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Attachment, Social Cognition, and Social Relationships

Abstract

Individuals who experience psychosis typically have diminished social networks and difficulties with social and interpersonal functioning. Therefore, factors underlying social functioning are an intensively studied topic. As attachment theory is by its very nature a theory about interpersonal relationships, it provides insight into these difficulties experienced in psychosis and helps to further develop existing models and conceptualisations of psychosis. Another factor closely related to social dysfunction is social cognition, referring to skill sets or mental processes which help an individual to understand and to accurately interpret the social world. Secure attachment bonds provide optimal conditions for the development of these skills and can be disrupted by negative interpersonal experiences, including difficulties in early attachment relationships. In this chapter, we discuss state of the art research on the link between social cognition, interpersonal difficulties and attachment style in psychosis.

Social and Interpersonal Functioning in Psychosis

Much research has demonstrated that social relationships serve as an important risk or protective factor for a host of problems, from physical health and life satisfaction (Steptoe et al., 2013), to psychiatric conditions ranging from depression (Hall-Lande et al., 2007) to psychosis (Cornblatt et al., 2012). The impact of social relationships and social functioning on psychosis is especially important, as marked problems establishing and maintaining social connections and performing typical social behaviours (e.g., identifying and responding to social cues) have been found across the course of psychosis (e.g., Addington et al., 2008; Bora & Pantelis, 2013). Subtle social functioning problems are present in at least some individuals with psychosis many years prior to illness onset. For example, behavioural abnormalities were found in childhood videos of individuals who developed psychosis in adulthood (Schiffman et al., 2004). Furthermore, studies of individuals at risk for psychosis have found social problems in people identified as high in social anhedonia or schizotypy (a risk factor for schizophrenia, but with no clinical diagnosis at the time of assessment; Llerena et al., 2012); those with genetic risk for psychosis (e.g. siblings; Shapiro et al., 2009), and persons at ultra-high risk (UHR) for psychosis (Cornblatt et al., 2003; Velthorst et al., 2010). In fact, social isolation has been identified as an important factor in predicting ultimate transition to psychosis in individuals at UHR (Cornblatt et al., 2012).

The pervasive problems with social relationships have important implications for individuals with psychosis. For example, improving social relationships and making friends are often identified by service users as important treatment goals, but current treatments either do not adequately address these concerns or do not produce adequate improvement in social functioning (Perkins, 2001). In addition, when one has difficulty interacting with others successfully, it tends to affect a variety of other outcomes, such as the ability to obtain and maintain employment, and the ability to fully engage with treatment and establish a productive working alliance. Besides, some individuals with psychosis also have problems with aggression or hostility in their interactions with others (Bartells et al., 1991, Darrell-Berry et al., submitted), which can not only impair social relationships further, but also produces other significant problems such as legal troubles and incarceration.

Social Cognition and Social Relationships

Given the debilitating role of social impairment in psychosis, there is a strong interest in its underlying driving factors. Unravelling these factors will enable targeted interventions to improve daily life outcomes of service users. One of the key factors of interest that came into focus as a potential explanatory factor of social dysfunction is social cognition. Social cognition refers to information processing within social and emotional contexts (Adolphs, 1999) and comprises functions such as emotion perception (EP), social perception (SP), theory of mind, and empathy, which are necessary to understand social stimuli and interpersonal cues (Couture et al. 2006). As such, these mechanisms enable humans to act appropriately in response to their social environment. For example, social signals of others such as facial expressions or gaze direction can convey valuable information about danger in the environment or can indicate pleasant or desirable events (Frith & Frith, 2006). The ability to correctly perceive and interpret emotions is required to decode these social signals and to give them meaning. Subsequently, appropriate behavioural action can be taken.

Other higher-level social cognitive skills such as theory of mind'' (ToM) and 'mentalization' are the foundation of smooth social interactions and enable humans to form long lasting relationships and to function in the social community (Frith, 2007). ToM is the ability to take another person's perspective into account and to make attributions about their mental states. The skill of reasoning about mental states involves using the advanced skill of false belief (Sabbagh, 2004). Even though attempts to distinguish between cognitive and affective ToM have been performed, it has been argued that ToM has its main focus on cognitive aspects and discounts interpersonal emotional aspects (Fonagy et al., 2007; Kalbe et al., 2007). Mentalization, on the other hand, is a form of social cognition, closely related to 'Theory of Mind' which enables individuals to think about and ascribe cognitive and affective mental states to self and others by understanding behaviour in terms of intentional mental states (e.g. needs, desires, feelings, beliefs, goals, purposes and reasons; Fonagy, Bateman & Luyten, 2012). In addition, the process of mentalization involves regulation of emotions through the understanding of others' emotions.

