BJPsych | The British Journal of Psychiatry (2014)
205, 60–67. doi: 10.1192/bjp.bp.113.126722

Insight, duration of untreated psychosis and attachment in first-episode psychosis: prospective study of psychiatric recovery over 12-month follow-up

A. I. Gumley, M. Schwannauer, A. Macbeth, R. Fisher, S. Clark, L. Rattrie, G. Fraser, R. McCabe, A. Blair, K. Davidson and M. Birchwood

Background
Increasing evidence shows attachment security influences symptom expression and adaptation in people diagnosed with schizophrenia and other psychoses.

Aims
To describe the distribution of secure and insecure attachment in a cohort of individuals with first-episode psychosis, and to explore the relationship between attachment security and recovery from positive and negative symptoms in the first 12 months.

Method
The study was a prospective 12-month cohort study. The role of attachment, duration of untreated psychosis (DUP), baseline symptoms and insight in predicting and mediating recovery from symptoms was investigated using multiple regression analysis and path analysis.

Results
Of the 79 participants, 54 completed the Adult Attachment Interview (AAI): 37 (68.5%) were classified as insecure, of which 26 (48.1%) were insecure/dismissing and 11 (20.4%) insecure preoccupied. Both DUP and insight predicted recovery from positive symptoms at 12 months. Attachment security, DUP and insight predicted recovery from negative symptoms at 12 months.

Conclusions
Attachment is an important construct contributing to understanding and development of interventions promoting recovery following first-episode psychosis.

Declaration of interest
None.

Adverse developmental experiences including abuse, deprivation and loss are well-established risk factors for psychosis.[1] Early adversity has an impact on later expression of psychosis by increasing stress sensitivity to later stressful life events.[2,3] Attachment theory[4] has been successful in understanding adaptation to the long-term impact of adverse developmental experiences and stressful life events.[5] Attachment security is a significant building block to resilience and is linked to successful adaptation and recovery in the context of adversity.[6] 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). In adulthood, attachment security is characterised by freedom and autonomy to reflect on and explore painful feelings, and a valuing of interpersonal relationships. In adulthood, insecure attachment is reflected in two predominant strategies relating to adaptation and affect regulation. Preoccupied attachment is characterised by rumination, confusion and heightened emotional expression. Dismissing attachment is characterised by minimising and down-playing of attachment-related experiences, emotions, thoughts and memories. Dismissing attachment has been referred to as avoidant attachment.[7] A recent systematic review[7] of 21 studies comprising 1453 participants established the validity of attachment research in psychosis. Attachment security is associated with improved engagement with services, fewer interpersonal problems and reduced trauma. Attachment security is associated with fewer positive and negative symptoms and lower affective symptoms. However, the use of chronic, cross-sectional convenience samples limits the generalisability of findings. Our study was designed to provide a prospective study of attachment and its relationship with psychiatric recovery over time. The study aimed to establish the distribution of secure and insecure attachments in a cohort of individuals with first-episode psychosis, and to explore the relationship between attachment and recovery from positive and negative symptoms in the first 12-months following initiation of treatment. Our hypotheses were (a) that most individuals with a first episode of psychosis would be classified as insecure in their attachment; and (b) that controlling for symptomatology, duration of untreated psychosis (DUP) and psychiatric insight, greater attachment security would predict better recovery from positive and negative symptoms.

Method

The study was a 12-month prospective study of individuals with first-episode psychosis. Ethical (REC: 04/S0703/91) and research governance approval was granted before the start of the study. The study was conducted between 1 September 2006 and 31 August 2009.

Participants

Recruitment took place in National Health Service (NHS) mental health services in Glasgow and Edinburgh. All potential participants were approached for informed consent. Inclusion criteria were: (a) in-patients or out-patients with (b) first presentation to mental health services for psychosis, (c) DSM-IV criteria for schizophrenia, schizophreniform disorder, schizo-affective disorder, delusional disorder or bipolar disorder.[8] Members of the clinical teams providing their care identified individuals meeting these criteria and an invitation to participate in the research was extended by a member of the research team.

Participation was voluntary and following receipt of informed and written consent participants were entered into the study.

Measures

All diagnoses were confirmed according to DSM-IV criteria[8] based on semi-structured interviews completed by research assistants. The two principal authors (A.I.G. and M.S.) then made diagnostic decisions at monthly research meetings. Severity of psychiatric symptoms was assessed using the Positive and Negative Syndrome Scale (PANSS),[9] a 30-item semi-structured interview for psychotic symptomatology. We examined two measures of outcome based on the PANSS scale: positive and negative symptoms, and PANSS assessments were conducted following entry to the service and at 6-month and 12-month follow-up. The PANSS assessments were rated by the principal authors (A.I.G. and M.S.), to establish interrater reliability at the outset of the study. We repeated checks on a 6-monthly basis to ensure continuing reliability over the course of the study. All estimates of reliability were above rho (ρ) = 0.80. For analysis of insight we utilised the insight item (G12) from the PANSS. A higher score on this item reflects less acceptance and insight into having a psychiatric illness and needing treatment. Ceskova *et al*[10] have demonstrated the validity of the PANSS insight (G12) item in first-episode psychosis.

Information about onset and development of psychotic symptomatology[11,12] was collected from the individual and (where possible) a carer or loved one. The DUP (interval between onset of psychotic symptomatology and onset of treatment) was calculated using the methods of Skeate *et al*.[12] The test–retest reliability was reported as good (intraclass coefficient $r = 0.96$, $P < 0.01$). Each participant was administered a semi-structured interview to ascertain the age at onset of any psychiatric symptoms and onset of psychotic symptoms. The DUP was calculated from the time of onset of the first psychotic symptoms of the presenting episode to the time of having received antipsychotic therapy for a period of 2 months, unless significant response to medication was achieved earlier. In cases where the first onset of psychotic symptoms was not linked with the presenting episode and there were one or more brief episodes of psychotic symptoms separated by long periods of remission only the periods of active psychotic symptoms were included in the calculation of DUP. In this study, estimation of DUP was assisted by diagrammatically charting it on a timeline specifying the interaction between life events, symptoms, social support and help-seeking. Timelines were constructed collaboratively and shared directly with participants to aid clarification and understanding. Timelines were shared for discussion at monthly research team meetings where DUP for each participant was agreed. Where exact dates were unavailable the middle date of the calendar month was taken as the date of onset.

