

**Attachment style predicts 6-month improvement in psychoticism in persons at-risk mental states for psychosis.**

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**Abstract:**

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**Aim:** Insecure attachment may influence vulnerability to and outcome of psychotic symptomatology. The present study examined whether attachment style predicted symptoms and functioning of at-risk mental state (ARMS) patients after 6 months of psychosocial intervention, over and above the effects of initial clinical severity and premorbid social adjustment (PSA).

**Methods:** Symptoms and functioning were assessed at baseline and 6 months later in 31 ARMS patients (mean age = 15.7). No patient received antipsychotic medication, but all engaged in intense psychosocial needs-adapted treatment. Clinicians (unaware of the aims of the study) rated attachment, PSA, symptoms, and functioning.

**Results:** Attachment was not related to baseline clinical severity. However, improvement in psychoticism was predicted by attachment (in particular by secure, preoccupied and dismissing) beyond the effects of baseline clinical severity and PSA. Secure attachment also predicted improvements in disorganization and functioning. Poor PSA predicted less improvement in disorganization and negative symptoms but did not impact psychoticism.

**Conclusions:** The three attachment prototypes that predicted improvement in psychoticism (secure, preoccupied and dismissing) share the existence of at least one positive psychological model (either about self or about others). It may be that the psychosocial intervention helped ARMS patients to disconfirm negative models and/or reinforce positive ones. Patients' attachment styles were not related to baseline clinical severity but impacted improvement of positive symptoms. These findings appear consistent with evidence that impaired self-esteem and dysfunctional self and others schemas constitute risk factors for reality distortion.

**Keywords:** at-risk mental state | attachment | early psychosis | premorbid social adjustment | psychosocial treatment | psychology | early intervention

**Article:**

## INTRODUCTION

Bowlby's attachment theory postulates that the quality of early experiences with caregivers contributes to internal working models that provide the prototypes for subsequent social relationships.<sup>1,2</sup> Following a line of investigation that examines attachment from the perspective of adulthood, Bartholomew and Horowitz<sup>3</sup> proposed two types of internal working models: first, the model of the self is associated with the degree of anxiety and dependency experienced in close relationships. Second, the model of others is associated with the tendency to search for or avoid closeness in relationships. These internal working models can be divided into either positive or negative expressions, resulting in four attachment prototypes: secure (positive model of the self and others), preoccupied (negative model of the self and positive model of others), dismissing avoidant (positive model of the self and negative model of others) and fearful avoidant (negative model of the self and others).

Studies found that the majority of patients with schizophrenia were classified as having either dismissing or fearful attachment prototypes.<sup>4,5</sup> Mickelson and colleagues<sup>6</sup> found a high proportion of schizophrenia patients with avoidant attachment. Insecure attachment has been linked to the onset of schizophrenia at an earlier age.<sup>7</sup> A greater prevalence of the ambivalent prototype (similar to the preoccupied prototype) of peer attachment has been found in first-episode psychosis samples.<sup>8</sup> Avoidance attachment has been associated with positive and negative symptoms,<sup>7</sup> as well as paranoia, in schizophrenia patients.<sup>9</sup>

The role of environmental factors in the development and course of psychosis has been increasingly demonstrated.<sup>10</sup> Specifically, negative beliefs about the self and one's social environment play an important role in vulnerability for and the maintenance of psychotic symptoms in current psychosocial models of psychosis.<sup>11</sup> Associations between avoidant attachment and positive symptoms support cognitive models of psychosis that suggest that negative beliefs and social withdrawal play a role in maintaining positive symptoms,<sup>12</sup> particularly paranoia.<sup>13</sup> Some investigations have demonstrated a link between psychotic symptoms and negative beliefs about the self and others.<sup>14</sup> Avoidant strategies have been linked to both a poor recovery following the onset of psychotic symptoms,<sup>15</sup> and insecure attachment and negative self-evaluation in psychotic patients.<sup>16</sup> The quality of interpersonal relationships and interpersonal functioning has been associated with relapse and recovery after the onset of symptoms.<sup>17</sup> All these findings seem to indicate that insecure attachment in adulthood, which is

associated with negative beliefs about the self and others as well as with maladaptive methods for coping with stress, can increase the vulnerability to psychotic symptoms and have an adverse effect on the course of psychosis once symptoms are present.<sup>18</sup>

The majority of studies on attachment in psychotic disorders were conducted with chronic patients, so the role of attachment in the initial stages of psychosis remains poorly understood. The early detection and treatment of prodromal patients or 'at-risk mental states' (ARMS) for psychosis is considered as a way to improve the course of the disorder,<sup>19</sup> because delay in treatment correlates with unfavourable outcome.<sup>20</sup> In ARMS patients psychosocial interventions appear to offer advantages relative to antipsychotic medications.<sup>21</sup> However, an intensive psychosocial treatment needs the engagement and a reasonable working alliance,<sup>22</sup> two aspects easier to develop in the pre-psychotic phase<sup>23</sup> and both related to attachment prototypes.<sup>16,24</sup> So, it seems essential to know the role of patients' attachment prototypes at this early stage and its impact on treatment outcomes.

