Impact of attachment style on the 1-year outcome of persons with an at-risk mental state for psychosis

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Abstract:

Attachment theory provides key elements for understanding the psychosocial vulnerability for and response to the emergence of psychosis. This study examined (1) whether pre-treatment attachment styles are differentially associated with clinical and functional outcome in at-risk mental state (ARMS) for psychosis patients across one year of psychosocial treatment, and (2) whether clinical change is associated with changes in attachment ratings beyond the effect of baseline symptom severity. Thirty-eight ARMS patients (mean age=16.7, S.D.=5.9) identified from a psychosocial needs-adapted treatment were evaluated with the Positive and Negative Syndrome Scale, the Global Assessment of Functioning, and the Relationships Questionnaire. Lower levels of insecure–avoidant attachment predicted better clinical outcomes, whereas higher levels of secure attachment predicted improvement in functioning. A decrease in preoccupied–anxious attachment was associated with symptom amelioration. The findings suggest that the intensity of insecure attachment plays a significant role in the clinical outcome of ARMS patients involved in psychosocial treatment. Reducing the levels of insecure attachment in the therapeutic setting probably favors a better course in the early phases of psychosis. Furthermore, the finding that negative models of the self and others were associated with symptom outcome is consistent with current psychosocial models of psychosis.

Article:

Introduction

Attachment theory provides research and theoretical models with key elements for understanding difficulties in interpersonal relationships across the lifespan. The human attachment system

organizes early interpersonal experiences within cognitive-affective representations, or "internal working models," of the self (i.e., one′s own worthiness/lovability) and others (i.e., others′ responsiveness/availability) that influence appraisals of, and behavior in, subsequent relationships (Bowlby, 1973, Bartholomew and Horowitz, 1991 and Mikulincer and Shaver, 2007). These models are considered to be a critical source of continuity in the functioning of the attachment system across life (Mikulincer and Shaver, 2003). Bartholomew and Horowitz (1991) proposed a framework of adult attachment in which the self and other models (also considered to tap attachment anxiety and avoidance, respectively) intersect in a two-dimensional space to yield four attachment prototypes: fearful–avoidant, characterized by negative views of self and other; dismissing–avoidant, typified by a positive view of self and negative view of other; preoccupied, typified by a negative view of self and positive view of others; secure, characterized by positive views of self and other. 1

Despite the essential continuity of the attachment system, internal working models can be modified as a result of interpersonally and emotionally relevant life circumstances (Bowlby, 1969 and Davila and Cobb, 2004). In this regard, psychotherapy offers a significant emotional experience that is capable of changing problematic working models (Bowlby, 1988). For example, some studies investigating changes in attachment style over the course of therapy have reported that increases in attachment security or decreases in attachment insecurity are associated with a better outcome (see Mikulincer et al., 2013).

Current models of psychosis suggest that adverse environmental factors, especially interpersonal traumas, play an important role in the development and course of psychosis (e.g., van Winkel et al., 2013 and Bentall et al., 2014). Indeed, research has shown a high prevalence of trauma in high-risk for psychosis samples and that sexual trauma in particular is predictive of transition to psychosis (Thompson et al., 2014). Cognitive biases such as negative beliefs about the self and one′s social environment have been postulated to play a fundamental role in the vulnerability for and maintenance of psychotic symptoms (Garety et al., 2001 and Penn et al., 2004). In this regard, negative self- and other-schemas have been associated with attenuated psychotic symptoms in individuals at-risk for psychosis (Addington and Tran, 2009). Likewise, avoidant recovery strategies (i.e., sealing over) have been linked to both poor recovery following the onset of psychotic symptoms (Thompson et al., 2003) and to insecure attachment and negative self-evaluation in patients with psychosis (Tait et al., 2004). Other factors like the individual′s interpersonal context and interpersonal functioning have also been associated with relapse and recovery after the onset of symptoms (Gumley, 2011).

