

Chapter 4

Attachment relationships of preschool aged children of mothers with HIV and HIV-related psychosis

Spies, R., Sterkenburg, P.S., Schuengel, C., & Van Rensburg, E.

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Abstract

Children from mothers with HIV related psychosis are frequently raised in challenging contexts, yet the extent to which these children grow up in insecure or disordered attachment relationships is unknown. Using the Strange Situation Procedure the distribution of attachment relationships of children from mothers with HIV and psychosis ($n = 45$) was compared with children from mothers with HIV without psychosis ($n = 41$). No significant differences in the distributions were found between the two groups and attachment was not associated with specific psychotic symptomatology. Security of attachment was associated with more people providing the mother with emotional support, but only in the psychosis group. Disordered attachment (24%) was more often found in the total sample than in studies with normal and high risk populations. Recommendations were made for future research about factors facilitating resilience in the children and on interventions increasing emotional support for affected mothers.

Parenting while having a diagnosis of both HIV and a psychotic disorder has never been empirically studied. In particular, studies are lacking on the attachment relationships of mother-child dyads living in this situation (Spies, Sterkenburg, Schuengel & Van Rensburg, 2013). Literature reporting on the attachment relationship where the mother has either HIV or psychosis alone is also limited. Two independent systematic literature reviews on child attachment and maternal psychotic disorders by Spies and colleagues (2013) and Wan and Green (2009) found only two studies, both from the 1980s. D'Angelo (1986) and Näslund, Persson-Blennow, McNeil, Kaij, and Malmquist-Larsson (1984) both compared the attachment relationships of infants of mothers with non-organic psychosis to demographically similar unaffected dyads using the strange situation procedure. A significant elevation in insecure attachment in the psychosis groups was reported in both studies. D'Angelo (1986) reported more specifically, that anxious-avoidant attachment was significantly higher in the psychosis group. As Main and Solomon (1986) proposed the category of disorganized attachment in 1986, the disorganized pattern was not taken into consideration. It would thus be important to study the possible association between attachment and psychotic symptomatology with the current knowledge of attachment theory.

Studies focusing on HIV and attachment are mostly focused on attachment styles of adults with HIV (Feeney & Raphael, 1992; Koopman et al., 2000) or the attachment relationships of HIV-positive children (Dobrova-Krol, Bakermans-Kranenburg, Van IJzendoorn, & Juffer, 2010). Only one study could be found on mother-infant attachment relationships where the mothers were HIV positive. Using the Waters Attachment Q-set, Peterson (1994) found no significant difference between the attachment quality of infants with mothers who were HIV-positive versus HIV-negative. A distinction was made, however, between HIV-positive healthy mothers and those who were diagnosed with Aids. Significantly fewer infants had secure attachment relationships with their mothers in the Aids group compared to the HIV-positive healthy group. These findings underscore the importance of distinguishing between the complex risk factors and challenges that HIV-positive mothers and their children have to deal with.

Main and Hesse (1990) were the first to investigate the ontogeny of disorganized attachment and they suggested that the caregiver's unresolved mourning at the loss of a significant other, brought about frightened or frightening behaviour. This behaviour created an incomprehensible situation for the infant, leading to the display of disoriented and disorganized patterns of behaviour. Lyons-Ruth and Block (1996) expanded on this theory, including atypical behaviour from the mother as a causative factor for disorganization. The associations between unresolved states of mind, anomalous or atypical parental behaviour and disorganized attachment in infants were confirmed in the meta-analysis of Madigan and colleagues (2006). In a mixed methods study that included an investigation of the parenting experiences of mothers with HIV and psychosis, themes were identified that can be perceived as frightening maternal behaviour (Spies, Sterkenburg, Van Rensburg & Schuengel, 2015) and thus may be linked to disorganization. Disorganized attachment predicts a number of pathological outcomes for the child, but in particular externalizing problems such as antisocial- and aggressive behaviours (Groh, Roisman, Van IJzendoorn, Bakermans-Kranenburg, & Fearon, 2012). If disorganization is higher in the sample from our study, the child may be at heightened psychosocial risk because of that.

The prevalence of HIV related psychosis is estimated to be between 0.2% and 15% of people who are HIV-positive (Alvarez-Segura, Villero, Mayoral, Montilla & Fraguas 2008; Dolder, Patterson & Jeste, 2004). In a country such as South Africa with a high number of people living with HIV, who are also exposed to poverty and other socio-economic risks, the phenomenon is of particular concern. Parenting in this context may imply added demands for women who are already deprived of physical and emotional resources. The mixed methods study by Spies and colleagues (2015) found that South African mothers with HIV and psychosis reported a number of challenges with regards to mothering that included not being able to care for their children's basic needs, rejecting the child because of a preoccupation with illness symptoms and at times even becoming aggressive towards their children without provocation. It was reported that children reacted with fear and avoidance towards their mothers. These are all behaviours indicative of atypical and insensitive caregiving. The meta-analysis of Van der Voort, Juffer, and Bakermans-Kranenburg (2014) found evidence from multiple studies

that supported the links between parenting sensitivity, secure attachment relationships and healthy social-emotional development of the child. When sensitive parenting is absent it may result in attachment insecurity and pathological development in the child.

