



Published in final edited form as:

*Attach Hum Dev.* 2010 July ; 12(4): 355–374. doi:10.1080/14616730903416971.

## **Attachment Organization in a Sample of Incarcerated Mothers: Distribution of Classifications and Associations with Substance Abuse History, Depressive Symptoms, Perceptions of Parenting Competency, and Social Support**

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### **Abstract**

We report attachment classifications in a sample of pregnant women incarcerated in a state prison with a nursery program. Analyses were based on 69 women serving sentences for felony crimes who were followed from the birth of their child to completion of the prison nursery co-residence. They completed the Adult Attachment Interview shortly after entering the program and scales measuring depression, perceived parenting competency, and social support at study entry (Time 1) and program completion (Time 2). Incarcerated mothers had higher rates of insecure attachment than previous low-risk community samples. Compared with dismissing and secure mothers, preoccupied mothers reported higher levels of depressive symptoms, lower parenting competency, and lower satisfaction with social support at the conclusion of the nursery program. Higher scores on unresolved loss and derogation were associated with a history of substance abuse; higher scores on unresolved trauma were associated with depressive symptoms at program completion.

### **Keywords**

attachment; prison nursery; high-risk; depressive symptoms; parenting

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Establishment of a prison nursery is predicated on the fact that children benefit from sustained contact with their mothers throughout their early months of life (Goshin & Byrne, 2009). Attachment research suggests that a child's psychosocial outcomes are associated with the mother's internal working model of attachment (IWM) or attachment classification (e.g., van IJzendoorn, 1995). Therefore, the effectiveness of a prison nursery program may depend in part on the quality of the mother's IWM. As yet, however, nothing is known about the nature of attachment classifications of women participating in a prison nursery program. Further, although there is a substantial body of research linking adult attachment in the general population with various psychosocial correlates, links between attachment and other constructs have not been examined in samples of incarcerated women.

The present study had three aims. The first aim was to describe the distribution of maternal attachment representations within a sample of incarcerated mothers who co-resided with their infants in a prison nursery. The second aim was to evaluate the association between maternal attachment classification and history of substance abuse in this sample. The third aim was to examine the longitudinal connection between maternal attachment organization and three psychosocial constructs related to adjustment and parenting: depressive symptoms, perceptions of parenting competency, and perceived social support. Examining these issues was intended to aid our understanding of incarcerated women participating in a nursery program and to shed light on the nature of adult attachment.

Adult attachment organization has been measured with the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985; Main & Goldwyn, 1984) in a wide variety of samples and across multiple cultures (Bakermans-Kranenburg & van IJzendoorn, 2009). It allows researchers to identify three “organized” patterns of attachment (secure/autonomous, insecure/dismissing, and insecure/preoccupied), in what is called a three-way analysis, and also to examine an overlay of unresolved traumas or losses by including an insecure/unresolved group in a four-way analysis (individuals placed in the unresolved group are also assigned an underlying best-fitting classification in one of the three “organized” groups). Meta-analytic findings using the AAI have revealed that AAI distributions vary as a function of the nature of the sample (Bakermans-Kranenburg & van IJzendoorn, 2009). For instance, in low-risk, nonclinical samples, approximately 56% of women are classified as secure/autonomous (hereafter called secure), 16% as insecure/dismissing, 9% as insecure/preoccupied, and 18% as unresolved/cannot classify. Among low-socioeconomic (SES) mothers, the distribution of attachment classifications is markedly different with 30% being classified as secure, 32% dismissing, 7% preoccupied, and 32% unresolved/cannot classify (van IJzendoorn & Bakermans-Kranenburg, 1996). Clinical samples of men and women further depart from normative distributions, comprising 21% secure individuals, 23% dismissing, 13% preoccupied, and 43% unresolved/cannot classify (Bakermans-Kranenburg & van IJzendoorn, 2009).

Regarding the present study’s first aim – to examine the distribution of AAI classifications in a sample of mothers participating in a prison nursery program – our predictions are based on consideration of the characteristics of participating women. Women who are incarcerated are more likely than other women to come from impoverished backgrounds marked by victimization, drug use, and mental illness (Chesney-Lind & Pasko, 2004; Glaze & Maruschak, 2008; McClellan, Farabee & Couch, 1997; Siegel & Williams, 2003). Incarceration typically follows a long period of social instability, particularly for those who are substance abusing or mentally ill (Ehrensaft, Khasu, Ross, & Wamsley, 2003; Parke & Clarke-Stewart, 2003). Prison nursery residents have histories that are similar to women in the general prison population, yet, screening guidelines for most prison nursery programs exclude mothers with a history of a violent offense and those with a mental illness that prison administrators deem to be a potential impediment to caregiving (Women’s Prison Association, 2009). In a sample of incarcerated men with severe mental illness, van IJzendoorn and colleagues (1997) found that like clinical samples, as compared to nonclinical samples, the forensic sample had significantly fewer secure classifications and significantly more insecure-unresolved classifications. However, van IJzendoorn et al.’s sample, like the other forensic samples that have been examined (Fonagy et al., 1997; Lamott & Pfaefflin, 2001; Levinson & Fonagy, 2002; Marin-Avellan, McGauley, Campbell, & Fonagy, 2005), consisted of individuals with severe psychiatric impairment and a criminal history, whereas the participants in our study are female, non-psychiatrically impaired inmates. For these reasons, we predicted that the present sample would have lower rates of security than comparison samples of women from low-risk backgrounds, rates of security that were similar to comparison samples of women from impoverished backgrounds, and higher rates of security than samples of individuals with psychiatric diagnoses.