While these social cognitive processes come naturally to most human adults, they undergo a long developmental process throughout childhood into late adolescence (Hughes, 2004). For example, the inclination to take others' perspectives into account increases until late adolescence (Dumontheil et al., 2010a). This is important with regard to the understanding of social dysfunction in psychosis, because adolescence is a time that is not only marked by many changes in social environments (e.g., independence of parents, increased contacts with peers, and the establishment of first romantic relationships), but it is also the peak onset time of psychosis. The illness onset is likely to interfere with the final developmental stages of social cognition and prevents young individuals who experience psychosis from reaching crucial milestones in the development of social relationships.

Social cognitive theory implies a close association between social cognition and functional outcome, and research has shown that psychosis is associated with wide ranging deficits in social cognition (Savla et al., 2012). A vast amount of studies corroborated the relationship between

social cognitive deficits, particularly in ToM, and impairments in social functioning in psychosis (Fett et al., 2011). It has been suggested that a reduced ability to understand others and to understand how to relay the “right” social signals in return leads to difficulties in social communication, including misunderstandings, conflicts, and increased interpersonal distress. Another cognitive mechanism that has been linked to problematic social behaviour in psychosis is a biased attributional style, whereby particularly negative events are attributed to other people rather than the circumstances (Martin and Penn, 2002). Taken together, these difficulties in social cognition and communication may ultimately lead to social exclusion and withdrawal (see Figure 1; Cotter et al., 2015; Couture et al., 2006; Fett et al., 2012). Previously discussed studies investigated social cognition by means of paradigms that require participants to interpret social stimuli in stories, cartoons or pictures. These studies yielded important insights into social cognitive mechanisms, but could not capture the most intrinsic and interactive aspect of social behaviour. Research on the mechanisms by which social cognitive deficits influence social functioning is still scarce. Only recently empirical studies started to employ interactive research designs that enable the investigation of social interactions while they take place. Interactive game-theoretical exchange paradigms from experimental economics paradigms now allow for the ‘online’ investigation of social processes (e.g. trust, reciprocity or fairness) and offer a new way to study social dysfunction in psychopathology (Sharp, Monterosso and Montague, 2012). Research with such paradigms has associated psychosis with reduced trust towards others and a reduced sensitivity to others’ pro-social signals compared to controls. As a result social interactions were less positive and cooperative in those with a psychotic illness. First-degree relatives with an increased genetic risk for the illness also showed reduced trust towards unknown others but were able to adjust their behaviour in response to benevolent behaviour of the social interaction partner, i.e. over time they established a positive relationship with the interaction partner. This highlights the importance of the sensitivity to other’s social signal for the development of smooth social interactions (Fett et al., 2012).

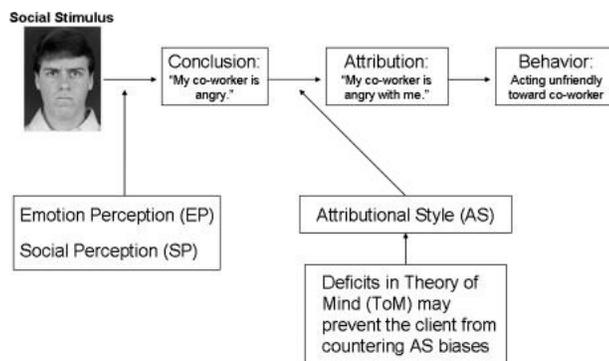


Figure 1. Conceptual Framework for Understanding the Interplay Between Social Cognition and Social Functioning (from Couture et al. 2006)

Social Cognition and Attachment Style

Attachment security is another possible explanatory factor of social dysfunction. Levels of secure attachment are reduced in psychosis. This is highly relevant for interpersonal functioning. Research in individuals without any psychiatric diagnosis consistently suggests that securely

attached individuals hold more positive beliefs about others and that this could account for stronger affiliative behaviour in a variety of social settings, including close but also more distant social relationships (Van Lange et al., 1997). It is thought that the internal working models of relationships developed through early attachment experiences tend to be maintained across the lifespan because these working models serve to bias perception and cognition and affect individuals' selection of social relationships (Simons et al., 2001).