A meta-analytic study by Cyr, Euser, Bakermans-Kranenburg, and Van IJzendoorn (2010) identified seven socio-economic risk factors that significantly predict insecure and disorganized attachment. These are substance abuse, being part of a minority group, being an adolescent mother, low education, low income, single parenthood, and maltreatment. An accumulation of at least five of the first six risk factors was as strongly predictive of disorganized attachment as maltreatment. It is therefore important to investigate the possible links between attachment and the parenting contexts of children of mothers with HIV and psychosis when possible confounding variables are accounted for such as socio-economic stressors.

In the study by Spies and colleagues (2015) the mothers emphasized the value of support figures in their lives. They reported that these support figures at times completely took over their caregiving responsibilities when they were incapable of looking after their children. They emphasized the importance of family support in times of their illness. Dolman, Jones, and Howard (2013) also reported on the importance of the support network for women with schizophrenia where the women reported that support alleviated some of the demands during times of illness. Social support and in particular emotional support was found to be a predictor of quality of life for people diagnosed with psychosis in a study by Caron, Lecomte, Stip, and Renaud (2005). With increased emotional support and quality of life, women with psychosis may be more empowered in being mothers as well. Emotional support is valued in these studies and may need further investigation. This can be done by measuring the possible moderating effects between psychosis and parenting and in particular the attachment relationship.

The first aim of this study was to contrast the distribution of attachment patterns of preschool-aged children from a group of mothers with HIV with a group of mothers with HIV and psychosis. Secondly, possible associations between attachment status and socio-economic risks were

investigated. Thirdly, the possible role of emotional support as a moderator for the attachment relationships of this sample was investigated. Fourthly, the distribution of attachment classifications from the sample in this study was compared to other studies of children with comparable ages from normal as well as at risk samples.

It was hypothesized that both groups had a high rate of insecurity and disorganization, but that especially disorganization was more prevalent in the group of children with mothers who had an additional diagnosis of a psychotic disorder. Secondly, it was expected that higher numbers of socio-economic risk factors were associated with more insecure and disordered attachment. Thirdly, it was hypothesized that more emotional support predicted more secure attachment relationships for the mothers with HIV, but may be even more important for children of mothers with HIV-related psychosis. Fourthly, it was expected that insecurity and disorganization were higher in this high risk sample compared to normal samples and possibly also compared to other high risk samples.

Methods

Participants

Researchers identified three hospitals and seven clinics from the North-West-, Gauteng- and Kwa-Zulu Natal provinces of South Africa who provided specialized treatment of people with HIV and psychiatric illnesses. Participants were included if they were mothers of a child between the ages of 2 and 9 years and had a diagnosis of HIV or HIV and a psychotic illness. Only mothers who were treated as outpatients, thus not staying in hospital, were included. To prevent risk to the children, mothers with acute psychotic symptoms were not included in the study. The length of time that the children were exposed to mothers who were experiencing psychotic symptoms was unknown. The case group included 45 mothers with HIV and psychosis, ranging between 20 and 49 years old ($M = 33.4$, $SD = 6.4$) and their children aged between 2 and 9 years old ($M = 5.1$, $SD = 2$). The comparison group included 41 mothers with HIV and no psychosis, ranging between 22 and 46 years old ($M = 33.5$, $SD = 6.4$) and their children aged between 2 and 9 years old ($M = 4.9$, $SD = 2$).

All the participants lived in under-resourced, peri-urban settings (townships) and reported a high number of socio-economic and maltreatment risk indicators for attachment insecurity and disorganisation as identified by Cyr and colleagues (2010). These were low incomes (94% indicated financial difficulties and at times not having food in their homes), low education (23% completed school and 19% only had primary level education), maltreatment of their children (75.6%), and all were part of a minority group (see Table 1).

The North-West University Ethics Committee granted ethical approval for this study, registered under NWU-00046-12-A1. Additionally, the Departments of Health of Gauteng-, North-West- and KwaZulu Natal provinces approved the collection of data from participating health care facilities. Written informed consent was received from the mothers for participation for themselves as well as their children. Researchers followed the rules of ethical conduct of the Health Professions Council of South Africa and American Psychological Association.