The Adult Attachment Interview (AAI)[13] 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. Each interview is transcribed verbatim and coded for attachment status by coders trained and reliable in the AAI coding system (Version 7.1).[13] Specifically, coherence of transcript (CohT) is an overall indication of the quality of the narrative throughout the transcripts both reflecting on the participant's probable attachment experiences during childhood (for example loving, neglecting, rejecting), attachment-related experiences (including illness, separation, abuse and loss) and the participant's state mind with respect to these experiences (i.e. secure, dismissing and preoccupied) as reflected in the transcript. The CohT is scored on a scale of 1 to 9, with higher scores indicating greater levels of coherence of discourse; this is the key index of attachment security, which is defined as the degree to which speakers portray their attachment experiences in a coherent and collaborative manner.[13] Macbeth and colleagues[14] have demonstrated the validity of the AAI in a first-episode psychosis sample.

Transcripts are allocated one of three 'organised' categories: one 'secure' category – 'freely autonomous and secure' and two 'insecure' categories – 'dismissing' and 'preoccupied'. Based on the AAI manual, individuals scoring 5 are allocated to the freely autonomous and secure attachment classification. Individuals classified as freely autonomous and secure tend to value attachment relationships, regard attachment experiences as influential, appear relatively independent and autonomous and appear free to explore both positive and painful thoughts and feelings. Individuals classified as dismissing tend to limit the influence of attachment-related experiences by denying, closing down or minimising these experiences. These individuals will often implicitly claim strength, normality and independence and provide a very positive description of early development, which is not substantiated by episodic memories. Individuals classified as preoccupied often appear confused. Discussions of attachment and other relational experiences are often prolonged, vague and uncritical or angry and conflicted and overwhelmed by trauma and loss. In addition, transcripts can be assigned a fourth category of 'unresolved' with regard to trauma and loss, where the coherence of an interviewee's narrative breaks down in relation to discussions regarding trauma and loss. Where there was the presence of two or more contradictory attachment strategies a 'cannot classify' is assigned to these transcripts denoting a global breakdown in discourse and alternating use of attachment strategies.[15]

Safeguards were included in the research protocol to ensure that the AAI was not conducted when participants were acutely psychotic or thought disordered. To enable interviewers and participants to establish rapport, lengthy interviews containing other baseline assessments including PANSS and DUP were always completed prior to the AAI. Since threats to validity of CohT arise from the presence of psychotic symptoms such as delusions and hallucinations, the CohT score can be adjusted to take account of these violations of narrative by assigning a coherence of mind (CohM) score. In our sample the association between CohT and CohM was $r = 0.98$. Interview stability has been reported as 90% at 3 months (kappa (κ) = 0.79).[16] After data collection for the study was completed, transcripts were coded by two researchers (A.M. and R.F.) with certified reliability in 3-category AAI classifications by Mary Main and Erik Hesse.[13]

Data analysis

We proposed linear multiple regressions incorporating two covariates (age and gender) and four predictors (corresponding baseline symptoms, DUP, baseline insight and CohT). For our analyses we used the CohT score as our measure of attachment security, with higher scores indicating greater security of attachment. The planned analyses consisted of two sets of linear multiple regressions in which all predictors and covariates were entered independently into the regression algorithm to avoid artificial inflation of estimated R^2. In addition to the regression, path analysis was also performed as part of our planned analysis. Path analysis is an appropriate way of approaching our hypothesis that attachment security, DUP and insight play a role in the symptomatic recovery of patients with first-episode psychosis. This method is well suited for testing interactions between independent variables and their effect on the dependent variable. Path analysis also enables the estimate of overall fit of the hypothesised models on the data. Owing to the relatively small

https://doi.org/10.1192/bjp.bp.113.126722 Published online by Cambridge University Press

sample size, the path models were constructed from observed variables.

We calculated the sensitivity of estimated effect sizes and power for these procedures using Sample Power 2.0[17] and Gpower 3.0 on Mac.[18] We conservatively estimated that a small effect size for the set of covariates and a medium effect size for the set of predictor variables would achieve power of 0.88 with a sample of $n = 60$. A sample $n = 51$ would give us a power of 0.80 using the same parameters. We conducted a sensitivity analysis of the sample size required to detect significant changes in R^2 assuming an effect size range of $f^2 = 0.2$–0.3. Estimation of a medium effect size was based on meta-analytic data on the strength of relationship between DUP and psychiatric symptomatology.[19] We also adopted a medium effect size to denote a clinically significant magnitude of effect to reflect health services practice and service design.

The regression analyses provided an overall estimate of the contribution of our predictors with clinical outcomes. For the regression analyses we transformed DUP using Log 10. For the regression models for PANSS positive and negative symptoms (at 6- and 12-months) we entered the covariates gender and age as well as the four predictors of respective baseline symptoms, ^{Log10}DUP, PANSS insight and CohT. Collinearity statistics for all linear regression models reported below were satisfactory, with tolerance generally above 0.1 and variance inflation factor (VIF: an indicator of severity of multicollinearity) statistics smaller than 10. All regression models were tested via bootstrapping with 1000 random samples; this method involved generating confidence intervals through a process of random resampling. The bootstrapped solutions confirmed the linear regression models.