Recent theoretical advances (e.g., Berry et al., 2007, Korver-Nieberg et al., 2013) have suggested that social cognition may act as a mediator between insecure attachment and subsequent social difficulties. Specifically, the biased perception of others that is influenced by the internal working models of relationships may fundamentally impact on how individuals with psychosis perceive their social world. In healthy adults, it has been found that an individual with an anxious attachment style hyper activates the levels of distress to get their attachment needs by demonstrating an overly demanding interpersonal style, combined with a fear of rejection, a negative self-image and negative affect (Mikulincer & Shaver, 2007, Berry et al., 2007). Another way of getting attachment needs met in times of distress is exhibited by individuals with an avoidant attachment style who deactivate the levels of distress by demonstrating interpersonal hostility, a negative view of others, avoidance of close relationships, social withdrawal and defensive low levels of affect (Mikulincer & Shaver, 2007, Berry et al., 2007). Thus, the theory sets the stage for how attachment style, social cognition and social relationships may be intertwined in psychosis.

It has been suggested that the development of an insecure attachment style in childhood, may cause problems in the development of social cognitive skills throughout childhood and adolescence. That is, since insecure attachment style is characterized by negative views about the likelihood of acceptance, reassurance and safety in interpersonal relationships, it may promote greater withdrawal from social relationships (thereby decreasing the opportunities for learning), and/or produce a cognitive bias in which the developing child is interpreting social interactions through a distorted lens. The continued presence of the insecure internal working model of relationships combined with poor social cognitive skills (serving as a mediator of the attachment—social functioning relationship) could result in the pronounced social difficulties observed in psychosis, including small social networks (Berry et al., 2007), hostile or aggressive behaviour (Bartells et al., 1991, Darrell-Berry et al., submitted), and problems establishing therapeutic alliance with providers and services (Berry et al., 2008; Kvirgic et al., 2013). Figure 2 shows this proposed theoretical model of the development of interpersonal difficulties in psychosis, which is currently being empirically tested (Palmier-Claus et al., submitted). Other research teams have speculated about a very similar theoretical link between attachment and social relationships via social cognition, and new mentalization-based treatments are grounded in this theory (e.g., Brent et al., 2014).

Figure 2 model of the proposed pathway to interpersonal difficulties in psychosis

Evidence Supporting Social Cognition as a Mediator Between Attachment Style and Social Dysfunction

In this section, we examine evidence that is supportive or suggestive of the links in our proposed model, referencing both the literature on attachment in non-clinical populations, as well as studies specific to psychosis.

Early adversity and attachment. The first part of the model suggests a link between early adverse experiences and insecure attachment. Research has shown that higher levels of attachment anxiety are related to a greater amount of interpersonal traumas (Picken, Berry, Tarrier, & Barrowclough, 2010, (Cotter, Kaess and Yung, 2015). This is important because it is evident that a large proportion of individuals with psychosis have experienced a traumatic event (Read, van Morrison, & Ross, 2005), which may account for evident changes in attachment. This idea is also supported by findings showing significantly higher rates of insecure attachment in psychotic populations (Berry et al., 2007). In schizophrenia early adversity has been associated with a lower age at first hospitalization and a larger number of hospitalizations. In addition, early childhood adversity has been associated with worse premorbid social functioning and social impairment in adult patients with psychosis (Cotter et al., 2015). The association between early adversity and attachment is discussed more fully elsewhere in this book, so we refer the reader to those sections. However, we would like to note that structural and neurochemical abnormalities that have been linked to the experience of childhood trauma and early adversity might present an important underlying mechanisms of the association between trauma, attachment and social cognition which is explained in the following paragraph (for a review see Cotter et al., 2015).

Attachment and Social Cognition. A key association in the model is the link between attachment and social cognition and the mediational role of social cognition in psychosis.

Non-clinical samples

Existing research supports an association between attachment and social cognition in non-clinical populations. Specifically, in one study, healthy adolescents were asked to make attributions about ambiguous hypothetical social events, akin to measures of attributional style (Simons et al., 2001). For example, participants were presented with four hypothetical scenarios involving a peer and were asked to evaluate how hostile they perceived the hypothetical peer to be, and to which degree they thought that this behaviour was intentional (events included: not being allowed to sit with peers at a lunchroom table, getting books knocked out of one's hands in the hallway by a peer, being refused to borrow a pencil by a peer, and being hit in the back with a basketball during gym class). The intentions of the hypothetical peer were kept vague intentionally. Social cognition, as measured by attributions about the intentional negative intentions of peers in response to ambiguous stimuli, was found to mediate the relationship between attachment security (with regard to the mother relationship) and self-reported aggression (though notably not aggression reported by either parents or teachers; Simons et al., 2001). That is, poorer relationship

quality with the mother was associated with an increased tendency to make negative attributions about peer behaviour, as well as the adolescents' report of aggressive behaviour. Similarly, Collins (1996) also found evidence for a link between attributions and attachment style in university students. Securely attached individuals were more likely to make attributions that minimized the negative impact of hypothetical social events (e.g., a romantic partner forgot the participant's birthday) and tended to make attributions that viewed the interaction partner in the best light possible (i.e., unstable and external attributions). In contrast, insecurely attached individuals were much more likely to provide negative explanations for these events (e.g., attributions of untrustworthiness and perceived rejection); moreover, these attributions about others' behaviour mediated the relationship between attachment style and the participants' own behavioural intentions towards others (i.e. what the participant indicated she would do in that situation (Collins, 1996).