Table 1 *Demographic characteristics of mothers in the sample (N = 86)*

Categories	HIV mothers without psychosis	HIV mothers with psychosis	Total sample
Mother's age (<i>M, SD</i>)	33.49 (6.38)	33.47 (6.36)	33.48 (6.33)
Child's age (<i>M, SD</i>)	4.93 (1.85)	5.11 (1.96)	5.02 (1.9)
Number of siblings (<i>M, SD</i>)	1.34 (1.26)	1.48 (1.02)	1.4 (1.1)
<i>Highest level of education (n,%)</i>			
≤ Primary completed	9 (22)	7 (16)	16 (19)

Some secondary completed	24 (59)	26 (58)	50 (58)
≥Secondary completed	8 (20)	12 (27)	20 (24)
Employed mothers (<i>n</i> , %)	12 (30)	4 (15)	16 (18)
<i>Town (n, %)</i>			
Potchefstroom	39 (95)	9 (21)	48 (57)
Klerksdorp	0 (0)	2 (5)	2 (2)
Stilfontein	1 (2)	5 (11)	6 (7)
Newcastle	0 (0)	1 (2)	1 (1)
Johannesburg	0 (0)	26 (59)	26 (31)
other	1 (2)	1 (2)	2 (2)
Single parent (<i>n</i> , %)	24 (59)	39 (87)	63 (73)
Financial problems (<i>n</i> , %)	39 (95)	42 (93)	81 (94)
Financial support from father (<i>n</i> , %)	18 (44)	10 (23)	28 (33)
<i>Attachment risk factors (Cyr et al., 2010) (n, %)</i>			
Low income	41 (100)	44 (98)	85 (99)
Single mother	24 (59)	40 (89)	64 (74)
Low education	33 (81)	34 (76)	67 (78)
Adolescent mother	1 (2)	2 (4)	3 (4)
Minority	41 (100)	45 (100)	86 (100)
Substance abuse	20 (49)	19 (42)	39 (45)
Maltreatment	30 (73)	35 (78)	65 (76)

M = mean, SD = standard deviation, n = number and % = percentage

Measure

Attachment assessment

Quality of attachment relationships between mothers and children was assessed with the Strange Situation Procedure (SSP) (Ainsworth, Blehar, Waters & Wall, 1978) and coded with the MacArthur Preschool Attachment Classification System (Cassidy & Marvin, 1992). The SSP entails a series of episodes where children are separated and reunited from their attachment figure and a stranger. The procedure is designed to encourage natural interaction between attachment figures and children with the occasional introduction of mildly anxiety provoking situations (i.e. separations) that will enable the trained observer to witness a range of attachment- and exploration related child behaviours. These patterns of behaviour are classified in one of five possible attachment categories. These are: secure, insecure-ambivalent, insecure-avoidant, controlling-disorganized and insecure other. Children with secure attachment relationships will actively seek proximity and they are easily comforted upon reunion with the caregiver. Insecure-ambivalent children will seek proximity to the caregiver upon reunion, but also resist it and they experience little security in the caregiver's presence. Children with insecure-avoidant attachment classifications may actively avoid or ignore the caregiver or maintain emotional neutrality during reunions. The controlling disorganized group is characterised by a strategy of controlling the caregiver during reunions in either a caregiving or punitive manner. Children classified as insecure other form part of a disordered group together with children classified as controlling-disorganized (Cassidy & Marvin, 1992).

Procedures

Nursing staff from the health care facilities invited a total of 227 mothers who met the inclusion criteria for participation. The first author telephoned the mothers who agreed to be contacted and after research procedures were explained, 86 consenting mothers were included in the study. To respect autonomy and prevent coercion, mothers were not asked to give a reason for declining participation.

Participants knew their HIV status prior to data collection and received pre- and post-test counselling at the health care facilities. The diagnosis was made at the hospitals when a reactive rapid test and an Enzyme Linked Immunosorbent Assay (ELISA) or confirmatory rapid tested positive. All participants had also been seen by a multidisciplinary team that included at least a clinical psychologist, psychiatrist and nursing staff, who made a diagnosis of psychosis based on observed criteria of the DSM-IV-TR (APA, 2000). Data collection took place from May 2012 until July 2013.

In cases where the mother was not fluent in English, interpreters facilitated the communication. Interpreters were students who studied African languages at the North-West University in South Africa (NWU) and whose first language was Zulu, Tswana or Sotho. Participants received a R100 gift card (€7) and they were provided with transportation and a meal.

The settings for the data collection were observation rooms with video recording facilities at the NWU in Potchefstroom and Chris Hani Baragwanath Hospital (CHBH) in Johannesburg that were converted into playrooms for the SSP. Upon arrival at the venue for data collection, participants were again informed about confidentiality, the voluntary nature of participation and given the opportunity to ask questions. Demographic information was retrieved in interview format.