Attachment organization may be particularly important in women experiencing incarceration. Baradon and colleagues (Baradon, Fonagy, Bland, Lenard, & Slead, 2008) have suggested that, given the higher incidence of psychopathology in incarcerated women (Maruschak, 2008; NCCHC, 2002) and the greater prevalence of experiences of abuse (Bloom, Chesney, & Owen, 1994; Brown, Miller, & Maguin, 1999; Harlow, 1999), being in prison may be especially traumatizing for these women. If attachment organization is related to self-regulation, as several scholars have suggested (e.g., Cassidy, 1994; Mikulincer & Shaver, 2008), then we would expect that during times of additional stress, such as incarceration, individual differences in attachment organization would relate to individual differences in coping. Further, the problems that may be created by the interaction of a woman's attachment history and the prison environment may generate additional barriers that impair her ability to engage in effective caregiving.

The second and third aims of the present study, which concern correlates of individual differences in adult attachment in women participating in a prison nursery program, are explained below, and corresponding data analytic plans are outlined.

### **Attachment and Substance Abuse History**

The majority of incarcerated women have a history of substance abuse (Mumola & Karberg, 2006). The association between substance abuse and attachment status has not been studied frequently, but insecure attachment is thought to predispose a person to poor emotion regulation (Cassidy, 1994; Fonagy, Gergely, Jurist, & Target, 2001). To the extent that substance abuse can be a self-medicating strategy intended to mitigate or protect against distress (Khantzian, 1985), insecure individuals may be more likely to abuse substances as a way of regulating negative affect. In fact, two studies have shown that substance abuse is more common among individuals with unresolved attachment classifications (Fonagy et al., 1996; Riggs & Jacobvitz, 2002). But two other studies have suggested a link between dismissing attachment and substance abuse (Caspers, Yucuis, Troutman, & Spinks, 2006; Rosenstein & Horowitz, 1996). One study found that a scale associated with dismissing attachment (derogation of attachment experiences) was related to current hard drug use among previously hospitalized adults (Allen, Hauser, & Borman-Spurrell, 1996). Because of these previous findings, we examined attachment-related differences among the four AAI groups and predicted that compared to secure women, insecure/dismissing and insecure/unresolved women would be more likely to have a history of substance abuse and to have been incarcerated for a drug-related crime. We also predicted that these drug-related variables would be associated with greater derogation of attachment and greater lack of resolution of loss or trauma as assessed with two AAI scales.

### **Attachment and Depressive Symptoms**

There has been considerable theorizing about the relation between insecure attachment and depression, based on the idea that feelings of loss and rejection characterize both conditions (Bowlby, 1980; Cummings & Cicchetti, 1990). Research indicates that major depressive disorder is associated with both preoccupied attachment (Cole-Detke & Kobak, 1996; Fonagy et al., 1996; Rosenstein & Horowitz, 1996) and dismissing attachment (Patrick, Hobson, Castle, Howard, & Maughan, 1994) in adults, but that these groups differ in the presentation and/or underlying mechanism of the depression (Cole-Detke & Kobak, 1996; Dozier, Stovall, & Albus, 1999). Preoccupied adults may present with depression primarily characterized by an internalizing coping strategy in which the individual is extremely self-focused and engages in self-blame and self-deprecation, whereas dismissing adults may be more likely to have an externalizing strategy characterized by interpersonal hostility (Dozier et al., 1999).

Disorganized attachment is thought to emerge as a result of an inescapable paradox presented by a caregiver who is both the haven of safety and a source of fear (Hesse & Main, 2000). Over time, this pattern may lead to a sense of learned helplessness and the breakdown of coping strategies in the face of attachment-related stressors (Dozier et al., 1999), and as such, attachment researchers have hypothesized that unresolved attachment places individuals at increased risk for depression. Indeed, several empirical investigations have found that disorganized attachment is associated with depressive symptoms in children (e.g., Borelli, David, Crowley, & Mayes, 2009; Moss, Smolla, Dubois-Comtois, Mazzarello, & Berthiaume, 2006) and with major depressive disorder in adults (Fonagy et al., 1996; but see Patrick, Hobson, Castle, Howard, & Maughan, 1994, and Rosenstein & Horowitz, 1996, for contradictory findings).

In the present study we examined mothers' reports of depressive symptoms at the completion of a prison nursery program. Because incarcerated women are likely to have significant solitary and unstructured time, those prone to rumination and a focus on negative emotions may be at heightened risk for distress. Further, women who have particular difficulty being separated from loved ones may find incarceration especially challenging. Based on the notion that incarceration may be especially stressful for preoccupied individuals, we hypothesized that preoccupied mothers would report greater increase in depressive symptoms. Because it is often difficult to marshal sufficient sample sizes to distinguish the unresolved from the preoccupied group (Cassidy & Berlin, 1994), and given our specific interest in preoccupied women, we present analyses based on the three-way AAI classifications. Because of previous research linking depression and the unresolved AAI group, we supplement these analyses by also conducting analyses with rating scales assessing unresolved traumas and losses. We hypothesized that higher scores on scales indicating greater lack of resolution of trauma and loss (hereafter referred to as unresolved/trauma and unresolved/loss) would be associated with increases in depressive symptoms.