Following the regression analyses, the path analyses provided an understanding of the interaction of these predictors to clinical outcomes. To test hypothesised direct and indirect effects we utilised structural equation modelling (SEM) using EQS version 6.1 on Windows[20] to test the path models. The SEM-based approach to testing mediation was chosen as it provides two key advantages over alternate methods: it tests the hypothesised parameters simultaneously and it provides an indication of the overall fit of the model.[22] The SEM-based approaches based on observed variables only is further more robust in smaller samples but can carry a conservative bias of models not converging.[23] Goodness of fit of all models was evaluated using the Satorra–Bentler robust fit statistics. The maximum likelihood χ^2 statistic was corrected with the Satorra–Bentler robust χ^2 statistic (S–B χ^2) and the robust comparative fit index (RCFI).[24] Chi-squared is the most commonly used measure of model fit – a high chi-squared value with a significant *P*-value suggests a poor fit of the model to the data. The RCFI ranges from 0 to 1 with values greater than 0.90 indicating a good fit. The root mean square of approximation (RMSEA)[25] is a measure of fit that takes into account a model's complexity where a RMSEA of 0.05 or less indicates a good model fit.

Covariance SEM was utilised to examine the goodness of fit of two *a priori* models relating PANSS outcome variables at 12 months of positive and negative symptoms respectively to the predictor variables: DUP, PANSS insight, CohT and the respective baseline symptoms variable. For all path models we systematically tested direct and mediating effects of the main hypothesised mediating factors.

Results

Participant flow

The participant flow is illustrated in Fig. 1. Of the 102 participants eligible for consent, 79 were entered into the study of whom 74 were followed up at 6 months and 68 at 12 months.

Basic demographic and clinical characteristics

Table 1 shows the demographic and clinical characteristics of our sample. The mean age of the sample was 24.64 (s.d. = 7.08) years; 54 (68.4%) were male, 38 (52.1%) had a diagnosis of

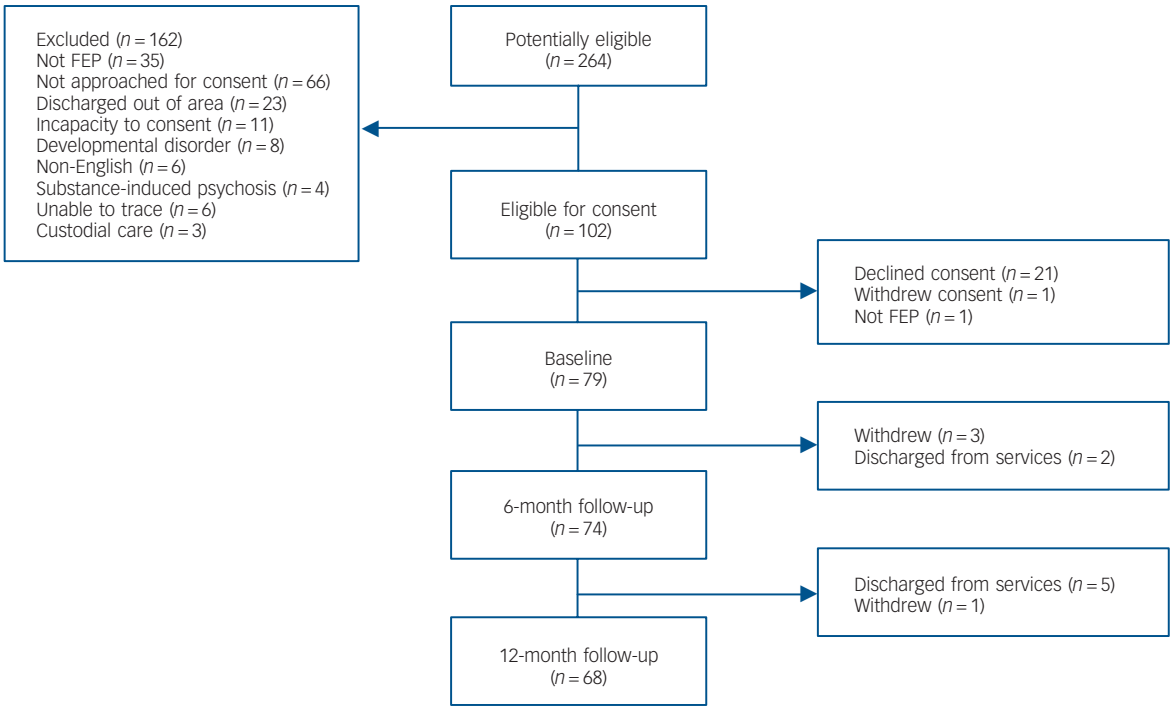

Fig. 1 Participant flow.

FEP, first-episode psychosis.

https://doi.org/10.1192/bjp.bp.113.126722 Published online by Cambridge University Press

Table 1 Basic demographic and clinical characteristics

Characteristic	
Gender, *n* (%)	79
Male	54 (68.4)
Female	25 (31.6)
Diagnosis, *n* (%)	73
Schizophrenia	38 (52.1)
Schizophreniform disorder	2 (2.7)
Schizoaffective disorder	8 (11.0)
Delusional disorder	1 (1.4)
Bipolar disorder	19 (26.0)
Other	5 (6.8)
Admission at first episode, *n* (%)	78
Yes	40 (51.3)
No	38 (48.7)
Detained in hospital at first-episode psychosis, *n* (%)	77
Yes	20 (26.0)
No	57 (74.0)
Age at first contact, years: *n*	79
Mean (s.d.) median (IQR)	24.64 (7.08) 22 (10.75)
Duration of untreated psychosis, weeks: *n*	71
Mean (s.d.) median (IQR)	44.37 (73.96) 16 (60)
Positive and Negative Syndrome Scale, *n*	79
Baseline, mean (s.d.) median (IQR)	
Positive	20.82 (7.39) 20.5 (11)
Negative	15.07 (8.31) 12 (10)
Insight	3.17 (1.87) 3 (2.75)
Total	74.43 (21.50) 71 (27.75)
6 months, mean (s.d.) median (IQR)	
Positive	11.57 (5.68) 10 (6)
Negative	13 (6.62) 11 (8.5)
Insight	2.46 (1.77) 2 (3.0)
Total	52.88 (17.86) 48 (25.25)
12 months, mean (s.d.) median (IQR)	
Positive	10.7 (4.9) 9 (5)
Negative	11.68 (7.05) 8 (9)
Insight	2.18 (1.71) 1 (2.0)
Total	47.78 (18.78) 42 (23)

schizophrenia. The sample had a median DUP of 16 weeks. We observed significant improvements in PANSS positive symptoms over 12 months ($t = 10.91$, $P < 0.001$) and PANSS negative symptoms over 12 months ($t = 2.6$, $P < 0.012$).