Following completion of the questionnaires, the Strange Situation Procedure was performed. Female research assistants who were post-graduate students from the NWU and VU University Amsterdam or colleagues of the first author were the strangers as they were unfamiliar to the child. All strangers received training and signed confidentiality contracts with the first author to protect the identities of participants. The procedure that was followed for the strange situation procedure as well as the instructions given to the strangers came from the training manual of Cassidy and Marvin (1992).

A professional videographer recorded videos at NWU and the first author did the recordings at CHBH. Video recordings were translated to English and subtitles were generated for the videos. Two independent, certified coders who were blind to the samples and objectives of the study coded the attachment classifications. Professor R.S. Marvin from The Mary D. Ainsworth Child-Parent

Attachment Clinic trained the coders. Both the coders had additional experience in the infant-classification system of the SSP. Ten of the 86 videos were coded by both coders. Inter-rater reliability for the coding of the attachment classifications was Cohen's Kappa = .71. Discrepancies were found in two of the videos and in this instance a third certified independent coder coded the videos. In both cases there was a match, so where two of the three coders agreed upon the classification, this classification was used. The coders' notes of the SSPs were also examined to verify that they were observing similar behaviour that related to the specific attachment classification.

Analysis

Analysis of the data was performed using SPSS version 22. To compare the distribution of attachment of the two groups (HIV with or without psychosis), chi-square tests for independence were conducted. Binary logistic regression analysis was used to determine whether group (case versus comparison) predicted security or insecurity and organization or disordering of attachment. A sequential logistic regression analysis was used to investigate the possible effect of covariates and moderating variables on group and attachment classification. For a comparison of the distribution of attachment of our sample with those of other studies, the Multinom programme (Kroonenberg, 1998) was used to test the deviation of the distribution from the standard distribution. Standardized residuals of $> \pm 2$ were considered significantly larger or smaller than expected marginals.

Results

Preliminary analysis

Demographic variables were compared between the two groups, HIV with and without psychosis in order to identify potential confounding variables. There were no significant differences on the demographic variables between the two groups with regards to age of the women and children, reported financial problems, alcohol and drug use of mother and father, education level of mother and father, domestic conflict and occupational status.

Attachment: HIV with and without psychosis

Distributions of attachment patterns across the case and comparison groups are displayed in Table 2. In the total sample, attachment security was observed in only 41% of the mother-child dyads, with 59% being insecurely attached. Amongst the insecure classifications, avoidant strategies were most prevalent (26%). When the role-reversed controlling and insecure-other classifications were combined as a larger disordered group as proposed by Hoffman, Marvin, Cooper and Powell (2006), 24% of the sample was classified as disordered.

Table 2: *Distribution of attachment patterns across the case and comparison groups (n; %)*

	HIV without psychosis	HIV with psychosis	Total sample
A: Insecure-avoidant	10 (24)	12 (27)	22 (26)
B: Secure	16 (39)	19 (42)	35 (44)
C: Insecure-Resistant	4 (10)	4 (9)	8 (9)
D: Role-reversed/controlling	4 (10)	2 (4)	6 (7)
IO: Insecure other	7 (17)	8 (18)	15 (17)
Disordered (D + IO)	11 (27)	10 (22)	21 (24)

A chi-square test for independence was performed to determine if psychosis was related to attachment classification (secure, insecure ambivalent, insecure avoidant and disordered). No significant association was found. In addition, the classifications of attachment were divided into participants who were classified disordered and participants who were ordered (i.e. secure, insecure avoidant or insecure ambivalent). Chi-square test was performed to determine if group (mothers with HIV and mothers with HIV related psychosis) predicted disordered attachment relationships. No significant differences were found.

Similarly two new groups were created based on security of attachment classification that included participants with secure attachment and participants with insecure attachments (i.e. insecure-avoidant, insecure-ambivalent and disordered). The Chi-square test found no statistical significance for having a diagnosis of psychosis as a predictor for attachment security.

