

Insecure Attachment in Schizophrenia

—A Wider Range of Effect

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Abstract: Attachment serves as an important framework to understand the development, onset and recovery of schizophrenia. Categories of attachment include three organized patterns (secure, dismissing, preoccupied) and one disorganized pattern. Schizophrenia is a disorder typically recognized by delusions and hallucinations, which can significantly impair the patient's normal social functioning. This article aims to summarize previous studies of attachment on schizophrenia, and provide new extensions. This paper also discusses the impact of environmental factors on schizophrenia. More importantly, dismissing and disorganized attachment serves as important predictors of positive and negative symptoms, difficult therapeutic relationship and longer course. Dismissing, preoccupied and disorganized attachment orientations also mediate childhood adversity according to previous studies. Based on analysis of cognitive and environmental factors, this article hypothesize that dismissing and preoccupied attachment also mediates schizophrenia and other environmental factors (parental age, migration and low SES). In addition, this article discusses cognitive and neuroscience evidence to prove the connections.

Keywords: dismissing attachment, delusions, preoccupied attachment, reward circuits, parental age

1. Introduction

Attachment theory is a social-developmental psychology theory, explaining different patterns of interpersonal affective bonds. These interpersonal patterns are originated from the primary interactions between infants and their caregivers, and play an important role in regulate distress, modulate affective evaluation and cognitive control during whole life-span [1]. Insecure attachment orientations, including dismissing, preoccupied and disorganized attachment links with biased insight towards self and/or others, as well as several cognitive deficits.

Schizophrenia is the most widespread mental disease around the world, restricting people's daily works and interpersonal functions. In a long-term, schizophrenia patients are labelled as "insane" and "unreasonable" by their "evil" and "horrible" behaviors. In turn, schizophrenia patients with persecutory delusions persist in negative recognition of others. Due to the misunderstanding between the two, the recovery and re-establishment of interpersonal relationship becomes more and more difficult, restricting recovery.

In this dilemma, attachment theory framework serves the key to fix the misunderstanding. Emphasizing the role of initiate nurturing, attachment theory provides people a crucial perspective to understand the similar nature of “psychosis” patients and themselves, but differed by different childhood experiences. On the other hand, providing secure attachment is beneficial for establishing trust and understanding in therapeutic alliance. Patients with the similar insight with their psychiatric doctors are less likely to form despair, promoting recovery and restricting suicide behaviors.

Previous study has investigated both direct and indirect relationships between schizophrenia and insecure attachment. This article aimed to develop this conceptual frame further, explaining insecure attachment orientations’ role in more aspects of schizophrenia, contributes in more scenarios. Another goal is to provide neuroscience and cognitive research evidences to support the mechanisms that proposed by other researches.

2. Concepts of Schizophrenia and Attachment Theory

2.1. Overview of Schizophrenia

Schizophrenia is one of the most widespread and severe mental disease among the global, affecting around 1% population’s health. As one of the most complex mental diseases, schizophrenia concludes a number of behaviors and symptoms that are not necessarily shared by all patients. According to DSM-5, schizophrenia spectrum disorder patients need to show at least two from the list of positive symptoms, negative symptoms and disorganized symptoms, includes at least one from hallucination, delusion and disorganized speech, lasting for at least one months.

It is undoubted that delusion and hallucination are the most typical and representative symptoms of schizophrenia, which affecting 50%-70% patients. Delusion is the belief that would be seen by most members of a society as misrepresentation of reality, while hallucination is the experience of sensory events without real input from surrounding environment, usually by auditory.

On the other hand, negative symptoms which influences 25% patients is defined as absence or insufficiency of normal behavior, including avolition, alogia, anhedonia, asociality, and affective flattening. Despite the two, disorganized symptoms include disorganized speech, inappropriate affect and disorganized behavior.

This mental disease usually onset in late adolescence or early adulthood, but evidence showed that there are some observed potentials in childhood and genetic expressions. 85% of patients experienced 1-2 years of prodromal stage before their syndromes reached clinical standard of SSD.

Current study shows that the etiology of schizophrenia is multifactorial, contributed by both genetic vulnerability and environmental risk factors. This article will focus on childhood trauma and cognitive impairment, based on the framework of attachment.

2.2. Overview of Attachment Theory

In response to different patterns of care from parents, infants formed three organized (secure, dismissing, preoccupied) and one disorganized patterns of attachment to adapt. The root reason for distinctive formation of attachment styles is to maintain caregiver’s protection and attention.