Attachment organisation

In our sample we were able to complete a total of 54 (63.4%) AAIs. Table 2 illustrates three-way (secure/autonomous, insecure dismissing, insecure preoccupied), four-way (including those unresolved for trauma and/or loss) and five-way (for the new and emergent cannot classify category) classifications: 68.5% were classified as insecure, of which 48.1% were dismissing and 20.4% preoccupied. We also show CohT scores for the three-way categorisation. Overall there was a statistically significant difference between the three groups ($F(2,51) = 83.2$, $P < 0.001$), which was accounted for by statistically significant differences between the secure autonomous group and the insecure dismissing ($P < 0.001$) and insecure preoccupied ($P < 0.001$). There were no differences between the two insecure groups. Seventeen (31.5%) of the transcripts were classified as unresolved for trauma and/or loss. Six (11.1%) of the transcripts were categorised as cannot classify. Details of subcategories can be found in online Table DS1.

We found no significant correlation between CohT and PANSS conceptual disorganisation at baseline ($r = -0.19$), 6 months ($r = 0.12$) or 12 months ($r = -0.07$). We explored three-way attachment categorisation in relation to PANSS positive, negative, general symptoms and DUP. Multivariate analysis of variance revealed significant effects for three-way attachment categorisation for PANSS positive at entry ($F = 4.66$, $P = 0.015$) and PANSS positive at 6 months ($F = 4.71$, $P = 0.014$). *Post hoc* Sheffé analysis revealed that the insecure preoccupied group had higher positive symptoms at entry ($P = 0.017$) and at 6 months ($P = 0.027$) compared with the freely autonomous and secure group.

Predictors of psychiatric recovery and remission

Prior to formal analyses we examined correlations between predictor variables (^{Log10}DUP, PANSS Insight, CohT), covariates (baseline PANSS positive and negative) and the key outcome variables at 12 months (PANSS positive and negative). All models were replicated for 6-month outcomes and were largely consistent with 12-month results. Table 3 shows these correlations, indicating significant associations between PANSS positive symptoms and PANSS negative symptoms and the key predictor variables insight, DUP and AAI CohT.

Recovery: positive symptoms

All final regression models are summarised in Table 4. For PANSS positive symptoms at 6 months the overall regression model accounted for 30.9% of the variance ($F(50) = 3.28$, $P = 0.009$). The significant predictor variables for positive symptoms at 6 months were DUP ($\beta = 0.280$, $t = 2.14$, $P = 0.038$) and insight as measured by the PANSS ($\beta = 0.388$, $t = 2.34$, $P = 0.023$). The AAI CohT was not a significant predictor. For PANSS positive symptoms at 12 months the linear regression model accounted for 27.6% of the variance ($F(48) = 2.66$, $P = 0.028$). In the regression model the only significant predictor variable for PANSS positive symptoms at 12 months was insight ($\beta = 0.396$, $t = 2.28$, $P = 0.027$). The AAI CohT was not a significant predictor.

Recovery: negative symptoms

The linear regression model (Table 4) explained 61.1% of PANSS negative symptoms at 6 months ($F(49) = 11.28$, $P < 0.001$). Significant predictor variables for negative symptoms

Table 2 Summary of Adult Attachment Interview (AAI) category for three-, four- and five-way analysis

	Three-way			
AAI category	CohT, mean (s.d.)	*n* (%)	Four-way, *n* (%)	Five-way, *n* (%)
Secure: autonomous	6.1 (1.2)	17 (31.5)	12 (22.2)	12 (22.2)
Insecure: dismissing	2.4 (0.9)	26 (48.1)	21 (38.9)	20 (37.0)
Insecure: preoccupied	2.3 (0.8)	11 (20.4)	4 (7.4)	3 (5.6)
Unresolved			17 (31.5)	13 (24.1)
Cannot classify				6 (11.1)

CohT, coherence of transcript.

https://doi.org/10.1192/bjp.bp.113.126722 Published online by Cambridge University Press

Table 3 Correlations between predictors, covariates and dependent variables

	6-month follow-up		12-month follow-up	
	PANSS positive	PANSS negative	PANSS positive	PANSS negative
Predictors				
DUP (Log_{10})	0.42**	0.24	0.26*	0.13
PANSS insight	0.43**	0.36**	0.31*	0.44**
AAI coherence of transcript	−0.18	−0.43**	−0.13	−0.33*
Covariates				
Baseline PANSS positive	0.26*	0.16	0.17	0.14
Baseline PANSS negative	0.26*	0.60**	0.28*	0.55**

PANSS, Positive and Negative Syndrome Scale; DUP, duration of untreated psychosis; AAI, Adult Attachment Interview.
**$P<0.01$, *$P<0.05$.