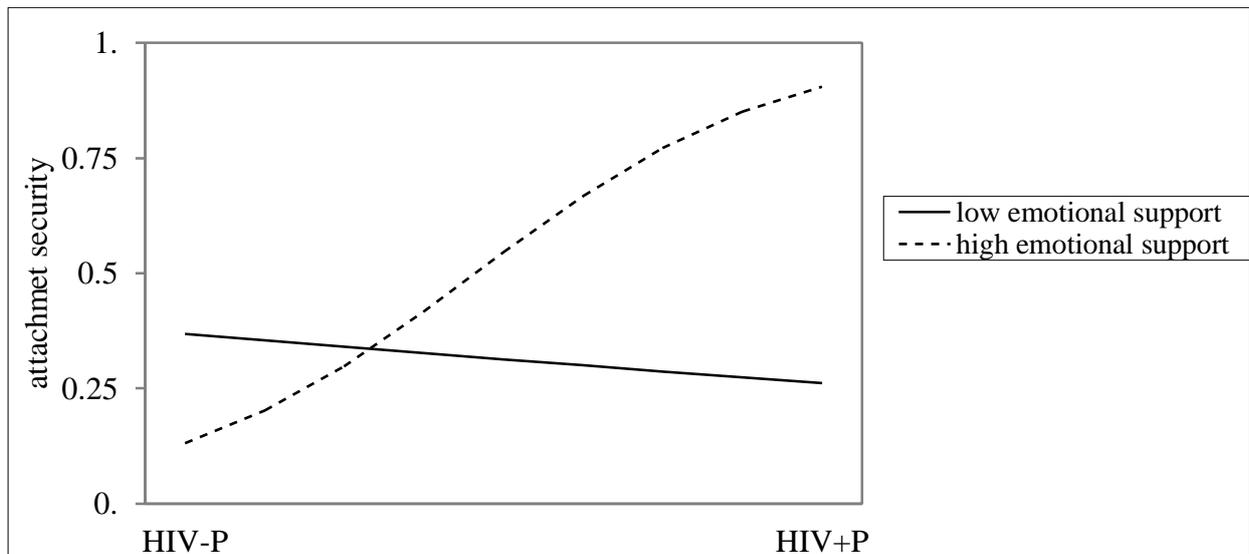
Socio-economic risks and attachment

The role of the seven socio-economic risk factors identified by Cyr and colleagues (2010) in disorganized/disordered as well as insecure attachment was investigated in this sample. Chi-square tests indicated no significant associations between presence of the individual aforementioned risks and disordered attachment. Having a diagnosis of psychosis with HIV, however was associated with single motherhood. Significantly more mothers with HIV related psychosis reported being single parents ($\chi^2(1, N = 86) = 10,381, p = .001$). When a hierarchical multiple logistic regression was performed, none of these risk factors, nor the age and gender of the child moderated the effect of having a psychotic disorder on attachment security or disordered attachment.

Emotional support and attachment

A sequential logistic regression was performed using attachment security versus insecurity as a dichotomous dependent variable. The number of family members forming part of the support network, the diagnosis of psychosis, and the number of identified support figures providing emotional support were each entered as predictor variables. This step of the analysis yielded no significant effects and the model did not have a good fit when either of the predictor variables (family members, emotional support and psychosis) was entered alone. In the next step an interaction factor consisting of having a diagnosis of psychosis in combination with the number of people providing emotional support was added. This interaction variable significantly predicted attachment security ($p = .031$) with an odds ratio [Exp (β)] of 3.14. This indicated that the odds for secure attachment were three times higher when a mother with psychosis had a high number of people providing her with emotional support compared to less people providing emotional support. Figure 1 illustrates the two-way interaction effect for the logistic regression analysis. The proportion of dyads classified with secure attachment was higher in mothers with a diagnosis of HIV and psychosis if a higher number of people provided emotional support to the mothers.

Figure 1: Proportion of attachment security by psychosis diagnosis and number of emotional supporters.



Comparison with other populations

The results from this study were compared to other studies (Table 3). Standardized residuals were computed to assess deviations with summaries of results from other populations. The meta-analysis of Van IJzendoorn, Schuengel, and Bakermans-Kranenburg (1999) grouped the results from normal USA samples of children older than 24 months. Compared to the normal samples, the distribution of attachment did not deviate significantly for secure (B), avoidant (A) or resistant (C) classifications, but significantly more participants ($Z = 2.31$) were classified as disordered (D) in the current study. A comparison was also made with studies identified in the meta-analysis of Cyr and colleagues (2010) with high risk populations and where the Cassidy and Marvin (1992) system for the SSP was used on preschool-aged children. The frequencies for each classification were calculated using the sum of the frequencies of the four identified studies (Table 3). Disordered attachment was significantly more frequent in the current study ($Z = 2.52$) and insecure resistant attachment was significantly less frequent ($Z = -1.96$). Secure and insecure avoidant patterns did not show significant differences.

Table 3: Distribution of attachment classifications compared with other studies.