Caregivers who are sensitive to infant’s need for emotional regulation and exploration provides a basis for the formation of secure attachment. This attachment type’s characteristic is emotional closeness and autonomy in interpersonal relationship, with high mentalization level. They can comfortably seek help and support from others.

In contrast, caregivers’ consistent rejection to infants’ need will raise dismissing attachment as adaption, with a focus on exploration and coping with distressful event alone instead of seeking for attachment. People with this pattern value achievement over close relationships, keeping distance

from others. They tend to view themselves as self-sufficient, regardless others' response or even abandonment.

Another insecure attachment orientation, preoccupied (anxious) attachment, is resulted from the inconsistent responsiveness and attention from caregiver. This mode leads to an under-regulated emotion, with anger or anxiety in positive emotion. They exaggerate their emotional expression in order to attract attention and security, while explores and autonomous less. In addition, they depend others for self-worthiness and acceptance.

Differed from the 3 organized orientation, individuals suffered from severe adverse childhood experiences like frightening behaviors developed disorganized attachment, including combination of other types or momentary rupture pattern.

3. Narrative of the Relationship in Cognitive and Interpersonal Model

3.1. Distribution of Attachment Types in Psychosis

Some researches argued that insecure attachment combined as a single category versus secure attachment, links to positive and negative symptoms [2]. Young onset and longer psychiatric hospitalization are also related [3]. Insecure attachment is a meaningful predictor of symptoms and interpersonal problems in every stage of schizophrenia, but more detailed categorization is needed to discover the root mechanism.

Berry et al narrated attachment theory as interpersonal framework to learn schizophrenia [2], this model is enriched by Sitko et al [4]. Moreover, Harder provides a model explaining underlying mechanism behind the relationship [5]. Most of these studies provide evidence for the significant role of avoidant and disorganized attachment, while differed in anxious attachment.

According to Harder, dismissing is found to be the most familiar attachment orientation among psychosis patients, ranged from 48% to 71% (27% in normal population) [5]. In comparison, secure attachment which accounted for 58% in normal group only occupied 27%-32% in psychosis. Anxious attachment ranged between 12% and 20% in clinical group, and accounted for 19% in normal group. Disorganized attachment is less included in previous study, only reported 29%-35% in BPD and 57% in PTSD [6]. In conclusion, dismissing and disorganized attachment is tested to be significant in psychosis while preoccupied attachment's role is questioned.

3.2. Risk Factors in Attachment Avoidance

Dismissing attachment serves as an important predictor of schizophrenia, as it links to positive symptoms, negative symptoms and paranoia [2], as well as difficulty of therapeutic relationship and other interpersonal problems which restrict recovery and prolong the course [7]. On the other hand, dismissing attachment mediates childhood trauma and schizophrenia symptoms. According to Sitko et al, avoidant attachment also serves as the mediator between neglect in childhood and paranoia in specific [4]. In another comparison research between schizophrenia patients and normal people, attachment avoidance significantly links to both positive and negative symptoms in schizophrenia [3]. Dismissing attachment itself servers as a risk factor that increases the risk proportion of schizophrenia symptoms.

Harder underlying deactivation of affects, impaired mentalization and externalizing strategies as the risk mechanism of dismissing attachment for schizophrenia [5]. The over-deactivated emotions lead to potential distress, resulted in anhedonia, asociality and emotional withdraw. Mentalization and metacognition impairment also restrict unprompted social engagement, serves as risks of negative symptoms. On the other hand, externalizing strategies lead to delusion and associated with hallucinations in youth [8].

In addition, dismissing attachment restricts recovery of schizophrenia. According to Berry et al, attachment avoidance generally leads to difficulty in relationship with therapists, due to patterned hostility towards others [2]. Another comparative research between schizophrenia and HIV/AIDS patients indicated that avoidant patients have higher level of hopelessness [7] although the proportion of avoidance was found the same in the two groups.

3.3. Risk Factors in Disorganized Attachment

Disorganized attachment is less included in previous study, the possible reason is that the assessment used are self-reported and less likely to produce disorganized attachment without assignment of post traumatic experience, including overt like childhood sexual abuse and hidden ones like severely unavailable caregiver and interaction imbalance. Ponizovsky et al argued that ambivalent attachment is related to positive syndrome of schizophrenia [3]. Fearful attachment also mediates the relationship between childhood trauma and schizophrenia-typed and psychotic-like experiences [9].