Attachment theory has the potential of drawing together the different sets of findings mentioned above. It provides a lifespan approach that is useful for understanding key processes that contribute to the vulnerability for and response to the emergence of psychosis, including affective dysregulation, social cognition, and interpersonal behavior (Berry et al., 2007, Gumley et al., 2014 and Korver-Nieberg et al., 2014). Insecure or disorganized attachment patterns are activated during periods of stress or threat perception, yielding the activation of nonadaptive affective, attentional, and behavioral modes linked to negative internal working models. These patterns could mediate the use of dysfunctional cognitive mechanisms and affective dysregulation, which, probably in interaction, might lead to reality distortion (Read et al., 2009). Also, the characteristics associated with the chronic deactivation of the attachment system, such

as interpersonal disengagement and minimization of emotional expression (Mikulincer and Shaver, 2007), might contribute to the ontogeny of negative symptoms (Sheinbaum et al., 2013a).

Research has shown a high prevalence of insecure, and particularly avoidant or dismissing, attachment in psychosis samples (Dozier et al., 1991, Dozier and Lee, 1995 and Mickelson et al., 1997). As regards to the course of illness, insecure attachment has been linked to the onset of schizophrenia at an earlier age (Ponizovsky et al., 2007). Insecure attachment has also been associated with elevated depression and social anxiety in individuals at-risk for psychosis (Gajwani et al., 2013). At the symptom level, different forms of attachment insecurity have been associated with psychotic phenomena. In particular, avoidant attachment has been associated with positive and negative symptoms in persons with schizophrenia (Ponizovsky et al., 2007), as well as paranoia in both psychotic patients and individuals with early psychosis (Berry et al., 2008a and Korver-Nieberg et al., 2013). In addition, the preoccupied and fearful attachment styles have been associated with higher levels of positive symptoms in patients with schizophrenia (Ponizovsky et al., 2013) and with positive schizotypy in nonclinical samples (Sheinbaum et al., 2013a).

However, the role of attachment in at-risk for psychosis populations is not yet well understood. The early detection and treatment of prodromal or "at-risk mental states" (ARMS) patients for psychosis has been considered essential for the improvement of the disorder (Yung et al., 2004), since delay in treatment correlates with unfavorable outcome (Norman and Malla, 2001). In this stage, psychosocial interventions appear as the first-line treatment strategy, as assumed by different early intervention programs (Stafford et al., 2013 and Addington and van der Gaag, 2015). The continuity and development of this type of intervention needs the engagement of patients and a good working alliance with care providers (Lecomte et al., 2008), two aspects easier to develop in the at-risk phase (Bechdolf et al., 2006), and both associated with attachment style (Dozier et al., 2001 and Tait et al., 2004). Therefore, it is essential to understand the role of ARMS patient′s attachment style at this early stage and its impact on treatment outcomes.

In a previous study with ARMS patients (Quijada et al., 2012), we found that attachment style predicted symptom improvement after six months of psychosocial treatment. Specifically, a high level of secure attachment predicted improvement in psychoticism, disorganization and functioning, and higher levels of preoccupied and dismissing styles also predicted improvement in psychoticism. Both the preoccupied and dismissing styles share a positive working model, so it was hypothesized that the psychosocial intervention may have an impact on internal working models via strengthening the positive working models and disconfirming the negative ones. However, this proposal could not be tested in that study as attachment re-test was not available at six months. To our knowledge, only one study has explored change in attachment style and change in psychotic symptoms. This study showed that increases in attachment anxiety were associated with changes in total symptoms and hallucinations at follow-up in patients with psychosis (Berry et al., 2008a), suggesting that attachment style change may be associated with symptom course.

The present study expands upon earlier findings by examining (1) whether pre-treatment attachment is differentially associated with change in symptoms and functioning of ARMS

patients across one year of psychosocial treatment, and (2) whether clinical change is associated with change in attachment ratings beyond the effect of baseline symptom severity. Taking into account the scarcity of studies in this area (Gumley et al., 2014), hypotheses related to a specific insecure attachment prototypes were not offered. However, it was expected that patients with lower ratings of insecure and higher levels of secure attachment at the start of treatment would show greater decreases in symptoms and better improvement in functioning across the 12 months of treatment (over-and-above the baseline level of symptoms and impairment). Furthermore, it was expected that increases in levels of secure attachment and decreases in levels of insecure attachment across the 12 months of treatment would be associated with better outcome over-and-above the effect of baseline symptom/functioning severity.