Study	Frequency				Standardized Residuals			
	A	B	C	D	A	B	C	D
This study	22	35	8	21	-	-	-	-
Normal US population ≥24 months	94	275	50	73	1.37	1.89	-0.25	2.31*
<hr/> Studies from meta-analysis on high risk samples of preschoolers tested with SSP								
• Moore et al. (1997)	21	59	56	18				
• Moss, Cyr & Dubois-Comtois (2005)	37	139	29	37				
• Cicchetti & Barnett (1991)	11	11	4	10				
• Barnett, Kidwell & Leung (1998)	18	42	3	6				
Total Moore et al., Moss et al., Cicchetti & Barnett, Barnett et al.	87	251	92	71	1.83	1.23	1.96*	2.52*

* $p < .05$

Note. Comparison study sample with normal US > 24 months $\chi^2 = 10.82$, $p < .05$; Comparison study sample with at risk > 24 months $\chi^2 = 15.08$, $p < .01$

¹Van IJzendoorn, Schuengel and Bakermans-Kranenburg (1999)

²Cyr, Euser, Bakermans-Kranenburg and Van IJzendoorn (2010)

Discussion

Contrary to previous studies from D'Angelo (1986) and Näslund and colleagues (1984) on maternal psychosis, the classifications of attachment quality were comparably distributed between children with HIV-positive mothers diagnosed with a psychotic disorder versus children with HIV-positive mothers without psychosis. Psychosis on its own was therefore not a significant risk factor for insecure or disordered attachment. The expectation was that the psychosis would increase the risk for disordered attachment as Madigan and colleagues (2006) found moderate effect sizes for the associations between anomalous parental behaviour and disorganized attachment relationships. Similarly, Cyr and colleagues (2010) reported large effect sizes for the association between maltreatment and disorganized attachment relationships. Both anomalous behaviour and maltreatment were characteristic of the behaviour previously reported in our sample of mothers with HIV related psychosis (Spies et al., 2015). For example, the mothers reported being aggressive towards their children and behaving in a frightening manner when they were experiencing active symptoms of psychosis.

A possible explanation for the similarity in the distribution of attachment between the two groups (HIV with and without psychosis) was that the psychotic symptoms were under effective control. The group of mothers with HIV related psychotic disorders had confirmed diagnoses during recruitment, but received antipsychotic treatment. Consequently their symptoms were in remission when data collection took place. Recruitment was done among treated mothers, as potential exposure of the child during the SPP to the mothers' acute psychotic symptoms would be unethical. The length of time and severity of the children's exposure to the mothers' psychotic behaviour before the problems were detected and treated were unknown, making it impossible to establish whether a longer history of exposure to maternal psychotic symptoms may have increased the risk of insecure or disordered attachment.

The effects of exposure to maternal psychotic symptoms may also have been overshadowed by the large number of other risk factors that these families experienced. Focusing on the risk factors

linked by Cyr and colleagues (2010) to disorganized attachment, both groups of mothers reported high numbers of serious risk factors, which was consistent with the elevated percentage of disordered attachment classifications, even when compared to other at risk populations (Cyr et al., 2010). If maternal psychosis had any effects, it can apparently not be seen as distinct from the other risk factors in the lives of HIV-positive mothers in South-Africa. Shisana and colleagues (2014) found that a disproportionate number of HIV positive people in South Africa are from lower socio-economic backgrounds that are under-resourced, thus making it difficult to study HIV associated psychosis in isolation from other risk factors.

A limitation of this study was that other HIV related illnesses and Aids were not taken into consideration. As found by Peterson (1996), there may have been a difference in the attachment classifications in dyads where the mother was diagnosed with Aids versus being HIV positive and being healthy. This information was not available to the researchers as it is standard practice for the doctors from participating hospitals not to write the word "Aids" in patient files. A diagnosis of Aids is assumed based on a combination of other diagnoses and/or test results. In addition, future studies may also include a third group with a similar demography without a diagnosis of HIV. This will allow for a comparison between dyads where the mother is healthy versus HIV positive.

The importance of emotional support for mothers with HIV and psychosis is highlighted in our study. Mothers with a diagnosis of a psychotic disorder who reported a high number of people providing them with emotional support had a three times higher chance of having a secure attachment relationship with their children, compared to mothers with fewer emotional supporters. This was not the case for mothers from the HIV only group. Tempier and colleagues (2013) found that emotional support for people with psychotic disorders predicted shorter times before remission of the symptoms, thus shortening the time of psychotic exposure to the child and possibly preventing negative consequences for the attachment relationship. Support in the South African peri-urban and rural areas is a normal occurrence and especially older women (e.g., grandmothers) play an active role in the caregiving of the children. They support the younger adults in the household with financial, physical, and emotional means (Schatz, 2007). The mothers from the psychosis group were, however, less

likely to have a spouse as part of their support network. Spousal support did not predict attachment relationships in our study, but poor spousal support was associated with insecure attachment in another South African study by Tomlinson, Cooper, and Murray (2005). Their study was about the attachment relationships of infants of mothers living in poverty in a peri-urban setting similar to that of our sample.

The high percentage of disordered attachment classifications in this sample are put in relief through comparing with other normative and high risk samples. The dyads from this sample had significantly more frequently disordered attachment classifications even when compared to other high risk studies (Cyr et al., 2010). Although the children from this study were still of preschool age, their disordered attachment placed them in a vulnerable position, as Sroufe (2005) reported that the consequences of disorganized attachment in infancy were associated with the development of psychopathology by age 17½ years and older. Children with a disordered attachment relationship were at high risk for dissociation, weak impulse control, attention problems, as well as conduct disorder. The high rate of disordered attachment relationships from our sample is thus concerning as these children had a prolonged risk for developing psychopathology.