Harder hypothesized that heightened stress-sensitivity and dissociation are fundamental mechanism for relationship between disorganized attachment [5]. Both cortisol excitatory and inhibitory reactivity in schizophrenia have been found abnormal in psychosis, as the release mode altered. In addition, dissociation which is a possible mechanism of mental reaction to severe trauma is also seen as development of disorganized attachment. Both the two mechanisms links to positive symptoms which are crucial in diagnosis of schizophrenia.

3.4. Risk Factors in Preoccupied Attachment

Preoccupied attachment is also related to limited aspects of schizophrenia, although the relationship is denied by several researches. According to Chatzioannidis et al, attachment anxiety mediates childhood trauma and schizophrenia as the only factor [10]. Ponizovsky et al also indicated that anxious attachment relates to positive syndrome of schizophrenia [3]. Berry et al found a significant correlation between attachment anxiety and variation of hallucinations as well as total symptom scores [2]. Anxious attachment also serves as the only mediator between rape experiences and hallucination [4], and mediates the relationship between neglect and paranoia as well. Chatzioannidis et al also support the relationship between preoccupied attachment and hallucination [10].

Schizophrenia patients with preoccupied attachment orientation are likely to increase interpersonal difficulties due to enhanced attention on emotional distress [2]. Their inconsistency and over-activation of emotion may lead to harder start and potential collapse of therapeutic relationship. According to Ringer et al, anxiety attachment is related to low self-esteem, which restrict the re-socialization of schizophrenia patients during recovery [7].

4. Other Framework Explaining Schizophrenia and Links with Attachment

4.1. Other Frameworks

Among the previous study concerning relationship between attachment and schizophrenia, insecure avoidant and unresolved attachment orientation serve as significant predictors for schizophrenia. Whereas the explanation of the development of attachment orientations are multiple and complex, so is the onset of schizophrenia. Author hypothesized that attachment could influence schizophrenia in more wide range of aspects.

Apart from childhood adversities and trauma, more environmental factors of schizophrenia discussed by Stilo and Murray link with insecure attachment [11]. Vrtička and Vuilleumier's cognitive model of attachment styles could also be applied to analyses of schizophrenia motivations

[12]. The same study also summarized some neuroscience findings of insecure attachment abnormalities, which are consistent with schizophrenia hypothesis [13].

4.2. Multifactorial Environmental Contribution to Schizophrenia

Schizophrenia spectrum disorder is narrated as a multifactorial mental disease, genetic vulnerability interacts with environmental factors and contributes to the onset of the disease. This paragraph will focus on environmental factors of schizophrenia only and the interaction between other environmental factors and attachment. The author hypothesizes that insecure attachment mediates the relationship between schizophrenia and several environmental risk factors, including migration, parental age and social class.

According to Stilo and Murray's literature review on non-genetic factors in schizophrenia, pregnancy & birth complications, high parental age, traumatic and social adversities, social class and isolation, migration, urbanicity, cannabis and other substance use, cognitive impairment, and brain structural abnormalities serve as significant environmental risk factors [11]. Apart from childhood adversities which serve as key factor for attachment and schizophrenia, parental age, social class, migration may also serve as risk factors of insecure attachment.

Migration serves as a risk factor of onset of schizophrenia, vary by country of origin. Stilo and Murray argued that potential social adversities included in migration like social isolation, discrimination, lack of private accommodation and economic opportunities contributes to the increased risk of schizophrenia [11]. On the other hand, a meta-analysis suggests that deprivation of material and parental warmth also increases attachment avoidant in male and anxiety in both genders [14]. It could be hypothesized that the insecure attachment relationship between migraters and new caregivers or other important social alliance serve as significant mediators of this relationship. In addition, previous-occurred insecure attachment orientations may also be reasons for social isolation and opportunities lost. The possible order may be that the pre-existed dismissing attachment mode is enhanced by social adversities met after migration, and finally lead to onset of schizophrenia.

34 and above parental age serve as risk factor of schizophrenia [11], while risk mother age is either lower than 19 or higher than 40 [15]. Advanced father's role in schizophrenia is explained by personality attributes while advanced mother age is more related to prenatal disease risks. Dismissing attachment orientation is likely to increase with age, especially for low class male. Parents with advanced ages are more likely to avoid attachment consistently with their children, causing permanent unresponsiveness to children's emotional needs which is the key to dismissing attachment. In addition, dismissing attachment is accounted for 42% in adolescent parents [14], suggesting a similar mode of dismissing attachment formation. Attachment anxiety is also more frequent in young parents, with inconsistent responsiveness. Another possible outcome disorganized attachment which serves as an extreme outcome of emotional abuse in childhood may lead to borderline personality disorder. This mental disease also includes delusions and paranoia and frequently comorbid with schizophrenia [16]. Both BPD and schizophrenia could be possible outcome of long-term denial of attachment need and unresponsiveness. Dismissing attachment caused by parents with insecure attachment orientations serves as an important mediator between advanced or low parental age and schizophrenia.