Method

Participants

This was a naturalistic study in which participants were recruited using a convenience (consecutive type) sampling method from a public early psychosis service in Barcelona (Spain) that specialized in the early detection and treatment of psychosis (Quijada et al., 2010). The criteria used to establish ARMS groups followed the European Prediction of Psychosis Study proposal. The Scale of Prodromal Symptoms (SOPS; Miller et al., 1999 and Lemos et al., 2006) and the Positive and Negative Syndrome Scale (PANSS, Kay et al., 1987 and Peralta and Cuesta, 1994) were used for determining ARMS caseness (Klosterkötter et al., 2005; see Table 1 for details). Age range for inclusion was 12–45 years. Exclusion criteria were: (a) diagnosis of a previous psychotic episode for more than one week; (b) psychotic symptoms due to substance abuse or to an organic mental disorder; (c) mental retardation. Participants completed comprehensive medical and neurological evaluations (including computed tomography and electroencephalogram) to rule out organicity and a toxicological screening.

Presence of any of the following conditions:

A – Attenuated Positive Symptoms (APS): 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 one week: unusual thought content/delusional ideas, suspiciousness/persecutory ideas, grandiosity, perceptual abnormalities/hallucinations, disorganized communication, odd behavior or appearance.

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

C – Familial risk plus reduced functioning (RISK): A change in mental state or functioning leading to a reduction of 30% or more on the GAF for at least one month within the last year compared to 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.

Table 1. Inclusion criteria for At-risk mental state participants (Klosterkötter et al. 2005).

Sixty-eight patients met the ARMS criteria during the 41-month recruitment period. Four refused to participate and 26 did not complete the follow-up assessment due to withdrawing from treatment or relocation. No differences were found for symptoms, functioning or attachment levels at baseline between those who completed the study and those who did not. Patients were included in the final sample if they met the inclusion criteria and completed the follow-up period, resulting in a sample of 38 patients with a mean age of 16.7 (S.D.=5.9) years (range 12.0–38.6). Participants were all single, 76.3% were men, and 81.6% were in secondary school. Socioeconomic level ranged from very-low (15.8%), low (44.7%), middle-low (24.9%) to middle–middle (10.5%) level. Thirteen participants received medication during the course of the study period, including five taking antipsychotic medication. One patient transitioned to psychosis during the twelfth month and he was not excluded of the study. His predominant attachment was fearful. Note that neither a nonclinical comparison sample nor a nontreatment clinical comparison sample were included because the hypotheses of the study focused on examining the association of attachment with change in symptoms and functioning across 12 months of treatment.

Measures

Symptoms were assessed with the Positive and Negative Syndrome Scale. The PANSS is a clinician-administered, 30-item semi-structured interview consisting of 7 items assessing positive symptoms of psychosis, 7 items assessing negative symptoms, and 16 items assessing global psychopathology. All items are scored between 1 (not present) and 7 (severe). The PANSS has good reliability and validity (e.g., Kay et al., 1988) and has been used as an outcome measure in psychotherapy treatment with ARMS patients (Morrison et al., 2007). In this study, the PANSS was applied across the three time measurements and used as the symptom outcome measure (see the procedure section below).

General functioning was evaluated with the Global Assessment of Functioning (GAF, APA, 1994), a 100-point measure of psychological, social and occupational functioning.

Attachment was assessed with the Relationships Questionnaire (RQ; Bartholomew and Horowitz, 1991 and Schmitt et al., 2004). The RQ is comprised of four short paragraphs that describe prototypical attachment patterns: secure, fearful, preoccupied and dismissing. It has been widely used in adult attachment research including clinical samples of adolescents, and established to have good reliability and validity (Scharfe, 2002 and Ravitz et al., 2010). Participants are rated on each of the prototypes using a 7-point scale and are also categorically assigned to the prototype that best describes them. The stability of the RQ is moderate, but has been shown to be better when using continuous rather than categorical ratings (Scharfe and Bartholomew, 1994), which is the case of this study. The primary clinician of the patient rated the degree of correspondence to each prototype and chose which prototype best characterized participants.