### **Attachment and Perceived Parenting Competency**

Evidence linking maternal attachment and parenting behavior abounds (e.g., Belsky, Hertzog, & Rovine, 1986; Cowan, Cohn, Cowan, & Pearson, 1996; Crowell & Feldman, 1989; Ward & Carlson, 1995; see De Wolff & van IJzendoorn, 1997, for a meta-analytic review) and generally converges on the conclusion that secure adults, compared with insecure ones, are more sensitive, warm, and involved parents. However, the link between maternal attachment and the mother's perception of parenting capabilities has yet to be evaluated. Perceptions of parenting provide a different window on the psychology of parenting than do observational assessments. In this study we assessed perceptions of parenting when mothers entered the study and again upon completion of the prison nursery program. Based on our expectation that preoccupied mothers in the prison nursery program would be at greater risk than other mothers in the program for negative psychosocial outcomes (proposed above), we used the three-way attachment distribution to test the hypothesis that AAI group differences in perceived competence would emerge, with preoccupied mothers reporting smaller increases in perceived parenting capability than their secure counterparts.

### **Attachment and Social Support**

There is ample research indicating that social support can buffer the effects of stress on individuals experiencing difficult life events (e.g., Olstad, Sexton, & Sogaard, 2001), and perceptions of social support are thought to relate to an adult's attachment organization (Slade, 2008). According to theory, adults with secure states of mind are presumed to be more likely to acknowledge the need for support and to accept it when it arrives. Conversely, adults with insecure states of mind are more likely to deny the need for social support, reject it when it is

offered, or become unsatisfied if it is not limitless (Slade, 2008). Theoretically speaking, it makes sense to expect preoccupied individuals to be dissatisfied with the social support available to them if limits exist on the support. In contrast, dismissing individuals may be unable to extract support from their social environments, but this may be more related to their inability to identify the need for support or to ask for support. However, given dismissing individuals' tendency to underreport distress (Dozier & Lee, 1995; Kobak & Sceery, 1988; see also Cassidy & Kobak, 1988), it seems unlikely that dismissing individuals would express dissatisfaction with social support. In the only study to examine the links between AAI classifications and social support, preoccupied adolescents reported lower trust in their social support and (at a trend level) lower satisfaction with that support than other adolescents (Larose & Bernier, 2001).

In the case of incarcerated mothers, perceptions of social support may be particularly important for mental health and low rates of recidivism upon release. The present study focused on two central aspects of social support: amount of social support and level of satisfaction with that support. Based on the theorizing outlined above, we predicted AAI group differences (based on the 3-way classification) related to social support, with preoccupied mothers reporting greater decreases in social support as well as less satisfaction with available support than secure mothers at completion of the prison nursery program.

## Method

### Participants

The women in this study were part of a larger study examining the effects of two components of a nurse-led intervention with prison nursery mothers. One component focused on traditional health outcomes and the other focused on the mother-child relationship. The nature and effects of the intervention are beyond the scope of this paper, but intervention group status is included as a covariate in all analyses. Participants were inmates of the New York State Department of Correctional Services (NYS DOCS) prison system who had children enrolled in the prison nursery program. One-hundred women enrolled in the larger study, and the 69 women who completed the AAI were included in the present study (health group = 29; relationship group = 40). (Thirty-one women involved in the study did not complete AAIs. The first 30 enrollees in the study did not complete the AAI because AAI interviewer training was not complete at the outset of the study. In addition, one participant who consented to complete the AAI chose to withdraw after the interview began.) The 69 women for whom AAIs were completed did not differ from the 31 women without AAIs on maternal age, ethnicity, history of substance abuse, primiparity, or type of crime. Participants ranged in age from 18 to 45 years ( $M = 28.5$ ,  $SD = 6.47$ ). Their ethnicities mirrored those in the prison nursery but were more diverse than the general prison population (42% African-American; 33.3% white; 20.3% Hispanic; 4.3% multi-racial). Approximately half of the women were first-time mothers (52.2%); the remainder had between one and eight previous children for whom they had provided full-time (56.8%) or part-time (27%) primary care immediately prior to incarceration. The majority of crimes (54.5%) related to sale or possession of controlled substances and an additional 28.8% of crimes involved burglary, larceny, or robbery. Maternal sentences ranged from 2 months to 10 years and women were imprisoned an average of 71 days ( $SD = 65$ ) before being accepted into the nursery program.

### Measures

**Adult attachment**—Adult attachment was assessed with the AAI (George et al., 1985; Main & Goldwyn, 1984), a 20-question semi-structured interview lasting approximately 45-90 minutes. Questions broadly probed adults' current assessment of their childhood relationships with their primary caregivers at both broad (semantic) and specific (episodic) levels, with a

particular focus on situations thought to invoke attachment-related needs (being hurt, upset, ill, and rejected). Verbatim transcripts were coded using scores on inferred experience scales (e.g., rejection) and state of mind scales (e.g., unresolved/loss). Transcripts were classified into one of five attachment categories: secure, dismissing, preoccupied, unresolved, and cannot classify. As is traditional practice in AAI coding, transcripts scored as unresolved or cannot classify were given an alternate organized classification (i.e., secure, dismissing, or preoccupied).

Psychometric properties of the AAI are well-established. Test-retest reliability (78% over a 2-month period using the three-category classification) is adequate (Bakermans-Kranenburg & van IJzendoorn, 1993), and meta-analytic findings indicate that the AAI predicts a mother's sensitivity to her child's signals and her child's attachment classification (van IJzendoorn, 1995). AAI classifications are unrelated to verbal and performance intelligence, social desirability, and non-attachment-related memory (Bakermans-Kranenburg & van IJzendoorn, 1993; see Hesse, 1999, 2008, for reviews).