Attachment has also been proposed to impact on emotion perception, or the ability to detect emotional cues from a variety of stimuli including facial expressions, vocal tone and body language. Several theorists agree that a link between attachment and emotion perception is highly plausible given that attachment may influence the tendency of an individual to attend to and to encode emotional information from his/her environment (Feeney, Noller, & Callan, 1994; Tucker & Anders, 1999). In support of this idea, Magai and colleagues (1995) found that individuals who were securely attached had high levels of accuracy in detecting negative emotions from facial expressions, whereas insecurely attached individuals were less accurate. Similarly, Kafetsios (2004) found that securely attached adults were more accurate in their answers across domains of the Mayer-Salovey-Caruso Emotional Intelligence Test (Mayer, et al., 2004) compared to insecurely attached participants, whereas participants classified as "preoccupied" performed significantly worse on the emotion perception component (fearful-avoidant demonstrated a similar pattern, but this was not statistically significant). Interestingly, dismissing-avoidant participants demonstrated *intact* performance on emotion perception, which the author suggested could be due to a fundamentally different interaction with emotions in this group compared to other insecurely attached groups. That is, both preoccupied and fearful-avoidant individuals tend to demonstrate a stronger emotional response to social stimuli than dismissing-avoidant or securely attached individuals, and thus since dismissing-avoidant individuals do not experience greater emotional arousal when confronted with social stimuli, they are perhaps better able to encode and process social information (Searle & Meara, 1999).

Finally, with regard to ToM, it has been found that children with insecure attachment styles and maltreatment histories exhibit delays in acquiring ToM (Sharp & Fonagy, 2008). An innovative neuroimaging study by Nolte et al. (2013) explored ToM in adults using the Reading the Mind in the Eyes Task. Participants were asked to complete the task under normal conditions and in an "attachment stress induction" condition, which involved creating an imagery script from a participant's report of a stressful event from the past year which involved a significant other. Participants were asked to rate the level of stress they experienced. The researchers however failed to check whether the attachment system was activated and differed from non-attachment stress. They found, however, that the attachment stress induction significantly reduced accuracy and reaction times on the task. In addition, they found evidence of reduced neural activity after

the attachment-stress induction during the ToM task. Specifically, there was less activation in the left posterior superior temporal sulcus, temporal parietal junction and inferior fusiform gyrus. Thus, activating attachment states of mind reduced accuracy on a social cognitive task and impacted the neural network that are involved in processing these stimuli. Due to the lack of manipulation checks however, these findings need to be interpreted with caution.

Clinical samples

In chronic outpatients with a diagnosis of schizophrenia, secure attachment style was associated with lower levels of the personalising attribution bias (i.e., the tendency to blame others for negative events), although insecure attachment was not associated with attributional style (Donohoe et al., 2008). Korver-Nieberg, et al., (2013) revealed that perspective taking as a basic cognitive ToM component was unrelated to either attachment or paranoid thoughts in adolescents with an early onset of psychosis and a control sample. A second study by Pos and colleagues (2014) examined both cognitive and affective ToM in a sample of patients, healthy siblings and controls. In this study both components of ToM were related to insecure attachment, with stronger associations in affective ToM. The discrepant findings on cognitive ToM between the two studies may be explained by the differential operationalization of cognitive ToM. Whereas the first study assessed cognitive ToM as a basic perspective taking skill, assessed with the perspective-taking task (Dumontheil et al., 2010b), the second tapped into more complex cognitive ToM skills, assessed with the shortened version of the Conflicting Beliefs and Emotions (CBE) (Shaw et al., 2004) closer to mentalizing skills. Together, these findings suggest insecure attachment and ToM skills to be involved in the development of interpersonal difficulties in psychosis.

Mentalization can be operationalized as reflective functioning, which is typically rated based on utterances during interviews with participants. Interviews are rated for how well the individual is able to understand thoughts, feelings, intentions and goals of both themselves and others. MacBeth and colleagues (2011) examined reflective functioning and attachment in first episode psychosis. They found that reflective functioning was associated with both insecure attachment and poorer social functioning (as indicated by GAF scores), and that securely attached individuals were more likely to be engaged with clinical services. The findings indicated that patients with higher levels of attachment avoidance had lower mentalization skills than patients with an anxious or secure attachment style. The discrepancy between this finding and the previously mentioned study by Searle & Meara (1999) might be due to the different levels of encoding and processing of social information measured, as opposed to the different types of attachment styles.