Although there is no direct evidence for the relationship between social class and attachment orientation development. Deprivation of material serves as important predictor of attachment anxiety in females and males, as well as attachment avoidance in males [14]. An important scale of social class of a family is the father's income, while low income could predict insecure attachment in males. The deprivation of material, which links to low SES, may also be the reason of developmental diseases like pathogenesis in neurodevelopment caused by malnutrition. Abnormal neurodevelopment interacts with emotional adversities, coherently serves as risk factors of

schizophrenia. Long-term material difficulty and emotional adversity explain a possible pattern how material deprivation in low SES family produces more schizophrenia patients.

4.3. Cognitive-emotion Model of Attachment, Applied to Schizophrenia Etiology

Apart from the guidance to interpersonal relationship, the primary interaction in development is also crucial in cognitive patterns formation. Vrtička and Vuilleumier provides cognitive model based on neuroscience findings, explaining insecure attachment orientations as abnormalities in emotion processing, selective attention and memory [12]. Some of the abnormal patterns in dismissing and preoccupied attachment are similar with the cognitive deficits in schizophrenia. Based on this insight, schizophrenia patients' disorganized speech, emotion and thinking could be understood in a new perspective.

Vrtička and Vuilleumier focused on the comparison between secure attachment and the two resolved insecure attachment (dismissing and preoccupied) [12]. Based on the emotion processing perspective, dismissing attachment individuals are less likely to be aroused by positive emotions, and thus form a dismissal of positive interactions. This could lead to negative symptoms of schizophrenia like asociality and persisted depressed mood. On the other hand, preoccupied attachment links with an enhanced response and decreased control towards negative social scenarios [12]. Concerning insecure attachment all link with quicker onset and offset of emotional expression, preoccupied attachment individuals are likely to form inappropriate affect.

On the other hand, selective attention is also the reason for the link between the cognitive-behavioral pattern of insecure attachment and disorganized speech. Attachment anxiety enhance a process of attachment-related information and bias towards attachment-related names [12]. All insecure attachment individuals like to orientate away their attention from negative-related words at once, this reflects a strategy in response to the fear of negative attachment-related words, although under threaten or distress situation, attachment anxiety will enhance this fear. It could be summarized that either the ignorance or the over-focus of attachment-related information would lead to an incomplete processing of input context. A similar cognitive abnormality is found in schizophrenia patients that they hard to provide cohesive narratives. Under this consistency, it could be hypothesized that this impairment may be caused by sensory input and attention instead of working memory. Attachment anxiety may serve as one of the reasons for disorganized speech which is a cognitive symptom of schizophrenia. In addition, the avoidance of attachment-related information would explain inconsistent thinking.

Besides, attachment avoidant links with more memory bias [12]. For instance, negative emotion like anger is better memorized, while other attachment-related stimuli are less memorized. Concerning insecure attachment's worse performance in recalling threaten words that may occur in many childhood adversity scenarios [12], it could be hypothesized that insecure avoidance mediates relationship between childhood adversity and memory deficit in schizophrenia. In addition, deficit in recalling threaten words may cause children less likely to validly report abuse from strangers to their caregivers and receive appease, forming persecutive delusion instead.

4.4. Neuroscience Model of Attachment and Schizophrenia

Neuroscience serves as an important model explaining the mechanism of schizophrenia, focusing on genetic convergence, cortical excitatory-inhibitory imbalance and subcortical dopamine dysfunction [13]. In comparison, attachment theory is less discussed in neuroscience domain. Vrtička and Vuilleumier's cognitive and biochemical model link insecure attachment orientations with modulation between affective evaluation and cognitive control [12]. The rewarding mechanism dysfunction mentioned in both models provide possibility to link the two together. It is surprised to

find that there are several similarities between the two. Based on those similarity evidence in biochemical studies, neuroscience could be another framework to explain the relationship. The whole group are vulnerable to schizophrenia due to biological and cognitive deficits that developed before the onset of psychosis, and the possible reason could be tracked to insecure attachment caused by childhood adversity.