Table 4 Predictors of recovery: Positive and Negative Syndrome Scale (PANSS) positive and negative symptoms at 6 and 12 months

Dependent and independent variables	β	*t*	*P*	R^2 (complete model)
PANSS positive at 6 months				
Age	0.168	1.25	0.218	0.309**
Gender	−0.060	−0.46	0.626	
Duration of untreated psychosis	0.280	2.14	0.038*	
PANSS insight	0.388	2.34	0.023*	
AAI coherence	−0.142	−1.05	0.299	
Baseline PANSS positive	−0.044	−0.27	0.788	
PANSS positive at 12 months				
Age	0.148	1.05	0.299	0.276*
Gender	−0.174	−1.28	0.208	
Duration of untreated psychosis	0.243	1.77	0.083	
PANSS insight	0.396	2.28	0.027*	
AAI coherence	−0.031	−0.21	0.829	
Baseline PANSS positive	−0.001	−0.05	0.996	
PANSS negative at 6 months				
Age	0.095	0.928	0.359	0.611**
Gender	0.030	0.309	0.759	
Duration of untreated psychosis	0.183	1.85	0.070	
PANSS insight	0.131	1.17	0.245	
AAI coherence	−0.245	−2.30	0.026*	
Baseline PANSS negative	0.522	4.62	0.001**	
PANSS negative at 12 months				
Age	0.125	0.978	0.339	0.403**
Gender	−0.027	−0.219	0.828	
Duration of untreated psychosis	0.159	1.27	0.210	
PANSS insight	0.312	2.20	0.033*	
AAI coherence	−0.307	−2.28	0.028*	
Baseline PANSS negative	0.141	0.985	0.330	

AAI, Adult Attachment Interview.
**$P<0.01$, *$P<0.05$.

at 6 months were AAI CohT (β = –0.245, $t = –2.30$, $P = 0.026$) and PANSS negative symptoms at baseline (β = 0.522, $t = 4.62$, $P < 0.001$). For negative symptoms at 12 months the linear regression model overall accounted for 40.3% of the variance ($F(47) = 4.62$, $P = 0.001$). The predictor variables for negative symptoms at 12 months were baseline insight as measured by the PANSS (β = 0.312, $t = 2.20$, $P = 0.033$) and AAI CohT (β = −0.307, $t = −2.28$, $P = 0.028$).

PANSS positive symptoms, path model

The hypothesised mediation model with associated fit indices is displayed in Fig. 2. This model fitted the data well (S–B $\chi^2 = 13.82$, $P = 0.061$; RCFI = 0.973; RMSEA = 0.051, RMSEA 90% CI 0.042–0.059). All direct and indirect paths were included in the analysis. Both PANSS insight at baseline and DUP had a direct effect on PANSS positive symptoms at 12 months. There were no significant direct effects of AAI CohT and baseline PANSS positive symptoms as suggested by the linear regression model. However, the path model clearly demonstrated a fully mediated relationship between attachment and positive symptoms at 12 months with insight and DUP acting as mediators, and a partial mediation of DUP and positive symptoms, with insight being a significant partial mediator, thus strengthening the association between DUP and symptoms at 12 months overall. It is also of interest to note that AAI CohT had a significant direct effect on DUP.

PANSS negative symptoms, path model

This model also fit the data well (S–B $\chi^2 = 9.89$, $P = 0.094$; RCFI = 0.926, RMSEA = 0.042, RMSEA 90% CI 0.037–0.046). The hypothesised mediation model with associated fit indices is displayed in Fig. 3. All direct and indirect paths were included in the analysis. Both PANSS insight at baseline and DUP had significant direct effects on negative symptoms; small significant

https://doi.org/10.1192/bjp.bp.113.126722 Published online by Cambridge University Press

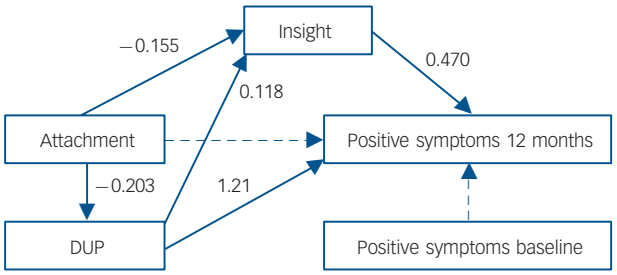

Fig. 2 Mediation model, Positive and Negative Syndrome Scale (PANSS) positive symptoms at 12 months.

$\chi^2 = 13.82$ ($P = 0.061$); robust comparative fit index (RCFI) = 0.973; root mean square of approximation (RMSEA) = 0.05. DUP, duration of untreated psychosis.

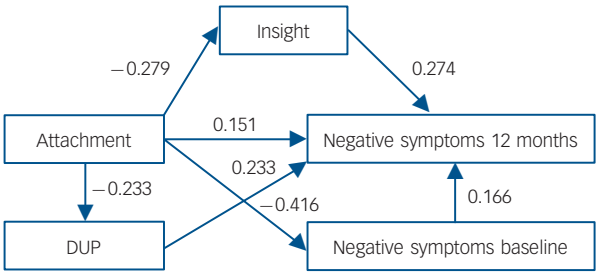

Fig. 3 Mediation model, Positive and Negative Syndrome Scale (PANSS) negative symptoms at 12 months.

$\chi^2 = 9.89$ ($P = 0.094$); robust comparative fit index (RCFI) = 0.926; root mean square of approximation (RMSEA) = 0.04. DUP, duration of untreated psychosis.

effects could be observed for PANSS baseline negative symptoms and CohT. We observed clear mediation effects whereby CohT had strong effects on insight, DUP and in particular baseline negative symptoms, each of which directly affected PANSS negative symptoms at 12 months. The effect of CohT on negative symptoms at 12 months was therefore partially mediated by its effect on baseline negative symptoms, DUP and insight.

Discussion

First, we aimed to establish the distribution of attachment representations in a cohort of individuals with first-episode psychosis. In line with our hypothesis, we found most participants were insecure in their attachment ($n = 37$, 68.5%); 26 (48.1%) were classified as dismissing and 11 as preoccupied (20.4%). Rates of unresolved attachment were 31.5% ($n = 17$). Significantly, most of our preoccupied group was also classified as unresolved for loss. These data are consistent with previous findings reported by MacBeth and colleagues[14] but differ from Dozier *et al*'s[26] finding that most of their chronic group were dismissing of attachment.