Several studies link childhood attachment prototypes to children's social and emotional adjustment throughout childhood.<sup>25</sup> In this sense, premorbid social adjustment (PSA) in psychosis and attachment prototypes are related and might share some behavioural aspects. Poor PSA is predictive of transition to the first episode of psychosis<sup>26</sup> and is associated with poorer clinical outcome in psychosis.<sup>27</sup> Therefore, it is important to explore whether attachment prototypes contribute to the prediction of outcome in the early phases of psychosis beyond the well-established role of PSA. To the best of our knowledge, there are no studies that have addressed this issue.

Using a prospective design, the aim of the current study was to explore whether attachment prototypes (defined at baseline, pretreatment) predict symptomatic and functional status of ARMS patients after 6 months of psychosocial intervention. Also, the role of attachment over and above the effect of PSA and clinical severity is analysed. It is expected that PSA will be associated with symptoms and functioning at 6 months and that attachment will predict improvement over and above the effect of PSA. In particular, the secure attachment prototype is hypothesized to be predictive of symptomatic and functional improvement, whereas insecure prototypes will be predictive of poorer recovery.

## METHODS

## Participants

Participants were recruited from a public service from Barcelona, Spain specializing in the early detection and treatment of psychosis, the Early Care Team for At-Risk of Psychosis Patients (EAPP) team.<sup>28</sup> Criteria for the ARMS groups were derived from the European Prediction of Psychosis Study proposal<sup>29</sup>: age range between 12 and 35 years, presence of attenuated positive symptoms, brief limited intermittent psychotic symptoms or familial vulnerability plus reduced functioning (operationalization of criteria in Table 1). Exclusion criteria were diagnosis of a previous psychotic episode lasting for more than 1 week, psychotic symptoms due to substance abuse or to organic mental disorder, mental retardation and taking antipsychotic medication during the study period.

Table 1. Inclusion criteria for At-risk mental state participants

Presence of any of the following conditions

A – Attenuated Positive Symptoms: Presence of at least one of the following symptoms assessed by the Scale of Prodromal Symptoms with a score between 3 and 5 and an appearance of several times per week for a period of at least 1 week: unusual thought content/delusional ideas, suspiciousness/persecutory ideas, grandiosity, perceptual abnormalities/hallucinations, disorganized communication, odd behaviour or appearance.

B – Brief Limited Intermittent Psychotic Symptoms: Presence of at least one of the following symptoms evaluated with the Positive and Negative Symptoms Scale, score equal or more than 4, that resolve spontaneously in 7 days and an interval between episodes with these symptoms of at least 1 week: delusions, conceptual disorganization, grandiosity, hallucinations, suspiciousness.

C – Familial risk plus reduced functioning: A change in mental state or functioning leading to a reduction of 30% or more on the GAF for at least 1 month within the last year compared with the highest level of previous functioning, plus at least one of the following risk indicators: 1 – one first- or second-degree relative with a history of any DSM-IV psychotic disorder (not due to a medical factor or substance induced), 2 – a schizotypal personality disorder of the index person according to DSM-IV.

DSM-IV, Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition; GAF, Global Assessment of Functioning.

Informed consent was signed by the participants and/or their parents. The procedure was approved by the Jordi Gol Ethics Committee, an organism that supports research in primary health care in Catalonia. All patients who fulfilled ARMS criteria received a needs-based treatment<sup>30,31</sup> during at least the 6-month follow-up.

Forty-eight patients met the ARMS criteria during the 30 months recruitment period. Three refused to participate, 11 did not complete the follow-up and 3 received antipsychotic medication during the follow-up period. No differences were found for symptoms and functioning at baseline between those who completed the study and those who did not. The final sample was composed of 31 patients with a mean age of 15.7 (SD = 3.1) years (range 12–25). The participants were all single, 74% were men and 84% were in secondary school. Socioeconomic level ranged from very-low (13%), low (52%), middle-low (26%) to middle-middle (10%) level. During follow-up, 26 patients did not receive medications; two took antidepressant and three took anxiolytic medications.