Procedure

The procedure was carried out in accordance with the latest version of the Declaration of Helsinki and was approved by the Ethics Committee of primary health care in Catalonia. Informed consent was provided by the participants and/or their parents.

All participants in this study received a needs-based treatment (Alanen, 2003) during at least the 12-month-follow-up period. This treatment consisted of a range of services depending on the needs of each patient and family including family interviews, "12 h availability", individual psychotherapy, psychopharmacology, psycho-educational groups, multifamily therapy, social skills orientation, "parallel groups" for ARMS subjects and their families, preventive programs for offspring and families, visits in the environment and home, and regular meetings with community services.

Clinicians completed the clinical measures at baseline, 6 months and 12-month follow-up, and the attachment questionnaire at baseline and at 12 months. The clinicians were trained in the administration of the measures and were unaware of the goals and hypotheses of the research.

Data analysis

Data were analyzed using IBM SPSS 19.0 and HLM 6.0. Three types of analyses were conducted to test the hypotheses of the study. First of all, a comparison was conducted between baseline and 12-month follow-up scores on measures of attachment, symptoms, and functioning by means of paired samples t-tests. Effect sizes were calculated using Cohen′s d, following Cohen (1988).

Multilevel regression analyses were performed to analyze whether baseline attachment predicted change in symptoms and functioning across the baseline, 6 and 12 months assessments. Multilevel modeling provides a more appropriate method than unilevel regression for analyzing longitudinal data. The multilevel analyses examined whether attachment ratings moderated the slope of symptoms and functioning across the three assessments. All the multilevel regression analyses included as a first step the baseline score on the dependent measure of symptoms or functioning. This was done to make a more conservative test of whether variance in the attachment measures were predictive of the change in symptoms and functioning over-and-above the possible baseline association between attachment and symptoms, that is to determine that the predictive effect of attachment on outcome was not solely due to baseline associations of attachment and symptoms. The four attachment styles were then added simultaneously as predictors at the second step. No other predictors were entered into the model. A random intercept model was used for all analyses.

Finally, partial correlations were computed to examine whether the change in attachment across the 12 months was associated with change in symptoms and functioning across that time period, after partialling out variance associated with baseline symptoms or functioning. Note that change scores for all measures were calculated by subtracting the baseline scores from the 12 month scores. Therefore, positive scores in secure attachment and GAF reflect improvement, whereas positive scores for the PANSS and insecure attachments indicate worsening over time.

Note that we did not use familywise alpha adjustment given that it has been criticized to the extent that is overly conservative and reduces statistical power (e.g., O'Keefe, 2003). Furthermore, multiple comparisons do not present an issue in multilevel modeling (Gelman et al., 2012) and all of the analyses in the present study were planned.

Results

At baseline most patients had a predominant fearful attachment prototype (60.5%), followed by preoccupied (21.1%), dismissing (10.5%) and secure (7.9%). At the end of the follow up, 39.5% of patients changed their predominant attachment prototype. Of those who changed, 3 patients (7.9%) did so from an insecure to a secure attachment, and the rest (31.6%) changed from an insecure attachment prototype to another insecure prototype. Finally, fearful and preoccupied attachment were the most frequent predominant prototypes (both 39.5%), followed by secure (13.2%) and dismissing (7.9%). Regarding the stability of the attachment prototypes, attachment scores at baseline were positively and significantly correlated with attachment scores at 12 months, with the exception of the fearful prototype (secure attachment: $r=0.49$, $p=0.00$; fearful attachment: $r=0.22$, $p=0.18$; preoccupied attachment: $r=0.43$, $p=0.01$; dismissing attachment: $r=0.65$, $p=0.00$).