Transcripts (with identifying information removed) were coded by one of two coders, both of whom were doctoral students in clinical psychology and had attended AAI training institutes led by Drs. Sroufe and De Goyman and had been certified as reliable by Drs. Main and Hesse. In this sample, intercoder agreement on 14 cases (22.5% of sample) was excellent (5-way:  $\kappa = .88, p < .001$ ; 4-way:  $\kappa = .89, p < .001$ ; 3-way:  $\kappa = .88, p < .001$ ; intraclass correlations for Unresolved loss = .94, Unresolved trauma = .89). Disagreements were resolved by conferencing. Because there were only four "Cannot Classify" AAIs (5.79% of sample), we used the best-fitting alternate classification for study analyses (e.g., an individual classified as cannot classify/preoccupied/dismissing was considered preoccupied for study analyses).

**Depressive symptoms**—The Center for Epidemiologic Studies–Depression Scale (CES-D; Radloff, 1977, 1986) was used to measure depressive symptomatology. This 20-item questionnaire probes how frequently symptoms occurred in the preceding week on a 4-point scale, with higher scores indicating more frequent depressive symptoms. The psychometric properties of the CES-D have been well established in community samples (Radloff, 1977, 1986). For the present sample, Cronbach's alpha was .80 at Time 1 (T1) and .87 at Time 2 (T2). Research also indicates that the CES-D is an appropriate tool for use with high-risk mothers (Wilcox, Field, Prodromidis, & Scafidi, 1998).

**Substance abuse**—A dichotomous variable was created for substance abuse history based on prison records and mandatory programming of women into a drug recovery program during imprisonment. Another dichotomous variable was created for drug-related crimes (in which drugs were illegally possessed or sold) based on prison records. Persons convicted of such crimes are not necessarily substance abusers.

**Perceived parenting competency**—Perceived parenting competency was assessed with the Perceived Competency in Knowledge subscale of the Parenting Sense of Competency Scale (PSOC; Gibaud-Wallston & Wandersman, 1978; Johnston & Mash, 1989). This 11-item self-report subscale measures mothers' perceptions of their knowledge about their children on a 6-point Likert-type scale; higher scores indicate greater perceived knowledge. Sample items are as follows: "I do not feel prepared to care for my child," "Knowing how to settle problems as a parent is easy," and "I believe I have the skills to be a good mom to my children." Cronbach's alpha in this sample was adequate (.71 at T1 and .56 at T2).

**Social support**—The Sarason Social Support Questionnaire (SSQ) is a self-report measure that assesses the number of persons available for various kinds of social support and the level of satisfaction on a 6-point scale for each source of support received (Sarason et al., 1983). A

6-item short form found to be highly correlated with the long version was used in this study (Sarason, Shearin, Pierce, & Sarason 1987). Participants report the number of persons available for particular types of support (SSQ-N) and rate how satisfied they are with each type of support (SSQ-S) on a 6-point scale, with higher scores indicating greater satisfaction. The reliability and validity of both the long and short versions of the SSQ are well established (Heitzman & Kaplan, 1988; Sarason et al., 1983, 1987). Cronbach's alpha for this sample was excellent (SSQ-N: .91 and .88 at T1 and T2, respectively; SSQ-S: .89 and .93 at T1 and T2, respectively).

## Procedure

Following the acquisition of each participant's informed written consent, study questionnaires (CES-D, PSOC, SSQ) were administered (Time 1) and substance abuse history was retrieved. Questionnaires were re-administered at nursery program completion (Time 2). Mean length of time between T1 and T2 was 8.4 months ( $SD = 4.4$ ; range = 1.6 to 17.5). The AAI was administered one month following intake by a trained Graduate Research Assistant or the Principal Investigator. Interviews ranged in length from 30 to 75 minutes.

**Data analytic plan**—In all analyses examining the prospective association between attachment and psychosocial outcomes, we controlled for T1 levels of the dependent variable. Thus, these analyses indicate *change* in the variable. We included treatment group as a covariate in all prospective analyses because the interventions may affect the link between attachment and dependent variables. In addition, because of the known impact of depression on self-perceptions, T1 self-reported depressive symptoms were also included as covariates in all models evaluating longitudinal associations between variables.

## Results

### Descriptive Statistics

Table 1 reports means and standard deviations for all dependent variables by attachment classification. Table 2 reports the results of bivariate correlations of study variables. Results of a chi-square analysis revealed no statistically significant differences in adult attachment classifications by treatment group, and the results of independent samples *t*-tests revealed no significant differences in levels of depressive symptoms or social support in the two treatment groups. However, women who had been randomly assigned to the health treatment condition had significantly greater T1 PSOC knowledge relative to women assigned to the relationship treatment condition,  $t(67) = -2.14, p < .05$ .

### Distribution of Attachment Classifications

Using the 4-way AAI classification system, 35% of participants were secure, 20% were insecure-dismissing, 13% were insecure-preoccupied, and 30% were insecure-unresolved. Using the 3-way organized classification system, 41% were secure, 28% were insecure-dismissing, and 32% were insecure-preoccupied, and using the two-way system (secure versus insecure), 35% were secure and 65% were insecure. In order to evaluate our hypothesis that the prison sample would differ significantly from low-risk samples but not from high-risk and clinical samples, we used goodness-of-fit chi-square tests to compare the distribution of AAIs of the mothers in this study with the normative and clinical distributions reported in Bakermans-Kranenburg and van IJzendoorn's (2009) meta-analysis, and with the high-risk (low SES) distribution reported in van IJzendoorn and Bakermans-Kranenburg's (1996) meta-analysis. Where significant differences were found, additional chi-square comparisons were made for each sub-classification. Because ours is the first sample of incarcerated women for which AAI distributions have been measured, we report comparisons using the two, three, and four-way category systems (see Table 3).

