in people with psychosis and also evidence of small to moderate effect sizes that attachment (in)security is related to positive and negative symptom severity, severity of depression and quality of life. We also found significant methodological challenges in the literature, which mean that researchers and clinicians need to be cautious in generalising from these studies. Despite this, attachment does provide a promising construct for understanding and measuring the developmental and interpersonal origins of resilience and affect regulation, and further research is merited particularly in larger, more representative, first-episode and/or 'at-risk' populations in the context of prospective follow-up.