Table 2 presents descriptive data for attachment, symptoms and functioning at baseline and 12-month assessments, as well as the results of t-test comparisons. As can be seen, participants showed a pattern of overall improvement, reaching significant differences on secure attachment ratings, general psychopathology, total PANSS scores, and functioning. Table 2 also shows the effect sizes of all comparisons.

| | Baseline (n=38) | | | 12-Month (n=38) | | | |
	Mean (S.D.)	Range		Mean (S.D.)	Range	t-Test	Effect sizes (Cohen's d)
Attachment prototype							
Secure	2.61 (1.60)	1–6		3.18 (1.50)	1–6	2.27 (0.02)*	0.37
Fearful	4.84 (1.24)	2–6		4.61 (1.26)	2–7	−0.93 (0.35)	−0.18
Preoccupied	3.89 (1.46)	1–6		4.34 (1.71)	1–7	1.61 (0.11)	0.28
Dismissing	2.79 (1.40)	1–6		2.87 (1.41)	1–6	0.41 (0.68)	0.06
PANSS scale							
Positive	16.05 (6.02)	8–32		14.86 (4.72)	8–27	−1.28 (0.21)	−0.22
Negative	18.58 (6.48)	7–30		17.10 (5.78)	7–26	−1.47 (0.08)	−0.24
Psychopathology	39.58 (11.9)	22–66		36.05 (12.18)	21–74	−3.52 (0.03)*	−0.29
Total	74.21 (22.14)	46–119		68.03 (20.21)	41–122	−6.18 (0.03)*	−0.29
GAF	49.58 (10.71)	25–70		56.87 (8.20)	40–70	3.65 (0.001)*	0.76

* $p < 0.05$.

Table 2. Descriptive data for attachment, symptoms and functioning and mean comparisons between baseline and 12-month follow-Up.

Table 3 presents the results of the multilevel regression analyses performed to analyze the impact of baseline attachment on the slope of clinical and functional measures across the three assessments. As can be seen, fearful and dismissing attachment scores significantly predicted change in positive, negative and total scores. Dismissing attachment scores also predicted change in general psychopathology. For each of the significant analyses, participants with better baseline attachment experienced greater improvement across the 12 months of treatment than did participants with poorer attachment, over-and-above the effects of baseline symptoms. As illustrated in Fig. 1, participants lower in dismissing attachment experienced a greater decrease in positive symptoms across 12 months than did participants higher in dismissing attachment. Finally, secure attachment significantly predicted improvement in GAF scores across the 12-month treatment period over-and-above baseline GAF score. As seen in Fig. 2, participants who were higher in baseline secure attachment experienced greater improvement in functioning over the 12 months of treatment than did participants lower in secure attachment.

Predictor	Coefficient	Standard error
PANSS positive symptoms		
Secure	−0.003	0.040
Fearful	0.067*	0.029
Preoccupied	−0.003	0.041
Dismissing	0.078*	0.038
PANSS negative symptoms		
Secure	0.032	0.037
Fearful	0.073*	0.028
Preoccupied	−0.042	0.038
Dismissing	0.100*	0.050
PANSS general psychopathology		
Secure	0.161*	0.076
Fearful	0.130	0.074
Preoccupied	0.057	0.091
Dismissing	0.184*	0.075
PANSS total		
Secure	0.165	0.135
Fearful	0.275*	0.118
Preoccupied	−0.000	0.143
Dismissing	0.348*	0.137
GAF		
Secure	0.153**	0.045
Fearful	0.018	0.066
Preoccupied	0.054	0.069
Dismissing	−0.117	0.087

* $p<0.05$.