Attachment and Social Relationships. In the preceding section, we referenced some of the evidence which supports a connection between attachment style and social relationships in psychosis. We will elaborate the discussion of this connection here. First, we know that attachment styles are good predictors of interpersonal functioning in healthy adults (Crowell, Fraley, & Shaver, 1999). Similarly, related to the emphasis on aggressive behaviour above, the influence of insecure attachment on elevated aggression in pre-schoolers (Erikson, Sroufe, & Egeland, 1985) and throughout childhood (Lyons-Ruth, Alpern & Repacholi, 1993) has been documented.

With regard to psychosis, early research has suggested that attachment style (particularly dismissing/avoidant) is associated with being less likely to disclose symptoms and with being less likely to engage with treatment (Dozier, 1990), a finding supported by later work (Dozier, Lomax, Tyrrel & Lee, 2001; Tait, Birchwood & Trower, 2004). Berry and colleagues (2008) investigated interpersonal problems in individuals with psychosis and found that attachment anxiety was associated with overly demanding behaviour and attachment avoidance was associated with interpersonal hostility, as measured by reports of psychiatric staff. Similarly, two reviews of attachment and psychosis concluded that secure attachment was associated with better engagement with treatment providers and conversely that insecure attachment was associated with disengagement (Korver-Nieberg et al., 2013; Gumley et al., 2014). Furthermore, Michail and Birchwood (2014) found that insecure attachment was elevated in individuals with psychosis who had comorbid social anxiety. Similarly, in a study of ultra-high risk patients, Quijada and colleagues (in press) found that higher levels of secure attachment were associated with improved functioning scores after one year of treatment. Thus, secure attachment in psychosis seems to be linked with less impaired social behaviour and improved connection with services and treatment providers.

Social Cognition and Social Relationships. The middle chain of the model highlights the previously discussed link between social cognition and social outcomes. As alluded to above, this is a relationship which has been consistently found in the literature (Fett et al. 2011). In addition, others have examined whether social cognition can explain hostile or aggressive behaviour, which also interferes with optimal community functioning. The preponderance of evidence appears to support the influence of social cognition on these behaviours as well. Specifically, Bo and colleagues (2014) found that deficient affective ToM (inferences about feelings) and intact cognitive ToM (inferences about beliefs) were associated with increased incidence of aggression in psychosis. With regard to attributional style, a recent review of the literature (though preliminary) is suggestive of a relationship between externalising (i.e., attributing the causes for negative events to external, rather than internal, causes) and hostile (i.e., personalising bias, where negative events are attributed to others, specifically with malintent) attribution biases and violence in psychosis (Harris et al., 2014). Interestingly, both findings suggest that social cognition influences aggressive behaviour in that individuals with social cognitive abnormalities or biases are more likely to conclude that negative occurrences are the result of other's actions, that others' deliberately intended to cause these negative events, and that a lack of ability to appreciate the emotional experiences of others combined cause a higher risk for overt aggressive behaviour. It is important to note this pattern is very similar to the attributional bias reported in non-clinical sample in individuals with insecure attachment.

Conclusions and Clinical Implications

There are substantial theoretical reasons and initial evidence from research that support an important link between attachment and social cognition in psychosis, as well as a potentially crucial role of social cognition as a mediator between attachment and functioning within social relationships (Darrell-Berry et al., submitted, Palmier-Claus et al., submitted).

It is important for future work to consider the different social cognitive skills in exploring this question further (e.g. mentalization, emotion perception, ToM, attributional style). For each social cognitive domain there are relevant theoretical rationales for their linkage with attachment. Emotion perception and ToM have clear links with functioning in social relationships, and research suggests that attributional style may be important for understanding hostile or aggressive behaviour in psychosis. It may also be useful to separate ToM tasks into those that tap cognitive versus affective ToM (Abu-Akel & Shamay-Tsoory, 2011), as it is possible that there could be differential relationships between a cognitive understanding of others' mental states versus a more emotional connection with them (as evident in the work on aggression and other clinical pictures such as psychopathy).

Adolescence as the developmental period with the highest incidence of psychosis is a period where attachment issues are paramount. Internal working models developed in early parental relationships are further strengthened (or in some cases altered) by the formation of important interpersonal relationships in adolescence. In addition, it is a time where social cognitive skills are being further refined and developed. There is some reason to believe social cognitive deficits may be subtler during the high-risk period as compared to clinical states (e.g., Couture et al., 2008). The adolescent period may therefore be an optimal time for interventions that aim to produce changes in both attachment and social cognitive ability, which could help to mitigate some of the deliberating social dysfunction in psychosis.