An important finding from this study was that the number of securely classified dyads did not differ significantly from normal populations despite the high number of risk factors imposing on the mother-child relationship. This was similar to what Tomlinson and colleagues (2005) found in another South African peri-urban sample, testifying to the resilience of these populations. They attributed this to the collectivistic cultural and social organization of indigenous South Africans that may play a protective role in the upbringing of children. When a secure parent-child attachment relationship exists, it may buffer the negative effects of a high risk context. Houston and Grych (2015) found that children with secure attachments who were exposed to violence, were less likely to be aggressive. The children from our sample were also exposed to contexts of violence and maltreatment and therefore secure attachment may safeguard them from becoming aggressive themselves. Tharner and colleagues (2012) also reported that secure attachment moderated the association between parenting stress and children's behavioural and emotional problems.

Conclusion

Children of mothers who were HIV-infected were at heightened risk for disordered forms of attachment. Living in high risk socio-economic circumstances, these mothers had to raise their children while trying to cope with a diagnosis of HIV and in some cases also the burdens of a mental illness like psychosis. The high prevalence of insecure and disordered attachment relationships that develop from this context gives testimony to the need for intervention in this community as the attachment relationship forms the basis of children's development in the long run. From the data, emotional support for the mothers with psychosis has been identified as a factor that future interventions may build on to promote attachment security. However, protective factors for the development of disordered attachment were not identified. Future efforts should thus focus on building the mothers' support networks with a focus on emotional support. Resiliency studies investigating the factors that promote secure, ordered attachment relationships in this population will also be important as secure attachment may provide a buffer against in a high risk context.

References

- Ainsworth, M.S., Blehar, M.C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the Strange Situation*. Hillsdale, NJ: Erlbaum.
- Alvarez-Segura, M., Villero, S., Mayoral, M. Montilla, P., & Fraguas, D. (2008). Psychosis induced by decreased CD4+ T cell and high viral load in human immunodeficiency virus infection: A case report. *Biological Psychiatry*, *64*(9), 3-4.
- American Psychiatric Association: *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, Text Revision. Washington, DC, American Psychiatric Association, 2000.
- Caron, J., Lecomte, Y., Stip, E., & Renaud, S. (2005). Predictors of quality of life in schizophrenia. *Community Mental Health Journal*, *41*(4), 399-417.
- Cassidy, J. & Marvin, R.S. (1992). *Attachment organization in preschool children: Procedures and coding manual*. Charlottesville, VA.
- Cyr, C., Euser, E.M., Bakermans-Kranenburg, M.J., & Van IJzendoorn, M.H. (2010). Attachment security and disorganization in maltreating and high-risk families: A series of meta-analyses. *Development and Psychopathology*, *22*(1), 87-108.
- D'Angelo, E. (1986). Security of attachment in infants with schizophrenic, depressed and unaffected mothers. *The Journal of Genetic Psychology*, *147*(3), 421-422.
- Dobrova-krol, N.A., Bakermans-Kranenburg, M.J., Van IJzendoorn, M., & Juffer, F. (2010). The importance of quality of care: Efforts of perinatal HIV infection and early institutional rearing on preschoolers' attachment and indiscriminate friendliness. *Journal of Child Psychology and Psychiatry*, *51*(12), 1368-1376.
- Dolder, C.R., Patterson, T.L., & Jeste, D.V. (2004). HIV, psychosis and aging: Past, present and future. *AIDS*, *18*(1), 35-42.

- Dolman, C., Jones, I., & Howard, L.M. (2013). Pre-conception to parenting: A systematic review and meta-synthesis of the qualitative literature on motherhood for women with severe mental illness. *Archives of Women's Mental Health, 16*, 173-196.
- Feeney, J.A. & Raphael, B. (1992). Adult attachments and sexuality: Implications for understanding risk behaviours for HIV infection. *Australian and New Zealand Journal of Psychiatry, 26*, 399-407.
- Groh, A.M., Roisman, G.I., Van IJzendoorn, M.H., Bakermans-Kranenburg, M.J., & Fearon, R.P. (2012). The significance of insecure and disorganized attachment for children's internalizing symptoms: A meta-analytic study. *Child Development, 83*(2), 591-610.
- Hoffman, K.T., Marvin, R.S., Cooper, G., & Powell, B. (2006). Changing toddlers' and preschoolers' attachment classifications: The circle of security intervention. *Journal of Consulting and Clinical Psychology, 74*(6), 1017-1026.
- Houston, J. & Grych, J. (2015). Maternal attachment buffers the association between exposure to violence and youth attitudes about aggression. *Journal of Clinical Child & Adolescent Psychology, 0*(0), 1-9.
- Koopman, C., Gore-Felton, C., Marouf, F., Butler, D., Field, N., Gill, M., ...Spiegel, D. (2000). Relationships of perceived stress to coping, attachment and social support among HIV-positive persons. *AIDSCare: Psychological and Socio-medical Aspects of AIDS/HIV, 12*(5), 663-672.
- Kroonenberg, P.M. Multinom for Windows (Version 2.0a) [Computer Software]. (1998). Leiden, The Netherlands: Leiden University.
- Lyons-Ruth, K. & Block, D. (1996). The disturbed caregiving system: Relations among childhood trauma, maternal caregiving, and infant affect and attachment. *Infant Mental Health Journal, 17*(3), 257-275.