** $p<0.01$.

Table 3. Multilevel regression analyses on the association of baseline attachment with change in PANSS scales over 12 months partialling out PANSS baseline scores.
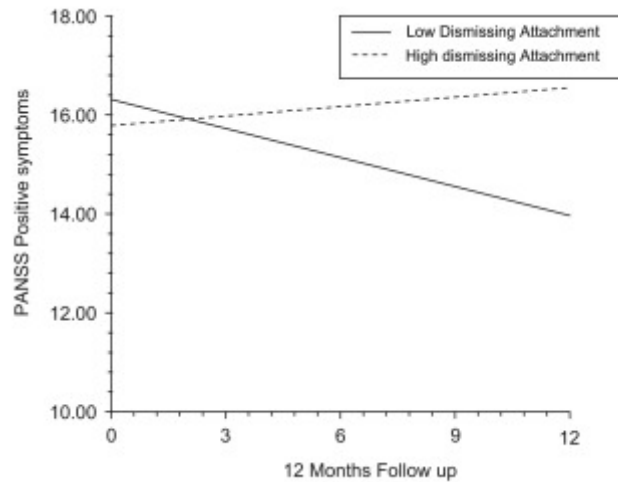
Fig. 1. Relationship of the course in PANSS positive symptoms with dismissive attachment across the 12 months assessments.
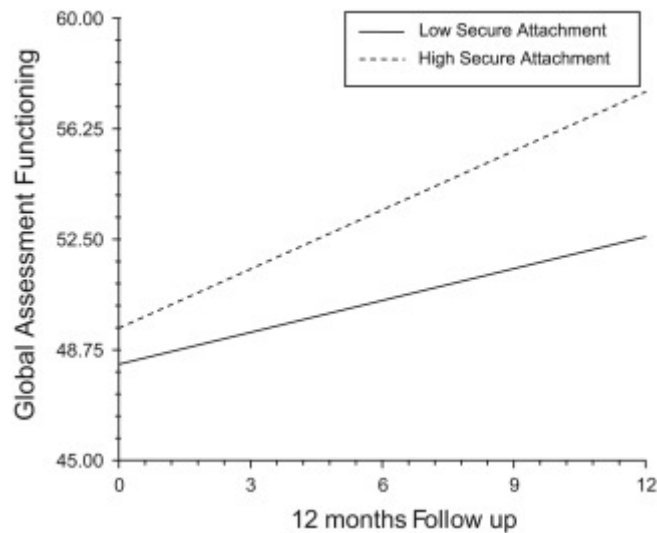

Fig. 2. Relationship of the course in GAF with secure attachment across the 12 months assessments.

Partial correlations were conducted between change in attachment prototypes and change in clinical measures controlling for the respective baseline scores (Table 4). Only change in preoccupied attachment was associated with clinical change. In particular, a decrease in preoccupied attachment ratings correlated with improvement in all PANSS scales: positive symptoms, negative symptoms, general psychopathology and total PANSS, but not with improvement in GAF. All these associations had a medium size effect.

	Change in			
	Secure	Fearful	Preoccupied	Dismissing
Change in PANSS Scale				
Positive	0.02	−0.09	**0.38**[*]	−0.11
Negative	−0.28	−0.23	**0.41**[*]	−0.18
Psychopathology	−0.01	−0.06	**0.38**[*]	−0.08
Total	−0.08	−0.13	**0.44**[**]	−0.15
GAF	−0.01	0.08	0.16	0.02

Medium effect sizes indicated in **bold font**.

* $p < 0.05$.

** $p < 0.01$.

Table 4. Correlations between change scores in attachment and clinical measures after the 12-month treatment controlling for the respective baseline symptoms/functioning scores.

Discussion

To the best of our knowledge, this is the first study to examine the association of attachment with changes in symptoms and functioning in ARMS patients across a 12-month period. As expected, patients with lower levels of insecure attachment at the beginning of treatment presented better clinical outcome after 12 months of psychosocial treatment beyond the effect of baseline symptom severity. Specifically, participants with lower levels of fearful–avoidant and dismissing–avoidant attachment at the start of treatment showed greater improvement in positive, negative, and total symptoms across one year of treatment. Some previous studies (for review, see Slade, 2008) indicated that dismissing patients are likely to do better in psychotherapy than those with an anxious attachment. This result indicates that the intensity of avoidant attachment may play a differential role in clinical outcome. It has been suggested that individuals can favor anxious or avoidant attachment strategies in a more secure or organized manner or in a more insecure or disorganized manner, and that lower organization is likely to be associated with worse functioning and greater disturbance (Slade, 2008). Drawing on these notions, it might be argued that clinical outcome may vary in patients with avoidant attachment depending on the degree of rigidity and self-defeating nature of their defensive strategies as well as the flexibility and vulnerability of their organizational abilities.