As argued, attachment is crucial for the development of interpersonal functioning in adult life. As mentalization abilities might be amenable to change (Bateman and Fonagy, 2011), they should be a focus of treatment in psychosis. In order to understand the origin and persistence of psychotic symptoms and interpersonal dysfunction in terms of attachment behaviours, Clinicians should include routine questions about early attachment relationships and early adverse events that may have impacted on mentalization abilities and the development of a secure adult attachment style in their treatment. This could give clinicians and, more importantly, patients, more insight into their interpersonal experiences and the way these may have influenced their social situation and coping strategies. Clinicians may use this knowledge by reframing the origin and persistence of problematic interpersonal behaviour in terms of attachment behaviours, which used to be functional and understandable in earlier relationships. This may provide a 'normalising perspective' from which exploration and practice of alternative social beliefs and skills could be derived as a focus of treatment.

Abu-Akel A, Shamay-Tsoory S. Neuroanatomical and neurochemical bases of theory of mind. *Neuropsychologia*, 2011. 49(11):2971–2984.

Adolphs, R., Social cognition and the human brain. *Trends in Cognitive Sciences*, 1999. 3(12): p. 469-479.

Bartels, S.J. Drake, R.E.; Wallach, M.A. Freeman, D. Characteristic hostility in schizophrenic outpatients. *Schizophrenia Bulletin*, 1991. 17(1), 163-171.

Bartholomew, Kim, and Leonard M. Horowitz. "Attachment styles among young adults: a test of a four-category model." *Journal of personality and social psychology* 61.2 (1991): 226.

Bateman, A.W. & Fonagy, P. (2012). *Handbook of Mentalizing in mental health practice*. Washington, DC; London: American Psychiatric Publishing, Inc.

Berry, K., Wearden, A., & Barrowclough, C. (2007). Adult attachment styles and psychosis: An investigation of associations between general attachment styles and attachment relationships with specific others.

Berry, K., Band, R., Corcoran, R., Barrowclough, C., & Wearden, A. (2007). Attachment styles, earlier interpersonal relationships and schizotypy in a non-clinical sample. *Psychology and Psychotherapy-Theory Research and Practice*, 80, 563-576. doi: 10.1348/147608307X188368.

Berry, K., Barrowclough, C., & Wearden, A. (2007). A review of the role of adult attachment style in psychosis: Unexplored issues and questions for further research. *Clinical Psychology Review*, 27, 458-475. doi: 10.1016/j.cpr.2006.09.006.

Berry, K., Barrowclough, C., & Wearden, A. (2008). Attachment theory: A framework for understanding symptoms and interpersonal relationships in psychosis. *Behaviour Research and Therapy*, 46, 1275-1282. doi: 10.1016/j.brat.2008.08.009.

Bora, E., & Pantelis, C. (2013). Theory of mind impairments in first-episode psychosis, individuals at ultra-high risk for psychosis and in first-degree relatives for schizophrenia: Systematic review and meta-analysis. *Schizophrenia Research*, 144, 31-36.

Brent, B.K., Holt, D.J., Keshavan, M.S., Seidman, L.J., & Fonagy, P. (2014). Mentalization-based treatment for psychosis: Linking an attachment-based model to the psychotherapy for impaired mental state understanding in people with psychotic disorders. *Isr J Psychiatry Relat Sci*, 51(1), 17-24.

Collins, N.L. (1996). Working models of attachment: Implications for explanation, emotion, and behaviour. *Journal of Personality and Social Psychology*, 71(4), 810-832.

Cornblatt, B.A., Carrion, R.E., Addington, J., Seidman, L., et al. (2012). Risk factors for psychosis: Impaired social and role functioning. *Schizophrenia Bulletin*, 38, 1247-1257.

Cotter, J., Kaess, M., & Yung, A.R. (2015). Childhood trauma and functional disability in psychosis, bipolar disorder and borderline personality disorder: A review of the literature. *Irish Journal of Psychological Medicine*, 32, 21-30.

Couture, S.M., D.L. Penn, and D.L. Roberts, The functional significance of social cognition in schizophrenia: a review. *Schizophr Bull*, 2006. 32 Suppl 1: p. S44-63.

Darrell-Berry^H. Bucci, S., Palmier-Claus, J., Emsley, R., Drake, R., Berry, K. Predictors and Mediators of Trait Anger across the Psychosis Continuum: the role of attachment style, paranoia and social cognition

DeWall CN, Masten CL, Powell C, Combs D, Schurtz DR, Eisenberger NI (2012) Do neural responses to rejection depend on attachment style? An fMRI study. *Soc Cogn Affect Neurosci* 7(2):184–192.