As predicted, results indicate that the prison sample had rates of secure attachment that were lower than those found in low-risk samples, similar to rates found in low SES) samples, and higher than those found in clinical samples. In the three-way and four-way analyses, there were fewer secure and more preoccupied individuals in the prison sample than in the low-risk samples and more secure individuals than in the clinical samples (Table 3).

### Attachment and Substance Abuse History

A contingency analysis examining the association between four-way attachment classifications and substance abuse history was not significant,  $\chi^2(3) = 1.17$ , *ns*, nor was a similar analysis examining the association between attachment and having committed a drug-related crime,  $\chi^2(3) = 5.83$ , *ns*.

The results of a logistic regression analysis examining the association between the AAI derogation scale and maternal substance abuse history indicated that derogation significantly altered the odds ratio, Wald  $\chi^2(1, 67) = 6.36$ ,  $p < .01$ . As derogation increased, the odds of having a history of substance abuse also increased,  $\beta = .38$ ,  $p < .01$ . Similarly, the results of a logistic regression analysis examining the association between the AAI derogation scale and having committed a drug-related crime revealed that derogation significantly altered the odds ratio,  $\chi^2(1, 67) = 6.43$ ,  $p < .01$ : as derogation increased, the odds of having committed a drug-related crime also increased  $\beta = .76$ ,  $p < .01$ .

Logistic regression analyses were also conducted to examine the link between unresolved states of mind and substance abuse history. In a first logistic regression, depressive symptoms at intake were entered in step 1 (as a control variable) and unresolved/loss was entered in a second step. Results indicated that depressive symptoms,  $\chi^2(1, 67) = 1.93$ , *ns*, did not significantly alter the odds ratio, but unresolved loss score did  $\chi^2(1, 67) = 7.23$ ,  $p < .01$ . As scores on unresolved loss increased, the odds of having a history of substance abuse also increased,  $\beta = .41$ ,  $p < .01$ . The results of a second regression using unresolved/trauma as an independent variable indicated that neither depressive symptoms,  $\chi^2(1, 67) = 1.26$ , *ns*, nor scores on the unresolved/trauma scale,  $\chi^2(1, 67) = 0.03$ , *ns*, predicted an altered odds ratio for maternal history of substance abuse.

### Attachment and Depressive Symptoms at Prison Nursery Release

An ANCOVA was conducted using T2 depressive symptoms as the dependent variable, the three category attachment classification as the predictor, and T1 depressive symptoms and treatment group as covariates. Results revealed that T1 depressive symptoms,  $F(1, 59) = 1.16$ , *ns*, were not related to depressive symptoms at release, but that both treatment condition,  $F(1, 59) = 13.08$ ,  $p < .001$ , and attachment classification,  $F(2, 59) = 5.54$ ,  $p < .01$ , were significant predictors of T2 depression in the model (see Table 4). The statistical interaction between treatment group and attachment classification was not significant. The results of a simple planned contrast analysis revealed that preoccupied mothers reported significantly greater increases in depressive symptoms than dismissing mothers,  $t(35) = 2.12$ ,  $p < .01$ , and secure mothers,  $t(40) = 2.02$ ,  $p < .01$ .

Two hierarchical regression analyses were conducted to evaluate the association between unresolved states of mind and T2 depressive symptoms. A first regression revealed that after controlling for treatment condition in the first step,  $R^2 = .14$ ,  $p < .01$ , and T1 depressive symptoms in the second step,  $\Delta R^2 = .00$ , *ns*, the unresolved/loss scale did not add to the prediction of T2 depression,  $\Delta R^2 = .00$ , *ns*. After controlling for participants' treatment condition in the first step,  $R^2 = .11$ ,  $p < .05$ , T1 depressive symptoms were entered in the second step,  $\Delta R^2 = .00$ , *ns*, and unresolved/trauma was entered in the third step,  $\Delta R^2 = .10$ ,  $p < .05$ .



Results revealed that unresolved/trauma was associated with increases in depressive symptoms.

### Attachment and Perceptions of Parenting Competency at Prison Nursery Release

To examine the association between attachment classification and mothers' perceptions of competency in the parenting role, an ANCOVA with the three-category attachment classification as the independent variable and T2 perceptions of parenting competency as the dependent variable was conducted. As in prior analyses, treatment condition, T1 parenting competency, and T1 depressive symptoms were included as covariates. Results revealed that treatment condition,  $F(1, 59) = 1.52, ns$ , and T1 perceived parenting competency,  $F(1, 59) = 2.83, ns$ , were not related to T2 perceived parenting competency, but that both T1 depressive symptoms,  $F(1, 59) = 5.35, p < .01$ , and attachment classification,  $F(2, 59) = 3.22, p < .01$ , were significant predictors (see Table 4). The results of a simple planned contrast analysis revealed that preoccupied mothers reported significantly greater decreases in parenting competency than dismissing mothers,  $t(35) = -2.65, p < .01$ , or secure mothers,  $t(40) = -3.15, p < .01$ .