## Measures

Symptoms were assessed with the Positive and Negative Symptoms Scale (PANSS),<sup>32,33</sup> using the subset of PANSS items proposed to tap symptom outcome by Andreasen and colleagues.<sup>34</sup> This includes psychoticism (delusions, hallucinatory behaviour and unusual thought content), disorganization (conceptual disorganization and mannerisms) and negative symptoms (blunted affect, social withdrawal and lack of spontaneity).

General functioning was evaluated with the Global Assessment of Functioning (GAF),<sup>35</sup> and PSA was assessed with the Mental Health Items List,<sup>36</sup> a checklist of 87 items assessing risk factors for severe mental disorder throughout childhood and adolescence. For this study, the 15 items tapping social functioning up to age 11 were selected. High PSA scores indicate poor adjustment. Internal consistency of the PSA was 0.79. The assessment of PSA at baseline was done using a multisource approach. Firstly, scoring was based on the information obtained in the comprehensive clinical record. Then, the clinician in charge was interviewed by a trained psychologist to collect missing data, and when information was still unavailable, the psychologist conducted an interview with relatives.

Attachment was assessed with the Relationships Questionnaire (RQ).<sup>3,37</sup> The RQ is a single-item measure made up of four short paragraphs, each describing a prototypical attachment pattern: Secure, Fearful, Preoccupied and Dismissing. It has been widely used in adult attachment research, including clinical samples of adolescents, and has been established to have good reliability and validity.<sup>38,39</sup> Its stability is moderate but better when the scale is completed by an observer than by self-report and when using continuous rather than categorical ratings,<sup>40</sup> which is the case of this study. The primary clinician rated each participant on degree of

correspondence to each prototype on a seven-point scale and chose which prototype best characterized participants.

Raters of all measures were unaware of the aim of the research.

## RESULTS

Most patients had a predominant fearful attachment prototype (71%), followed by preoccupied (16.1%), dismissing (6.4%) and secure (6.5%) prototypes. The average PSA was 7.84 (SD = 4.05; range = 0–14).

Regarding change in symptoms and functioning from baseline to 6-month follow-up, 83.9% of participants either improved or remained the same on the psychoticism dimension; the same applied to 83.9% on the disorganization dimension, 71% on the negative symptoms dimension and 77.4% on the GAF. Paired-samples t-tests comparing each symptom dimension and functioning at baseline and follow-up indicated that the change was only significant for functional level,  $t(30) = -2.40$ ,  $P = 0.02$ , indicating better functioning at 6 months. Table 2 shows descriptive data for symptoms and functioning at baseline and follow-up.

**Table 2. Descriptive data for symptoms and functioning at baseline and 6-month follow-up**

	Baseline		Follow-up	
	Mean (SD)	Range	Mean (SD)	Range
1. GAF, Global Assessment of Functioning; PANSS, Positive and Negative Symptoms Scale.				
PANSS dimensions				
Psychoticism	4.89 (2.58)	3–13	4.74 (2.06)	3–11
Disorganization	3.97 (2.01)	2–10	3.77 (1.56)	2–7

	Baseline		Follow-up	
	Mean (SD)	Range	Mean (SD)	Range
Negative symptoms	7.87 (2.93)	3–15	8.06 (2.82)	3–14
GAF	46.5 (10.7)	25–61	51.5 (8.3)	40–65

Table 3 presents the correlations of the attachment prototypes and PSA with the baseline measures of symptoms and functioning. None of these correlations were significant, indicating that attachment was unassociated with participants' baseline levels of symptoms and functioning.

**Table 3. Pearson correlations of attachment and premorbid social adjustment with baseline measures of symptoms and functioning**

Secure attachment	Preoccupied attachment	Fearful attachment	Dismissing attachment	Premorbid social adjustment <sup>‡</sup>	
Psychoticism baseline	-0.03	<b>-0.30</b> <sup>†</sup>	0.01	-0.01	-0.13
Disorganization baseline	-0.05	0.13	<b>-0.31</b>	0.13	-0.06
Negative symptoms baseline	-0.09	-0.17	-0.24	0.00	-0.03
GAF baseline	0.15	0.26	-0.22	-0.01	-0.18

<sup>†</sup> Medium effect sizes indicated in bold font.

<sup>‡</sup> High premorbid social adjustment scores reflect worse adjustment.

GAF, Global Assessment of Functioning.