- Madigan, S., Bakermans-Kranenburg, M.J., Van IJzendoorn, M., Moran, G., Pederson, D.R., & Benoit, D. (2006). Unresolved states of mind, anomalous parental behavior, and disorganized attachment: A review and meta-analysis of a transmission gap. *Attachment and Human Development, 8*(2), 89-111.
- Main, M. & Hesse, E. (1990). Parents' unresolved traumatic experiences are related to infant disorganized attachment status: Is frightened and/or frightening parental behavior the linking mechanism? In M.T. Greenberg, D. Cicchetti, E.M. Cummings (Eds.), *Attachment in the preschool years: Theory, research and intervention* (pp. 161-182). Chicago, IL, University of Chicago Press.
- Main, M. & Solomon, J. (1986). Discovery of an insecure-disorganized/disoriented attachment pattern. In T.B. Brazelton & M.W. Yogman (Eds.), *Affective Development in Infancy* (pp. 95-124). Norwood, NJ: Ablex.
- Näslund, B., Persson-Blennow, I., McNeil, T., Kaij, L., & Malmquist-Larsson. (1984). Offspring of women with non-organic psychosis: fear of strangers during the first year of life. *Acta Psychiatrica Scandinavica, 69*(5), 435-444.
- Peterson, N.J. (1994). *The impact of maternal HIV infection on infant to mother attachment*. Unpublished doctoral thesis, Case Western Reserve University.
- Schatz, E.J. (2007). "Taking care of my own blood": Older women's relationships to their households in rural South Africa. *Scandinavian Journal of Public Health, 35*(69), 147-154.
- Shisana, O., Rehle, T., Simbayi, L.C., Zuma, K., Jooste, S., Zungu, N.,... Onoya, D. (2014). *South African National HIV Prevalence, Incidence and Behaviour Survey, 2012*. Cape Town, HSRC Press.
- Spies, R., Sterkenburg, P.S., Schuengel, C., & Van Rensburg, E. (2013). Linkages between HIV/AIDS, HIV/AIDS-psychoses and parenting: A Systematic literature review. *Vulnerable Children and Youth Studies, 9*(2), 174-192.

- Spies, R., Sterkenburg, P.S., Van Rensburg, E., & Schuengel, C. (2015). *HIV/AIDS and Psychosis: needs, challenges and support of affected mothers*. Manuscript submitted for publication.
- Sroufe, L.A. (2005). Attachment and development: A prospective, longitudinal study from birth to adulthood. *Attachment and Human Development, 7*(4), 349-367.
- Tempier, R., Balbuena, L., Lepnurm, M., & Craig, T.K.J. (2013). Perceived emotional support in remission: Results from an 18-month follow-up of patients with early episode psychosis. *Social Psychiatry & Psychiatric Epidemiology, 48*, 1897-1904.
- Tharner, A., Luijk, M.P.C.M., Van IJzendoorn, M.H., Bakermans-Kranenburg, M.J., Jaddoe, V.W.V., Hofman, A.,... Tiemeier, H. (2012). Infant attachment, parenting stress, and child emotional and behavioural problems at age 3 years. *Parenting: Science and Practice, 12*, 261-281.
- Tomlinson, M., Cooper, P., & Murray, L. (2005). The mother-infant relationship and infant attachment in a South African peri-urban settlement. *Child Development, 7*(5), 1044-1054.
- Van der Voort, A., Juffer, F., & Bakermans-Kranenburg, M.J. (2014). Sensitive parenting is the foundation for secure attachment relationships and positive social-emotional development of children. *Journal of Children's Services, 9*(2), 165-176.
- Van IJzendoorn, M.H., Schuengel, C., & Bakermans-Kranenburg, M.J. (1999). Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Development and Psychopathology, 11*, 225-249.
- Wan, M.W. & Green, J. (2009). The impact of maternal psychopathology on child-mother attachment. *Archives of Women's Mental Health, 12*, 123-134.