### Attachment and Perceptions of Social Support at Prison Release

In order to evaluate the link between attachment and perceptions of amount of social support, an ANCOVA with the three-category attachment classification as the independent variable and social support as the dependent variable was conducted. Treatment condition, T1 depressive symptoms, and T1 social support were included as covariates. The results (see Table 4) indicated that attachment classification,  $F(2, 59) = .85, ns$ , was not a significant predictor of perceived amount of social support at T2. Results of a second ANCOVA indicated that attachment classification,  $F(2, 59) = 3.32, p < .05$ , was a significant predictor of satisfaction with support at T2. The results of simple planned contrasts revealed that preoccupied mothers reported significantly greater decreases in satisfaction with their support than dismissing mothers,  $F(1, 59) = 3.46, p < .05$ , or secure mothers,  $F(1, 59) = 5.79, p < .05$ .

## Discussion

Studies collecting more than 10,000 AAIs have now been reported (Bakermans-Kranenburg & van IJzendoorn, 2009) in diverse populations. This investigation sought to evaluate attachment using the AAI for the first time in a sample of incarcerated mothers participating in a prison nursery program. The purpose of this investigation was to characterize the sample in terms of maternal attachment at the outset of mothers' participation in the prison nursery program, and to examine the association between attachment and substance abuse history, as well as depressive symptoms, perceptions of parenting competency, and social support at the completion of the nursery stay, all of which are likely to be important for incarcerated mothers' adjustment to life outside the prison. Our working hypothesis was that preoccupied mothers would be at greater risk for maladjustment given theoretical and clinical reports of their tendency to become overwhelmed by negative affect and their difficulty with separations (Hesse, 2008; Slade, 2008). Results of the investigation generally supported our hypotheses.

### Distribution of Attachment Classifications

Using meta-analytic samples for comparison, we found that the mothers in our sample were more insecure than community samples, less insecure than clinical samples, and not different from poverty samples. Unlike van IJzendoorn et al.'s (1997) findings with incarcerated and mentally ill men, the women in this sample were indistinguishable from low SES samples in terms of their attachment. Given the well-documented links among mothers' attachment organization, their parenting behavior (e.g., Belsky et al., 1986), and their child's attachment pattern (e.g., van IJzendoorn, 1995), the prevalence of insecure attachment at prison entry strongly suggests the need for parenting interventions with this population. For these mother-

child dyads, frequent separations, family upheaval, and exposure to domestic and community violence may provide a backdrop for the development of the mother-child relationship (Poehlmann, 2005), rendering intervention even more crucial. Future work is needed to further characterize the attachment classification distributions of incarcerated populations, to examine the impact of incarceration on attachment representations, and to evaluate interventions focused on attachment insecurity.

### **Attachment and Substance Abuse History**

Results indicated that organized attachment classifications were unrelated to the likelihood of having a substance abuse history or having committed a drug-related crime. However, in line with previous research (Allen et al., 1996), higher scores on the derogation scale were related to increased odds of having a substance abuse history and of having committed a drug-related crime. In addition, higher levels of unresolved/loss, but not unresolved/trauma, related to a greater likelihood of a history of substance abuse. This study's findings are consistent with the self-medication hypothesis of substance abuse (Khantzian, 1985), in that individuals thought to be experiencing emotional distress may be more likely to resort to the use of substances to reduce negative affect. Derogation, too, is conceptualized as a strategy used to down-regulate negative feelings towards individuals, particular situations, or the self. Adults who employ this technique effectively cut off discussion of the topic in question (Hesse, 1999), thereby curbing their own discomfort with certain affects. Indicators of unresolved attachment are thought to represent a collapse in strategies to regulate emotion in the face of overwhelming distress. Given this, it is easy to understand how these aspects of attachment would be linked to a greater likelihood of engaging in a behavior that fulfills a self-medicating function. However, as yet it is unclear why unresolved states of mind with respect to loss and not unresolved states of mind with respect to trauma were linked to a history of substance abuse, and why unresolved loss was not related to likelihood of having committed a drug related crime. Future research should determine whether this result is replicated.

### **Attachment and Depressive Symptoms**

Preoccupied mothers in this investigation reported greater increases in depressive symptoms following participation in the nursery program than were reported by secure and dismissing mothers. This is unsurprising in light of previous research that found greater likelihood of depressed states and syndromes in preoccupied adults (Cole-Detke & Kobak, 1996; Fonagy et al., 1996; Rosenstein & Horowitz, 1996), and provides initial support for the idea that preoccupied mothers remain at greater risk of depression throughout their first year of incarceration. It remains unclear, however, whether the differences observed in the current study reflect true differences in depressive symptoms or in self-reporting biases. Dismissing attachment may be associated with a general tendency to underreport distress (e.g., Dozier & Lee, 1995), whereas preoccupied attachment may be associated with a tendency to amplify or overreport distress (e.g., Dozier & Lee, 1995; Pianta et al., 1996). Therefore, differences in reporting styles must be retained as alternative explanations for these results.