The most significant connection between the two is the striatum functions that construct rewarding mechanism. According to Vrtička and Vuilleumier, insecure avoidance links with weaker activation of reward circuit, evidenced from suppressed striatum activities and less medial OFC activity [12]. This deficit is observed in dismissing attachment individuals when they receive positive social feedback and their similar response in positive and negative scenarios. On the other hand, deficit in mesostriatal dopamine could lead to delusion in schizophrenia [13]. Striatal dopamine synthesis disruption during prodromal phase significantly predicts severe syndromes of schizophrenia onset.

This disruption in reward circuit could also be explained as a desensitization or down-regulation of rewards due to past experience, resulted in learning mechanism dysfunction. This strategy in the explanation of dismissing attachment is basically to avoid recruitment state of attachment system, and thus, leads to a positive reinforcement failure. This learning failure is referenced as the dopamine neurons disruption or “reward prediction error signal” [17]. On the other hand, dopamine neurons also involved in updating of beliefs that shape beliefs of the world. In specific, early adversity may lead to persecutory cognitive biases that negative events are caused by others’ hostile acts [13]. This tendency is consistent with that of dismissing attachment individuals who like to externalize and evaluate others negatively. This negative-oriented cognitive bias finally develops into persecutory delusions in onset of schizophrenia. In this way, dopamine-related reward circuit dysfunction explains the relationship between insecure avoidance and schizophrenia.

There are other similarities in biological evidences that still not be explained in details, but further research could investigate further about the potential relationship. For instance, there is a widely recognized mechanism that synaptic pruning abnormality leads to a higher amount of gray matter loss in adolescence and finally result in cognitive deficit [13]. In addition, smaller gray matter volume is also found in insecure attachment groups [12]. On the other hand, schizophrenia patients’ stress-response circuitry abnormality including amygdala and frontal cortex is explained as sensitization of subcortical dopamine system [13]. These brain parts are also included in social aversion system at being enhanced by dismissing attachment and suppressed by preoccupied attachment, concerning aversive stimuli is also encoded by dopamine neurons [12].

5. Discussion

Previous study explains insecure attachment orientations as both predictors of schizophrenia and mediators between childhood trauma and schizophrenia. Dismissing attachment links with positive syndromes, negative syndromes, paranoia and difficult therapeutic relationship [2,3,4,7,8], while preoccupied attachment links with positive symptoms (hallucination emphasized) and potential collapse of therapeutic alliance [2-4]. In addition, dismissing attachment mediates childhood trauma and schizophrenia symptoms while preoccupied attachment mediates rape and hallucination as well as neglect and paranoia [7,8,10]. Disorganized attachment links with positive syndromes and mediates trauma and psychotic experience [3,9]. The underlying mechanism of avoidance is deactivation of affects, impaired mentalization, externalizing strategies while disorganized relates to heightened stress-sensitivity and dissociation [5].

This article, on the other hand, argue that insecure attachment mediates more environmental risk factors and schizophrenia, including migration, social class and abnormal parental age. Material deprivation caused by migration and low SES links with dismissing and preoccupied attachment [14], which could be mediators of the relationship between the environmental factors and schizophrenia.

Extreme poverty could also link with malnutrition during prenatal stages, affecting neurogenesis. On the other hand, both low (19-) and high (40+) could increase the risks of dismissing attachment, and the permanent attachment avoidance could be potential reason for childhood emotional adversity [14]. The insecure attachment resulted from insecure attachment could be possible reason for high and low parental ages' link with schizophrenia and borderline personality disorder. This mechanism could arise another concern that which one serves as the real mediator among the relationship of childhood adversity, dismissing attachment, and onset of schizophrenia.

In addition, this article provides evidence for the underlying mechanism of the relationship between dismissing, disorganized attachment and schizophrenia. For instance, dismissing attachment is less likely to be aroused by positive social cues in emotional processing domain, which provides evidence for deactivation of affect's role as risk factor of schizophrenia [12]. Moreover, preoccupied attachment individuals are more likely to be aroused by negative social cues [12]. This could negatively influence the self-insight during schizophrenia and the same enhanced sensitivity towards distress is also narrated as mechanism underlying disorganized attachment. It could be hypothesized that this sensitivity also mediates attachment anxiety and schizophrenia. Another evidence for preoccupied attachment is the enhanced attention on attachment-related words [12]. This focus could lead to an ignorance of coherence during recall. The same cognitive deficit is also observed in schizophrenia patients with disorganized speech [13]. This cognitive deficit is normally linked with memory dysfunction, but it could be questioned that this deficit is more related with attention and perception bias. In comparison, memory dysfunction is found in dismissing attachment individuals, this could link to a less valid report of childhood adversity to their caregiver [14]. In long-term, learned helplessness caused by repetitive communication failure may decrease attachment recruitment tendency and finally lead to asociality as well as worse therapeutic alliance. The author hypothesize that memory deficit could be another underlying mechanism for dismissing attachment.