Table 4 shows the results of the regression analyses conducted to evaluate the independent contribution of attachment in predicting change in symptom/functioning scores over and above the predictive value of baseline symptom/functioning levels and PSA. Baseline scores (symptoms or functioning) were entered at the first step, PSA was entered at the second step, and the four attachment variables were entered as a block at the third step in order to examine their independent contribution over and above the previous main effects. This provides a conservative test of the effect of attachment prototypes because their impact is examined after variance from all of the other predictors has been partialled out. Please note that for regression analyses effect sizes, expressed as f-squared values, a small effect is denoted by an f-square around 0.02, medium at 0.15 and large at 0.35. As seen in the earlier correlational analyses, symptoms/functioning baseline levels significantly predicted respective change scores at the first step. At the second step, PSA only predicted improvement in disorganization and negative symptoms over and above the effect of baseline status. Secure, preoccupied and dismissing attachment independently accounted for significant variance in the change in psychoticism symptoms across the 6-month period at step 3. For disorganization, secure attachment contributed significantly to explain improvement at follow-up. For negative symptoms, none of the attachment prototypes predicted change scores at 6 months. As for functioning, secure attachment made a significant contribution over and above the effect of baseline symptom levels and PSA. Note that among the attachment prototypes, the effect sizes were largest for secure attachment. Despite the fact that secure attachment was unrelated to baseline measures of symptoms and functioning, it significantly predicted improvement in participants across the 6-month period.



**Table 4. Impact of attachment prototypes on change in symptoms and functioning after partialing baseline symptoms and premorbid social adjustment**

Step 1			Step 2			Step 3						TotalR <sup>2</sup>				
Baseline symptoms			PSA ‡			Attachment prototypes										
β	ΔR <sup>2</sup>	f <sup>2</sup> †	β	ΔR <sup>2</sup>	f <sup>2</sup>	Secure		Preoccupied		Fearful			Dismissing			
β	ΔR <sup>2</sup>	f <sup>2</sup> †	β	ΔR <sup>2</sup>	f <sup>2</sup>	β	f <sup>2</sup>	β	f <sup>2</sup>	β	f <sup>2</sup>	β	f <sup>2</sup>	ΔR <sup>2</sup>		
<b>Criteria</b>																
Change in																
Psychoticism	0.63***	0.390	<b>0.64</b>	-0.24	0.058	0.11	0.48**	<b>0.44</b>	0.30*	<b>0.21</b>	0.12	0.04	0.28*	<b>0.20</b>	0.204*	0.652***
Disorganization	0.65***	0.398	<b>0.66</b>	-0.33*	0.105	<b>0.21</b>	0.33*	<b>0.20</b>	0.24	0.14	0.18	0.07	-0.03	0.01	0.124	0.627***
Negative symptoms	0.51**	0.260	<b>0.35</b>	-0.36*	0.130	<b>0.21</b>	0.23	0.07	0.13	0.03	0.14	0.03	-0.17	0.05	0.092	0.481**
Functioning	-0.72***	0.521	<b>1.09</b>	-0.14	0.020	0.04	0.47**	<b>0.55</b>	0.10	0.03	0.03	0.00	-0.09	0.03	0.193**	0.734***

\* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ .

† Medium effect sizes ( $f^2$ ) indicated in **bold font**, large effect sizes in **bold and italicized font**. Note that betas and effect sizes indicate the effect when all variables at the current and previous steps are entered into the model.

‡ High scores reflect worse adjustment.

PSA, premorbid social adjustment.

## DISCUSSION

The main finding of this study is that attachment prototypes, particularly secure, preoccupied and dismissing attachment, predicted improvement in psychoticism beyond the effects of baseline symptom severity and PSA. There was no significant change in any clinical dimension at 6 months at group level, but significant associations between predictors and clinical and functional outcome did emerge. At first sight, the finding that preoccupied and dismissing prototypes also predicted amelioration of psychoticism might seem contradictory. However, a deeper examination reveals that these prototypes share with the secure one the existence of at least one positive working model (either of the self or others), suggesting that in order to benefit from treatment, at least in a relatively early stage, it is necessary to have some degree of a positive internal working model.

The protective therapeutic setting probably helps patients to strengthen the positive elements of the working models and thus the development of trust and engagement with the therapist. This might decrease the negative model of others and make the therapeutic interventions a valid source of personal confirmation, reinforcing equally a less negative model of the self. In this sense, a more negative model of the self (strongly related with self-esteem) has been linked to increases in hallucinatory behaviour,<sup>9</sup> paranoia,<sup>14</sup> risk of psychosis<sup>41</sup> and maintaining the symptomatology.<sup>42</sup> Consequently, feeling valued in psychotherapy can contribute to symptom reduction, especially paranoia and hallucinatory behaviour.