In addition, mothers with higher scores on the unresolved/trauma scale but not the unresolved/loss scale also reported greater increases in depressive symptoms at completion of the prison nursery program. The link between unresolved trauma and depressive symptoms resonates with theorizing (Bowlby, 1980) and previous reports (e.g., Fonagy et al., 1996). It is interesting to note that only unresolved/trauma (and not loss) predicted greater increase in depression over time. An explanation for this finding is that incarceration, with all of its attendant features (separation from loved ones, removal from home and personal environment, stigmatization, reprimand), is a traumatizing experience, and that individuals who are higher on unresolved/trauma may be more likely to react in a helpless, hopeless manner to subsequent traumas. Mothers who are higher on unresolved/trauma may be more likely to develop a learned

helplessness-type of depression when confronted with additional traumatic events. However, mothers classified as unresolved were not more likely to have increases in depressive symptoms over time. Furthermore, despite our speculation, there is no clear explanation for why unresolved states of mind with respect to trauma but not loss were associated with increases in depression. Given this, replication of these findings is essential to evaluate whether unresolved states of mind with respect to loss and trauma are differentially associated with clinical symptoms.

### **Attachment and Perceptions of Parenting Competency**

Preoccupied mothers showed greater decreases in parenting competency than secure and dismissing mothers following participation in a prison nursery and intervention program. The perception of having less parenting competency may translate into lower feelings of efficacy in the parenting role. The use of hyperactivating emotion regulation strategies (Cassidy, 1994; Kobak, Cole, Ferenz-Gillies, Fleming, & Gamble, 1993) by the preoccupied group may interact with the characteristics of the prison environment (isolation, separation from loved ones, lack of distraction) to result in poorer general self-perceptions as well as lower parent-related perceptions. One question that future research should address is whether the preoccupied incarcerated mothers really are less knowledgeable or whether they just perceive themselves to be less knowledgeable. In addition, dismissing mothers did not differ from secure mothers in parenting competency, which is consistent with previous research on reporting styles of dismissing adults (Dozier & Lee, 1995; Kobak & Sceery, 1988). In this case it will also be important for future studies to examine whether dismissing incarcerated mothers' reports of parenting competency are accurate assessments.

### **Attachment and Perceptions of Social Support**

There were no attachment-based differences in the change in *number* of social support figures mothers identified following completion of the prison nursery program; however, preoccupied mothers reported significantly greater decreases in *satisfaction* with available supports than secure and dismissing mothers reported. Separations from loved ones may be particularly challenging for preoccupied individuals, who may not be able to use internalized representations of these individuals to sustain them throughout incarceration. Therefore, preoccupied women may be less satisfied with the support they perceive to be available to them. This finding, too, may suggest increased risk for preoccupied mothers upon release from prison, especially given the known association between perceptions of support and resilience (Olstad et al., 2001).

### **Study Limitations**

This investigation is innovative in that it is the first to examine adult attachment in a difficult-to-assess but increasingly significant high-risk sample: mothers participating in a prison nursery program. However, the design has several limitations. First is the reliance on self-report data to measure depressive symptomatology and parental competency as dependent variables. Although in this investigation we were primarily interested in the association between attachment and mothers' perceptions of themselves and their life circumstances, in future investigations it would be profitable to include objective assessments of these maternal characteristics. Second is the generalizability of the findings, which can be extended to women incarcerated in prison nurseries in the eight states that now provide them, but do not necessarily describe the majority of other incarcerated mothers who are separated from their children because of screening procedures for entry into a prison nursery. Distance parenting takes various forms with a range of involvement by incarcerated mothers depending on their geographic distance from home, nature of custody arrangements, family factors, and prison resources. Attachment remains a relevant subject for additional research with these women.

Furthermore, incarcerated individuals with severe psychiatric disorders are likely to be a different population than the prison nursery population and to have significantly greater rates of attachment insecurity than was found in this sample, as previous research has already demonstrated (van IJzendoorn, 1997). Therefore, future research ought to further examine attachment and its association with psycho-social constructs of interest among various segments of the incarcerated population. Third, the study was correlational, thereby precluding causal inferences. Fourth, the ways in which pre-intervention maternal attachment categories interacted with treatment to contribute to the maternal outcomes of interest in this study could not be tested with this sample size.

### **Implications of Study Findings for Work with Incarcerated Populations**

Though preliminary, if replicated these findings should inform our understanding of women in the prison nursery system in several ways. First is the fact that the women in this sample were not significantly different from low SES, high-risk samples in terms of their attachment distribution. This may mean that parenting interventions, and specifically interventions targeted at improving the parent-child attachment relationship in the community (e.g., Hoffman, Marvin, Cooper, & Powell, 2006), could be utilized with this population with minimal modifications to address issues specific to incarceration settings. In addition, the findings of this study underscore the vulnerability of incarcerated mothers with preoccupied and unresolved states of mind. Incarceration represents a prolonged separation from loved ones, and as such, is inherently a stress to the attachment system. Women with insecure states of mind may be more susceptible to psychological deterioration when confronted with this stressor. Future interventions with incarcerated mothers may benefit from incorporating assessments of attachment security and targeting mothers with preoccupied and unresolved states of mind to receive additional support and preventive mental health care.

### **Conclusion**

This study provided an important first examination of the nature of adult attachment in imprisoned mothers who were enrolled in a prison nursery program. Given the known risks experienced by this population, as well as the implications of these mothers' psychological functioning for their newborns' social-emotional development, future research should be devoted to this topic. The results of this study converge on the idea that among imprisoned mothers participating in a prison nursery program, preoccupied mothers are at the greatest risk for deleterious psycho-social outcomes, though mothers with unresolved states of mind are more likely to have increases in depressive symptoms and a history of substance use. One interpretation for these findings is that within relatively chaotic, turbulent life circumstances, both secure and dismissing attachment appear to be more adaptive in terms of the outcomes measured in this investigation. It is our hope that these results will spur future research to improve the psychosocial functioning of this population.