Second, we explored the relationship between attachment and recovery from positive and negative symptoms in the first 12 months. In terms of recovery from positive symptoms at 6 months we found that baseline PANSS positive and insight were significant predictors, however, at 12 months only insight remained significant. Contrary to our hypothesis, we did not find that attachment predicted positive symptom recovery. Previous studies have shown an association between attachment and positive symptoms, particularly for dismissing attachment.[7] However, these studies differ from the current study in that they use self-report methods, were conducted in chronic samples and tended to report bivariate associations. In addition, clinically important interaction effects between covariates tend to be masked in the linear regression models. In light of this, the findings of our positive symptoms path model are of interest. We found that increasing attachment security was associated with better insight at baseline and shorter DUP and the relationship between attachment and PANSS positive symptoms at 12 months was fully mediated by insight at baseline and DUP. These findings suggest that attachment security may exert an influence on the recovery from positive symptoms by acting on DUP and insight.

In terms of recovery from negative symptoms, attachment and baseline insight predicted recovery from negative symptoms at both 6 and 12 months. Path analyses demonstrated a small significant direct relationship between attachment and outcome of negative symptoms. In addition, the relationship between attachment and negative symptoms was partially mediated by insight and negative symptoms at baseline. Previous studies have also shown mixed results for the relationship between attachment and negative symptoms.[7] Unlike these studies we measured attachment using the AAI. The AAI provides an assessment of affect regulation during the discussion of salient interpersonal experiences. We note that the majority of our participants were insecure in their attachment and that almost half were dismissing. Attachment avoidance has been linked to the deactivation of positive and negative affect, interpersonal distancing, impaired mentalisation, avoidance of affect-linked autobiographical memories and a lack of trusting and confiding relationships.[27] Therefore the association with negative symptoms is of interest particularly in light of the lower levels of recovery in this outcome domain. One hypothesis would suggest that attachment processes may have a role in the unfolding of negative symptoms and that deactivation strategies linked to insecure attachment may be linked to the deactivation of positive and negative affect. Our findings in relation to positive symptom outcomes are consistent with this 'affect regulation hypothesis'. Attachment security exerted an influence on positive symptom recovery via shorter DUP and higher insight. Attachment security is a marker for resilience and is characterised by openness to seeking help (shorter DUP) when distressed and greater awareness of thoughts, feelings and memories (improved insight). We also noted that 31% of our sample were unresolved for attachment and, further, 11% showed a global breakdown of attachment strategies (cannot classify). Given that both unresolved and cannot classify are closely linked to interpersonal trauma and loss, further research in this area would help clarify important relationships between trauma, attachment and outcome in psychosis.[1]

We note that the neurobiology of attachment is increasingly understood through the role of dopamine and oxytocin circuitry.[28] It has been proposed that difficulties in social cognition are underpinned by disruption in the amygdala and the dopamine and oxytocin circuitry linked to socio-emotional processing, which are also implicated in schizophrenia.[29] Attachment theory therefore provides a framework to link models of affect regulation and adaption, impairments in social cognition and neurobiological mechanisms underpinning recovery following first-episode psychosis.

Limitations

Our study has some important limitations. We note that the choice of SEM for the investigation of indirect and mediating effects in a moderate sample like ours has some drawbacks. It offers a conservative method that forced use of observed rather than latent constructs, limiting the complexity of the associations

https://doi.org/10.1192/bjp.bp.113.126722 Published online by Cambridge University Press

that we were able to investigate. However, it also offered clear advantages in that we were able to assess the overall fit of the model as well as the strength of the associations and interactions between the variables. The analysis further highlights clearly significant and meaningful interaction effects that are masked in the linear regression models.

The direct relationship between attachment and negative symptoms does not allow us to infer causality. It may be that negative symptoms themselves impact on our measure of attachment security through impairments in memory functioning. Aleman and colleagues[30] found a small but statistically significant association between negative symptoms and memory. This was across a range of memory domains including immediate and delayed recall of verbal and non-verbal behaviour and was not specific to measures of autobiographical memory relevant to attachment functioning. In contrast, there is increasing evidence to show that autobiographical memory impairment in schizophrenia is related to experience of trauma.[31] In this model, some negative symptoms may arise from the attachment system's regulation of negative affect through truncated recall of affect laden autobiographical memory related to attachment-related experiences that would also include loss and trauma experiences.

We did not utilise a self-report measure of attachment. However, Berry *et al*[32] have noted that patients' retrospective reports of attachment experiences may be subject to biases arising from the attachment system itself, meaning that individuals who are dismissing in their attachment are motivated to present their experiences as normalised and secure. Their comment that 'the desynchrony between semantic and episodic portrayal of attachment-related experiences is used to assess attachment on the empirically robust Adult Attachment Interview' overcomes the aforementioned problem and is a strength of this study.

We did not measure premorbid functioning in our analyses. In a systematic review of the literature,[33] premorbid adjustment had a modest effect on negative symptoms. However, the effects on positive symptoms were negligible. Future studies should focus on the relationships between premorbid social and academic functioning and its relationship to attachment and outcome.

We also note that individuals who declined consent may have been more likely to have difficulties related to their engagement with services. Therefore our sample may underestimate the prevalence of insecure and possibly insecure dismissing attachment in individuals with first-episode psychosis. It has been previously shown that clients with dismissing attachment pose particular challenges for engagement with keyworkers.[7] Insecure attachment (particularly dismissing) 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. Consistent with this, Owens and colleagues[34] found that attachment anxiety and therapeutic alliance were significant predictors of emotion regulation problems in people diagnosed with schizophrenia. Further research is clearly merited in this area.