The secure emotional setting that therapy offers might also explain why secure attachment was predictive of improvement in disorganization and functioning. In therapeutic contexts, reinforcement of positive aspects of attachment could help to contain anxiety, facilitating more coherent and organized verbal and behavioural expression and recovering contact with others in daily activities.

The possible therapeutic changes proposed earlier required that therapy represents a significant emotional experience<sup>43</sup> in which the therapist becomes a healthy attachment figure.<sup>44</sup> This therapeutic approach has been demonstrated to be effective at least in promoting emotional recovery and relapse prevention following a psychotic episode.<sup>45,46</sup>

None of the attachment prototypes predicted improvement in negative symptoms. Negative symptoms might have a stronger genetic and neurodevelopmental basis compared with the stress-sensitivity and cognitive pathways leading to positive symptoms.<sup>47</sup> Indeed, negative

symptoms show a greater relationship with neurocognitive deficits,<sup>48</sup> exposure to putative neurodevelopmental markers and poor PSA<sup>49</sup> than positive symptoms. In addition, no treatment appears to substantially work when negative symptoms are narrowly defined,<sup>50</sup> which is the case of this study.

Poor PSA was predictive of less improvement in negative symptoms and disorganization. It is well known that poor PSA is a powerful predictor of poorer treatment outcome,<sup>27</sup> especially for severity and persistence of negative symptoms in first episode psychosis (FEP) samples.<sup>51</sup> The specific relationship between disorganization and PSA has been less explored; however, it has been proposed that the outcome of negative symptoms and disorganization are more likely to be influenced by longer-term characteristics such as premorbid adjustment and therefore may not be as responsive to effects of early intervention.<sup>52</sup> From the attachment framework, these results can be associated with the establishment, early in life, of predominantly negative internal working models of the self and others, which can lead to interpersonal problems such as social inhibition that remain throughout development and might favour the emergence of psychotic symptomatology in conjunction with other risk factors.

The slight symptomatic change after 6 months detected in this study might have been influenced by using the PANSS as a follow-up instrument, as it might be inappropriate for measuring symptomatic change in prodromal samples.<sup>53</sup> On the other hand, the predominance of low socioeconomic status in our sample, related to living in a densely urbanized sector, might be impacting on living conditions, generating a flow of constant stressful situations that limit the impact of the therapeutic intervention. Of note, these factors have been associated with a high presence of psychotic symptoms and a greater risk of psychosis in epidemiological studies and vulnerable samples to psychosis.<sup>54–58</sup> However, the maintenance of symptomatology in prodromal samples, not its deterioration, is in itself relevant at a clinical level, especially when dealing with ‘nuclear’ symptoms of schizophrenia that have not been treated with antipsychotic medication. According to various investigations, between 35% and 54% of ARMS cases detected using criteria similar to this study make the transition to FEP in 1 year,<sup>19,59</sup> even if these percentages have recently declined (e.g. Woods et al.<sup>60</sup>). Therefore, the slight symptomatic change might indicate that a brief psychosocial treatment acts as a brake on the exacerbation of symptoms, thereby maintaining symptomatology at entry level.

This exploratory study contributes to the understanding of psychotic symptomatology within the framework of attachment theory, thereby continuing efforts already begun.<sup>18,61</sup> However, to the best of our knowledge, this is the first study on the potential impact of attachment on psychosocial interventions in ARMS patients, with encouraging results regarding the reduction

and stagnation of subclinical levels of psychotic symptoms in help-seeking ARMS patients. It suggests that knowing the patient's attachment prototype can help in planning and tailoring therapeutic objectives and intervention strategies.

The conclusions of this study must be considered taking into account their limitations. The RQ has been mainly applied in relation to specific others and less as a measure of general attachment (which was our approach), although it is one of the most extensively used measures with large validation studies. Also, in the evaluation of attachment prototypes the assessment of the therapist was considered. This was done to avoid a potential bias in patients' self-report due to the current clinical state. Future studies should investigate the convenience of using patients' self-report or a combined approach, as well as taking into account the attachment prototypes of the intervening professionals, because these affect the relationship with patients with psychosis.<sup>62,63</sup> Finally, in order to prove the assumption that symptomatic improvement reflected change in internal working models, this ongoing project is monitoring changes in attachment with repeated measures over time.

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