Among the subcortical dopamine dysregulation theme on neuroscience research of psychosis, rewarding circuit abnormality could be the mechanism explaining the relationship between dismissing attachment and schizophrenia. The abnormal striatal dopamine synthesis could predict both attachment avoidance and schizophrenia [13]. The desensitization of reward circuit explaining persecutory delusion as a cognitive bias aroused by childhood adversity and negative cognition. This tendency is consistent with the negative belief towards others in dismissing attachment as well. This finding also serves as evidence for impaired mentalization as underlying strategy of dismissing attachment's role in schizophrenia positive symptoms [5]. In addition, the abnormality in amygdala and frontal cortex is also found in both dismissing attachment individuals and schizophrenia patients. These two brain areas link with social aversive stimuli, which is also encoded by dopamine neurons [13]. The causal relationship between the two could be further investigated. Another evidence for this the gray matter loss in schizophrenia which serves as evidence for synaptic pruning [13]. Gray matter is also lower in all insecure attachment groups [12]. What have to mention here is that the synaptic pruning process happen in adolescence stage which is later than attachment formation. It could be hypothesized that insecure attachment serves as the key reason for neurodevelopment abnormality in schizophrenia and predict prodromal stage in schizophrenia. This relationship could also be investigated further.

A potential weakness of this article is that most of the relationships that the author reported are not supported by direct evidence. Some of the relationship may be too far-fetched. The relationship between schizophrenia and environmental risk factors are more complex than we expected. There may be more mediators that the author did not mention. A more complex model serves as the underlying mechanism for the onset of schizophrenia. Further research is required to provide evidence for those hypotheses mentioned in this article. Another weakness may be the poor neuroscience evidence. The neuroscience research of attachment is still in the first stage and more related to

cognitive-behavioral model. Further research of attachment-related mechanism is needed to provide molecular and neurotransmitter facts for insecure attachment orientations.

6. Conclusions

Overall, insecure attachment orientations that developed in childhood plays a more significant role in the onset and development of schizophrenia, restricting recovery. Dismissing attachment links with delusions, asociality, diminished emotion expression, paranoia, and disorganized speech in schizophrenia. The underlying mechanism includes externalizing strategies, deactivation of affects, impaired mentalization, and memory& perception deficits, evidenced from dysfunctional working memory and reward circuit. Preoccupied attachment is related to hallucination, disorganized speech, inconsistent thinking, and interpersonal relations, evidenced from selective attention abnormality, emotion processing dysfunction, dopamine synthesis and aversive arousal abnormality. Disorganized attachment also links with positive syndromes, grossly disorganized and catatonic behaviors, and emotional inconsistency.

Besides childhood traumatic experience, dismissing attachment also relates to migration, SES, and adolescent/advanced parents. Attachment avoidance mediates the relationship between these environmental risk factors and onset of schizophrenia. On the other hand, these environmental factors may also contribute to the establishment of insecure avoidance. Significant cognitive mechanism that included in these relationships includes the modulation between cognitive representation and affective evaluation, negative belief bias towards others, and desensitization of reward circuit.

This article provides a potential orientation of future studies, the molecular and neurotransmitter mechanism of attachment could be further investigated. In addition, the relationship between social adversities and attachment could be focuses, investigating the mediator effect of both the risk factors. In addition, there are still more vacancies to fulfill in the cognitive model in schizophrenia. The communication and linguistic difficulties may serve as crucial factors. On the other hand, this article focus on the environmental factors interaction part as the explanation of schizophrenia onset. Genetic vulnerability also plays an important role in this mechanism. The genetic vulnerability of insecure attachment could be investigated further in the future study. Clinically, the secure attachment providing may be significant in the treatment of schizophrenia. The therapeutic alliance establishment should be emphasized as key factor for schizophrenia treatment.

In conclusion, interpersonal factor, attachment theory could be an important perspective to understand etiology and treatment of schizophrenia. There is still a more complex mechanism behind the onset and development of schizophrenia and insecure attachment.

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