Clinical implications

Attachment insecurity and the associated diminished capacity to understand and reflect on one's own thoughts and those of others (metacognition)[14] has been linked to impaired functioning[35] and is also associated with a history of sexual abuse.[36] Brune[37] has found that poorer levels of metacognition are related to more negative symptoms. The central finding of this study, that attachment is a consistent predictor of persisting negative symptoms, is important in the context of its applications to psychological treatments and models of mental healthcare for this group. We believe that this indicates a heightened importance of interpersonal processes and behaviours as a target for psychological therapies for psychosis. We note that the majority of our participants were insecure in their attachment organisation and that almost half of our participants were insecure/dismissing. As noted above, this particular attachment strategy has been linked to deactivation of positive and negative affect, distancing, impaired mentalisation, avoidance of thinking about autobiographical events and a lack of trusting and confiding relationships. Attachment as measured by the AAI provides an assessment of affect (dys)regulation that can contaminate interpersonal experiences; the association with negative symptoms is of interest particularly in light of the lower levels of recovery in this outcome domain. This has clear implications for current psychological treatment models, which tend to focus on levels of deficit rather than processes of adaptation to interpersonal challenge. Greater efficacy in psychological treatments for psychosis might therefore be achieved by a clear integration of interpersonal and metacognitive aspects of the client's adaptation to emotionally salient interpersonal events. Attachment provides a framework to understand processes of affect regulation and recovery. In particular, we identify that those individuals with dismissing attachment may well be particularly vulnerable to problematic adaptation via impoverished reflexivity and avoidant coping.[38]

A. I. Gumley, BA(Hons), MAppSci, PhD, AFBPsS, CPsychol, Institute of Health and Wellbeing, University of Glasgow, and ESTEEM First Episode Psychosis Service, NHS Greater Glasgow and Clyde, Glasgow; **M. Schwannauer**, MA, DPsych, PhD, Department of Clinical & Health Psychology, University of Edinburgh, Edinburgh, and Early Psychosis Support Service, NHS Lothian, Edinburgh; **A. Macbeth**, DClinPsy, PhD, Institute of Health and Wellbeing, University of Glasgow, Glasgow, and Institute of Medical Sciences, University of Aberdeen, Aberdeen; **R. Fisher**, PhD, Early Psychosis Support Service, NHS Lothian, Edinburgh, and Department of Clinical & Health Psychology, University of Edinburgh, Edinburgh; **S. Clark**, MA(Hons), DClinPsychol, ESTEEM First Episode Psychosis Service, NHS Greater Glasgow and Clyde, Glasgow; **L. Rattrie**, BSc(Hons), MSc, PhD, Institute of Health and Wellbeing, University of Glasgow, Glasgow; **G. Fraser**, MSc, Early Psychosis Support Service, NHS Lothian, Edinburgh; **R. McCabe**, MBChB, MPhil, FRCPsych, Early Psychosis Support Service, NHS Lothian, Edinburgh; **A. Blair**, FRCPsych, ESTEEM First Episode Psychosis Service, NHS Greater Glasgow and Clyde, Glasgow; **K. Davidson**, MA, MPhil, PhD, FBPsS, CPsychol, Institute of Health and Wellbeing University of Glasgow, and Glasgow Institute for Psychosocial Interventions, NHS Greater Glasgow and Clyde, Glasgow; **M. Birchwood**, BSc, PhD, DSc, FBPsS, Warwick Medical School, University of Warwick, Warwick, UK

Correspondence: Andrew I. Gumley, Chair of Psychological Therapy, Institute of Health and Wellbeing, Mental Health and Wellbeing Research Group, University of Glasgow, Academic Centre, Glasgow, UK. Email: andrew.gumley@glasgow.ac.uk

First received 22 Jan 2013, final revision 23 Oct 2013, accepted 13 Dec 2013

Funding

The authors acknowledge the financial support of NHS Research Scotland (NRS), through the Chief Scientist Office (CZH/4/295), and of the Scottish Mental Health Research Network. M.B. was partly supported by the NIHR Birmingham and Black Country Collaboration for Leadership in Applied Healthcare Research (CLAHRC).

Acknowledgements

The authors would also like to acknowledge the support of staff and service users in completing this project. The authors are grateful to four anonymous reviewers who provided detailed and constructive reviews throughout.

References

1 Varese F, Smeets F, Drukker M, Lieverse R, Lataster T, Viechtbauer W, et al. Childhood adversities increase the risk of psychosis: a meta-analysis of patient-control, prospective- and cross-sectional cohort studies. *Schizophr Bull* 2012; **38**: 661–71.

2 Lataster J, Myin-Germeys I, Lieb R, Wittchen H-U, van Os J. Adversity and psychosis: a 10-year prospective study investigating synergism between

https://doi.org/10.1192/bjp.bp.113.126722 Published online by Cambridge University Press

early and recent adversity psychosis. *Acta Psychiatr Scand* 2012; **125**: 388–99.

3 Lardinois M, Lataster T, Mengelers R, van Os J, Myin-Germeys I. Childhood trauma and increased stress sensitivity in psychosis. *Acta Psychiatr Scand* 2011; **123**: 28–35.

4 Bowlby J. *Attachment and Loss: Vol. 3. Loss, Sadness and Depression*. Pimlico, 1980.

5 Fraley RC. Attachment stability from infancy to adulthood: meta-analysis and dynamic modeling of developmental mechanisms. *Pers Soc Psychol Rev* 2002; **6**: 123–51.

6 Rutten BPF, Hammels C, Geschwind N, Menne-Lothmann C, Pishva E, Schruers K, et al. Resilience in mental health: linking psychological and neurobiological perspectives. *Aca Psychiatr Scand* 2013; **128**: 3–20.

7 Gumley A, Taylor H, Schwannauer M, Macbeth A. A systematic review of attachment and psychosis: measurement, construct validity and outcomes. *Acta Psychiatr Scand* 2014; **129**: 257–74.

8 American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders (4th edn) (DSM-IV).* APA, 1994.

9 Kay SR, Fiszbein A, Opler LA. The Positive and Negative Syndrome Scale (PANSS) for schizophrenia. *Schizophr Bull* 1987; **13**: 261–76.