Donohoe, G., Spoletini, I., McGlade, N., Behan, C., et al. (2008). Are relational style and neuropsychological performance predictors of social attributions in chronic schizophrenia? *Psychiatry Research*, 161, 19-27.

Dumontheil, I., Apperly, I.A. and Blakemore. S.J. (2010a), Online usage of theory of mind continues to develop in late adolescence. *Developmental Science*. 13(2): p. 331-338.

Dumontheil I., Kuster O, Apperly I.A. and Blakemore S.J. (2010b) Taking perspective into account in a communicative task. *NeuroImage* 52(1095-9572; 1053-8119; 4): 1574-1583.

Feeney, Judith A., Patricia Noller, and Victor J. Callan. "Attachment style, communication and satisfaction in the early years of marriage." (1994).

Fett, A.-K.J., et al., To trust or not to trust: the dynamics of social interaction in psychosis. *Brain*, 2012. 135(3): p. 976-984.

Fett, A.-K.J., et al., The relationship between neurocognition and social cognition with functional outcomes in schizophrenia: A meta-analysis. *Neuroscience & Biobehavioral Reviews*, 2011. 35(3): p. 573-588.

Fett, A.-K.J, Shergill, S. & Krabbendam, L. Social neuroscience in psychiatry: unravelling the neural mechanisms of social dysfunction. *Psychological Medicine*, 2015, 45(6):1145-65.

Fonagy, P., Bateman, A.W., & Luyten, P. (2012). Introduction and overview. In Bateman, A.W., & Fonagy, P (Eds.), *Handbook of Mentalizing in mental health practice* (pp. 3-42). Washington, DC; London: American Psychiatric Publishing, Inc.

Fonagy P, Gergely G, Target M. The parent-infant dyad and the construction of the subjective self. *J. Child Psychol. Psychiatry* 2007; 48(3–4): 288–328.

Fonagy P, Luyten P. A developmental, mentalization-based approach to the understanding and treatment of borderline personality disorder. *Dev. Psychopathol.* 2009; 21: 1355–1381.

Frith, C.D. and U. Frith, How we predict what other people are going to do. *Brain Research*, 2006. 1079(1): p. 36-46.

Frith, C.D., The Social Brain? *Philosophical Transactions: Biological Sciences*, 2007. 362(1480): p. 671-678.

Harris, S.T., Oakley, C., Picchioni, M.M. (2014). A systematic review of the association between attributional bias/interpersonal style and violence in schizophrenia/psychosis. *Aggression and Violent Behaviour*, 19, 235-241.

Hall-Lande, J.A., Eisenberg, M.E., Christenson, S.L., & Neumark-Sztainer, D. (2007). Social isolation, psychological health, and protective factors in adolescence. *Adolescence*, 42, 265.

Hughes, C., What are the links between theory of mind and social relations? Review, reflections and new directions for studies of typical and atypical development. *Social Development*, 2004. 13(4): p. 590-619.

Llerena, K., Park, S.G., Couture, S.M., & Blanchard, J.J. (2012). Social anhedonia and affiliation: Examining behaviour and subjective reactions within a social interaction. *Psychiatry Research*, 200, 679-86.

Kafetsios, K. (2004). Attachment and emotional intelligence abilities across the life course. *Personality and Individual Differences*, 37, 129-145.

Kalbe E, Grabenhorst F, Brand M, Kessler J, Hilker R, Markowitsch HJ. Elevated emotional reactivity in affective but not cognitive components of theory of mind: A psychophysiological study. *J. Neuropsychol.* 2007; 1: 27–38.

Kvrgic, Sara, et al. "Therapeutic Alliance in schizophrenia: The role of recovery orientation, self-stigma, and insight." *Psychiatry research* 209.1 (2013): 15-20.

Korver-Nieberg, N., Fett, A.J., Meijer, C.J., Koeter, M.W.J., Shergill, S.S., de Haan, L., & Krabbendam, L. (2013). Theory of mind, insecure attachment and paranoia in adolescents with early psychosis and healthy controls. *Australian and New Zealand Journal of Psychiatry*, 47 (8), 737 - 745.

Korver-Nieberg, N., Berry, K., Meijer, C.J., & de Haan, L. (2013). Adult attachment and psychotic phenomenology in clinical and non-clinical samples: A systematic review. *Psychology and Psychotherapy: Theory, Research and Practice, in press*. doi: 10.1111/papt.12010. [Epub ahead of print] PubMed PMID: 23818184.