Regarding secure attachment, results revealed that ARMS patients with higher baseline secure attachment experienced greater improvement in functioning over 12 months of psychosocial treatment. Other investigations have also found that secure attachment predicted better functioning in different types of mental disorders (e.g., Meyer et al., 2001). Similarly, we previously found that secure attachment predicted better functioning after 6 months of treatment in ARMS patients (Quijada et al., 2012). In that study secure attachment also predicted improvement in psychoticism and disorganization, but these associations have not emerged at the one-year follow-up. According to the social cognitive model of attachment (Baldwin et al., 1996), in addition to more stable attachment models, individuals could also hold different models

or relational schemas that can be activated by particular circumstances (Davila et al., 1999). Psychosocial interventions might elicit secure schemas of attachment and have an impact on functioning in the long term; however, at a symptom level, with greater cognitive and emotional components, the activation of secure models may only last for the initial periods of therapy while the therapeutic alliance is building. On the other hand, the predominant insecure attachment styles might have an influence on symptoms over the long-term. In fact, only 3 patients changed at the 12-month follow-up from insecure to secure attachment, and the others did so from an insecure prototype to another insecure prototype. This is consistent with previous studies that found that some individuals did not become secure over the course of the treatment period, but instead changed to a different insecure style (Diamond et al., 1999 and Travis et al., 2001).

The hypothesis that increases in secure attachment and decreases in insecure attachment across the 12 months of treatment would be associated with better outcomes over-and-above the effect of baseline symptom severity was partially confirmed. A decrease in preoccupied attachment was related to improvement in positive symptoms, negative symptoms, general psychopathology, and total symptoms. The finding resonates with the work of Berry et al. (2008a), who found a positive association between changes in attachment anxiety and changes in total symptoms and hallucinations at follow-up in patients with psychosis.

The positive impact of change in preoccupied attachment on all symptom scales in ARMS patients is probably related to its intrinsic characteristics: a negative model of the self and external evaluation as a source of self-confirmation. The protective therapeutic setting may strengthen the capacity to perceive others in a positive way, thus validating the therapeutic space as a source of personal confirmation. In this way, psychosocial treatment could help to diminish a negative model of the self and reinforce better self-esteem. This change process might explain symptom improvement given that a negative view of the self and/or poor self-esteem have been associated with risk for developing psychosis (Krabbendam et al., 2002) as well as with increased hallucinations and paranoia (e.g., Smith et al., 2006, Romm et al., 2011 and Fisher et al., 2012). It would be relevant for future studies to examine whether, and if so, what specific characteristics of psychosocial interventions for ARMS patients may contribute to lowering levels of preoccupied attachment and how this may be associated with beneficial effects in terms of symptom course.

It is surprising that change in secure attachment was not associated with change in symptoms as expected. It is likely that the association between attachment and clinical outcome actually emerges from the change in negative self and other models, which are thought to be relevant for the development of psychotic symptoms. Therefore, our findings suggest that disconfirming existing negative working models may be crucial for symptomatic change to occur.

As regards to the prevalence of attachment styles, we found that the predominant styles in this sample were preoccupied and fearful, which is in accordance with a recent study with at-risk individuals (Gajwani et al., 2013). This, however, is in contrast with previous studies with psychosis samples, which have generally found that dismissing attachment is the most prevalent style (see Harder, 2014). Although there is little investigation in ARMS populations, the higher prevalence of the fearful and preoccupied styles suggests that features such as a negative view of the self and anxiety about separation/rejection may be more pervasive in the at-risk stage.

In terms of the stability of attachment, the results indicated a moderate degree of stability, with the exception of the fearful prototype. Although the reason for this finding is unclear, fearful attachment has been considered similar to disorganized attachment (e.g., Johnson, 2008), which involves more fragmented models as well as inconsistent or oscillating attachment strategies. It has been proposed that individuals with unclear working models are more prone to change their attachment patterns (Davila and Cobb, 2004), so this may be one reason for the low stability associated with fearful attachment in the present study.