10 Ceskova E, Prikryl R, Kasparek T, Kucerova H. Insight in first episode schizophrenia. *Int J Psychiatry Clin Pract* 2008; **12**: 36–40.

11 Beiser M, Erickson D, Fleming JAE, Iacono WG. Establishing the onset of psychotic illness. *Am J Psychiatry* 1993; **150**: 1349–54.

12 Skeate A, Jackson C, Birchwood M, Jones C. Duration of untreated psychosis and pathways to care in first episode psychosis. Investigation of help-seeking behaviour in primary care. *Br J Psychiatry* 2002; **181** (suppl 43): s73–7.

13 Hesse E. The Adult Attachment Interview: protocol, method of analysis and empirical studies. In *Handbook of Attachment: Theory, Research, and Clinical Applications* (2nd edn) (eds J Cassidy, PR Shaver): 552–98. Guilford Press, 2008.

14 Macbeth A, Gumley A, Schwannauer M, Fisher R. Attachment states of mind, mentalization and their correlates in a first episode psychosis sample. *Psychol Psychother* 2011; **84**, 42–57.

15 Hesse E. Discourse, memory and the Adult Attachment Interview: a note with emphasis on the emerging 'cannot classify' category. *Infant Men Health J* 1996; **17**: 4–11.

16 Sagi A, Bakermans-Kranenburg MJ, Scharf MH, Koren-Karie N, Joels T, Mayseless O. Stability and discriminant validity of the Adult Attachment Interview: a psychometric study in young Israeli adults. *Dev Psychol* 1994; **30**: 771–7.

17 Borenstein M, Rothstein H, Cohenet J. *Sample Power (version 2.0).* SPSS Inc, 2000.

18 Faul F, Erdfelder E, Buchner A, Lang AG. Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. *Behav Res Methods* 2009; **41**: 1149–60.

19 Marshall M, Lewis S, Lockwood A, Drake R, Jones P, Croudace T. Association between duration of untreated psychosis and outcome in cohorts of first episode patients. *Arch Gen Psychiatry* 2005; **62**: 975–83.

20 Bentler PM. *EQS 6 Structural Equations Program Manual*. Multivariate Software, 2010.

21 MacKinnon DP, Fairchild AJ, Fritz MS. Mediation analysis. *Annu Rev Psychol* 2007; **58**: 593–614.

22 Hayes AF. Beyond Baron and Kenny: statistical mediation analysis in the new millennium. *Commun Monogr* 2009; **76**: 408–20.

23 Iacobucci D. Structural equations modeling: fit indices, sample size, and advanced topics. *J Consum Psychol* 2010; **20**: 90–8.

24 Hu L, Bentler PM. Fit indices in covariance structural equation modeling: sensitivity to underparameterized model misspecification. *Psychol Methods* 1998; **3**: 424–53.

25 Browne MW, Cudeck R. Alternative ways of assessing model fit. In *Testing Structural Equation Models* (eds KA Bollen, LS Long): 136–62. Sage, 1993.

26 Dozier MK, Stovall-McClough C, Albus KE. Attachment and psychopathology in adulthood. In *Handbook of Attachment: Theory, Research, and Clinical Applications* (2nd edn) (eds J Cassidy, PR Shaver): 718–44. Guilford Press, 2008.

27 Fraley CR. Attachment stability from infancy to adulthood: meta-analysis and dynamic modeling of developmental mechanisms. *Pers Soc Psychol Rev* 2002; **6**: 123–51.

28 Strathearn L. Maternal neglect: oxytocin, dopamine and the neurobiology of attachment. *J Neuroendocrinol* 2011; **23**: 1054–65.

29 Rosenfeld AJ, Lieberman JA, Jarskog LF. Oxytocin, dopamine, and the amygdala: a neurofunctional model of social cognitive deficits in schizophrenia. *Schizophr Bull* 2011; **37**: 1077–87.

30 Aleman A, Hijman R, de Haan EHF, Kahn RS. Memory impairment in Schizophrenia: a meta-analysis. *Am J Psychiatry* 1999; **156**: 1358–66.

31 Shannon C, Douse K, McCusker C, Feeney L, Barrett S, Mulholland C. The association between childhood trauma and memory functioning in schizophrenia. *Schizophr Bull* 2011; **37**: 531–7.

32 Berry K, Barrowclough C, Wearden A. Attachment theory: a framework for understanding symptoms of interpersonal relationshipsin psychosis. *Behav Res Ther* 2008; **46**: 1275–82.

33 Macbeth A, Gumley A. Premorbid adjustment, symptom development and quality of life in first episode psychosis: a systematic review of the literature. *Acta Psychiatr Scandin* 2008; **17**: 85–99.

34 Owens KA, Haddock G, Berry K. The role of therapeutic alliance in the regulation of emotion in psychosis. An attachment perspective. *Clin Psychol Psychother* 2013; **20**: 523–30.

35 Lysaker PH, Dimaggio G, Carcione A, Procacci M, Buck KD, Davis LW, et al. Metacognition and schizophrenia: the capacity for self-reflectivity as a predictor for prospective assessments of work performance over six months. *Schizophr Res* 2010; **122**: 124–30.

36 Lysaker PH, Gumley A, Brune M, Vanheule S, Buck K, Dimaggio G. Deficits in the ability to recognize one's own affects and those of others: associations with neurocognition, symptoms and sexual trauma among persons with schizophrenia spectrum disorders. *Conscious Cogn* 2011; **20**: 1183–92.

37 Brune M. ''Theory of Mind'' in schizophrenia: a review of the literature. *Schizophr Bull* 2005; **31**: 21–42.

38 Tait L, Birchwood M, Trower P. Adapting to the challenge of psychosis: personal resilience and the use of sealing-over (avoidant) coping strategies. *Br J Psychiatry* 2004; **185**: 410–5.

https://doi.org/10.1192/bjp.bp.113.126722 Published online by Cambridge University Press