Mayer, J. D., Salovey, P., Caruso, D. R., & Sitarenios, G. (2003). Measuring emotional intelligence with the MSCEIT V2.0. *Emotion*, 3, 97-105.)

Martin, J.A. and D.L. Penn, *Attributional style in schizophrenia: an investigation in outpatients with and without persecutory delusions*. *Schizophr Bull*, 2002. 28(1): p. 131-41

Macbeth, A., Gumley, A., Schwannauer, M., & Fisher, R. (2011). Attachment states of mind, mentalization, and their correlates in a first-episode psychosis sample. *Psychology and Psychotherapy: Theory, Research and Practice*, 84, 42-57.

Magai, Carol, Nancy Distel, and Renee Liker. "Emotion socialisation, attachment, and patterns of adult emotional traits." *Cognition & emotion* 9.5 (1995): 461-481.

Michail, M., & Birchwood, M. (2014). Social anxiety in first-episode psychosis: The role of childhood trauma and adult attachment. *Journal of Affective Disorders*, 163, 102-109.

Mikulincer, M. & Shaver, P. R. (2007). *Attachment in adulthood. Structure, dynamics and change*. New York: Guilford Press.

Nolte, T., Bolling, D.Z., Hudac, C.M., et al. (2013). Brain mechanisms underlying the impact of attachment-related stress on social cognition. *Frontiers in Human Neuroscience*, 7, 1-12.

Pos, K., Bartels-Velthuis, A.A., Simons, C.J.P., Korver-Nieberg N., Meijer, C.J., & de Haan, L., for GROUP. (2014). Theory of Mind and attachment styles in people with psychotic disorders, their siblings, and controls. *Australian and New Zealand Journal of Psychiatry*.

Quijada, Y., Kwapil, T.R., Tizon, J., Sheinbaum, T., & Barrantes-Vidal, N. (in press). Impact of attachment style on the 1-year outcome of persons with an at-risk mental state for psychosis. *Psychiatry Research*.

Sabbagh MA. Recognizing and reasoning about mental states: Understanding orbitofrontal contributions to theory of mind and autism. *Brain Cogn*. 2004; 55: 209–219.

Savla, G.N., et al., Deficits in Domains of Social Cognition in Schizophrenia: A Meta-Analysis of the Empirical Evidence. *Schizophrenia bulletin*, 2012.

Schiffman, J., Walker, E., Ekstrom, M., et al. (2004). Childhood videotapes social and neuromotor precursors of schizophrenia: A prospective investigation. *Am J Psychiatry*, 161, 2021-2027.

Shaw P, Lawrence EJ, Radbourne C, Bramham J, Polkey CE and David AS (2004) The impact of early and late damage to the human amygdala on " Theory of Mind" reasoning. *Brain* 127(7): 1535-1548.

Simons, K.J., Paternite, C.E., & Shore, C. (2001). Quality of parent/adolescent attachment and aggression in young adolescents. *Journal of Early Adolescence*, 21(2), 182-203.

Searle, G., & Meara, N. M. (1999). Affective dimensions of attachment styles: exploring self-reported attachment style, gender, and emotional experience among college students. *Journal of Counselling Psychology*, 46(2), 147–158.

Sharp C., & Fonagy P. (2008). Social cognition and attachment-related disorder. In: Sharp C, Fonagy P, Goodyer I, editors. *Social cognition and developmental psychopathology*. Oxford: Oxford University.

Sharp, C., Monterosso, J. & Montague, P. R. (2012). Neuroeconomics: a bridge for translational research. *Biol Psychiatry* **72**, 87-92.

Simpson, Jeffrey A.; Rholes, W. Steven; Phillips, Dede. Conflict in close relationships: An attachment perspective. *Journal of Personality and Social Psychology*, Vol 71(5), Nov 1996, 899-914.

Stephoe, A., Shankar, A., Demakakos, P., & Wardle, J. (2013). Social isolation, loneliness, and all-cause mortality in men and women. *Proceedings of the National Academy of Sciences*, 110(15), 5797-5801.

Tucker, Joan S., and Sherry L. Anders. "Attachment style, interpersonal perception accuracy, and relationship satisfaction in dating couples." *Personality and Social Psychology Bulletin* 25.4 (1999): 403-412.

Van Lange, P.A., et al., Development of prosocial, individualistic, and competitive orientations: theory and preliminary evidence. *Journal of personality and social psychology*, 1997. 73(4): p. 733.

Perkins, Rachel What constitutes success? The relative priority of service users' and clinicians' views of mental health services. *The British Journal of Psychiatry*, Vol 179, Jul 2001, 9-10