It is important to note that the sample showed a tendency towards general improvement, reaching statistical significance for functioning, general psychopathology, and total symptomatology. These results are especially encouraging given that a recent meta-analysis estimated that the transition risk in the first year after clinical presentation was 21.7% (Fusar-Poli et al., 2012). Also, the clinical improvement becomes more striking since the majority of ARMS patients in this sample came from low socioeconomic levels and lived in a densely urbanized sector, two factors associated with the presence of psychotic symptoms and a greater risk of psychosis (Olfson et al., 2002, van Os et al., 2003, Krabbendam and van Os, 2005 and Ellett et al., 2008). Although our aims did not center on treatment effects, these results are optimistic about the potential positive effects of psychosocial interventions. Nevertheless, other factors may have contributed to explain the global improvement, such as the young age of the sample (which has been related to lower transition rates), selection criteria (Fusar-Poli et al., 2012), and the use of principal outcome measures not specially designed for ARMS patients.

The results of this study must be interpreted considering several strengths and limitations. An important asset of this work is that few studies have studied attachment in ARMS individuals, and the present study employed a longitudinal design examining attachment and symptom/functioning change with multilevel modeling techniques. In terms of shortcomings, overall the sample size was rather limited and the study suffered from a high attrition rate from the initially screened group of patients – although the study followed a relatively difficult patient group to recruit and retain for 12 months. Also, the assessment of the therapist was considered in the evaluation of attachment in order to avoid a potential bias in patients′ self-report due to the current clinical state, and no reliability testing was done amongst the raters on the attachment measure. Future studies should investigate the convenience of using patients′ self-report or a combined approach, as well as taking into account the attachment style of the intervening professionals, because these have been shown to affect the relationship with patients with psychosis (Tyrrell et al., 1999 and Berry et al., 2008b). Additionally, it should be noted that this work was begun before the Psychosis Attachment Measure (PAM; Berry et al., 2006) was available for use in Spanish-speaking populations (Sheinbaum et al., 2013b). Future studies might consider using the PAM given that the instrument was specifically designed to measure attachment in psychosis. Another consideration is that different factors can contribute to change in attachment, like the meaning of life events or losses (Davila and Sargent, 2003), and these were not evaluated in the present study. Our findings suggest that it may be useful in future studies to examine the role of therapeutic alliance and service engagement, especially considering that both variables are associated with treatment outcome (Dozier et al., 2001 and Kvrgic et al., 2011) and attachment in psychosis (Picken et al., 2010). Additionally, given that sex differences have been found in the expression of symptoms and functioning in ARMS

patients (Barajas et al., 2015), it would be relevant for future research to consider whether the role of attachment in predicting clinical/functional outcome varies for men and women. Finally, it would also be important for future work to examine how attachment style interacts with other factors, such as reflective functioning, insight, and expressed emotion, which have been related to attachment style and outcome (Quijada et al., 2014).

To conclude, this study continued to explore the potential role of attachment in the clinical outcome of ARMS patients in the context of a psychosocial intervention. The results indicated that the intensity of insecure attachment plays a role in the clinical outcome in the at-risk stage and that focusing on lowering attachment insecurity may offer a more comprehensive approach to psychotherapy than categorical conceptions of attachment. Our findings strengthen the importance of considering both the attachment prototype of ARMS patients and its intensity for the design of treatment strategies.

Contributors

Authors Quijada and Barrantes-Vidal contributed to the study design, literature review and writing of the manuscript. Tizón made the clinical diagnostic assessment and contributed to writing of the manuscript. Kwapil performed the statistical analyses and contributed to writing of the manuscript. Sheinbaum contributed to the literature review and writing of the manuscript. All authors have read and approved the final manuscript.

Conflict of interest

None.

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1. Note that there is not a unique nomenclature of attachment given the range of attachment models and measures that exist. Within this article, we identified the dismissing and fearful prototypes as avoidant attachment and the preoccupied prototype as anxious attachment. Also, we refer to these three prototypes as insecure attachment.