### **Acknowledgments**

This research was supported by NIH award RO1 NR007782-04, M. Byrne, P.I., and NIH Grant 1-F32AG032310-01, J. Borelli.

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**Table 1**  
**Descriptive Statistics: Mean (SD) of Depressive Symptoms, Parenting Competency, and Social Support by Organized Attachment Category**

	<u>Full Sample</u>	<u>Breakdown by three-way attachment classification</u>		
	<i>N</i> = 69	Dismissing <i>n</i> = 28	Secure <i>n</i> = 28	Preoccupied <i>n</i> = 22
Time 1 Depressive Symptoms	19.29 (9.16)	18.95 (10.19)	20.57 (9.04)	17.76 (8.40)
Time 2 Depressive Symptoms	18.77 (11.24)	16.00 (9.61)	16.96 (9.58)	24.11 (13.42)
Time 1 Parenting competency	47.46 (7.20)	46.15 (8.54)	48.32 (6.85)	47.72 (6.15)
Time 2 Parenting competency	48.58 (5.95)	49.89 (6.20)	50.26 (5.48)	45.06 (4.92)
Time 1 Social Support Figures	2.66 (1.28)	2.53 (1.21)	2.55 (1.21)	2.97 (1.45)
Time 2 Social Support Figures	2.41 (1.16)	2.26 (.99)	2.60 (1.36)	2.29 (1.06)
Time 1 SS Satisfaction	5.57 (.80)	5.77 (.53)	5.33 (1.06)	5.71 (.45)
Time 2 SS Satisfaction	5.35 (1.11)	5.67 (.64)	5.39 (.79)	4.97 (1.67)

**Table 2**  
**Pearson Correlations among Unresolved Loss/Trauma, Depressive Symptoms, Parenting Sense of Competency, and Perception of Social Support**

	1	2	3	4	5	6	7	8	9	10
(1) Unresolved/loss		.01	.22	.06	-.04	-.23	.05	.14	-.03	-.05
(2) Unresolved/trauma			-.07	.21	.05	-.12	.08	-.19	.08	-.29*
(3) Time 1 Depressive Symptoms				.05	-.20	-.40***	-.29**	.12	-.04	.00
(4) Time 2 Depressive Symptoms					-.05	-.36**	.07	-.19	.08	-.34**
(5) Time 1 Parenting competency						.25*	.13	.17	-.02	.05
(6) Time 2 Parenting competency							-.03	.06	.00	.20
(7) Time 1 Number of Social Support Figures								.34**	.25*	-.05
(8) Time 2 Number of Social Support Figures									.22	.27*
(9) Time 1 Satisfaction with Social Support										.41***
(10) Time 2 Satisfaction with Social Support										

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

**Table 3**  
**Comparisons of Attachment Distributions in the Prison Nursery Sample to Meta-analyzed Distributions of Low-SES and Clinical Samples**

Comparison Group	Number of Participants Included in Comparisons	Two-way (F versus non-F) Prison nursery relative to comparison samples	Three-way (F, Ds, E) Prison nursery relative to comparison samples	Four way (F, Ds, E, U) Prison nursery relative to comparison samples
Low-risk mothers (nonclinical) <i>a</i>	Total = 748 Two-way = 700 Three-way = 748 Four-way = 700	$\chi^2 (1, N = 69) = 12.77, p < 0.001$	$\chi^2 (2, N = 69) = 9.83, p < 0.001$ Fewer F (41% vs 58%) $\chi^2 (1, N = 69) = 8.62, p < 0.01$ More E (32% vs 19%) $\chi^2 (1, N = 69) = 6.63, p \leq 0.01$	$\chi^2 (3, N = 69) = 15.27, p < 0.01$ Fewer F (35% vs 56%) $\chi^2 (1, N = 69) = 12.01, p < 0.001$ More E (13% vs 9%) $\chi^2 (1, N = 69) = 9.01, p < 0.05$ More U (30% vs 18%) $\chi^2 (1, N = 69) = 6.38, p < 0.05$
Low SES <sup><i>b</i></sup>	Total = 411 Two-way = 350 Three-way = 411 Four-way = 350	$\chi^2 (1, N = 69) = 9.01, p < 0.01$	$\chi^2 (2, N = 69) = 6.77, p < 0.05$ More E (32% vs 20%) $\chi^2 (1, N = 69) = 5.39, p < 0.05$	$\chi^2 (3, N=69) = 3.21, ns.$
Clinical <sup><i>a</i></sup>	Total = 1965 Two-way = 1854 Three-way = 1965 Four-way = 1854	$\chi^2 (1, N = 69) = 7.17, p < 0.01$	$\chi^2 (2, N = 69) = 6.38, p < 0.04$ More F (41% vs 27%) $\chi^2 (1, N = 69) = 6.01, p < 0.05$	$\chi^2 (3, N = 69) = 9.34, p < 0.03$ More F (35% vs 21%) $\chi^2 (1, N = 69) = 7.17, p < 0.01$ Less U (30% vs 43%) $\chi^2 (1, N = 69) = 4.73, p < 0.05$

Note. Secure = F; Dismissing = Ds; Preoccupied = E; Unresolved = U

<sup>*a*</sup> based on Bakermans-Kranenburg & van IJzendoorn, 2009

<sup>*b*</sup> based on van IJzendoorn, 1996

**Table 4**  
**Means (and SDs) for Depressive Symptoms, Perceived Parenting Competency, and Social Support by Attachment Classification**

T2 Dependent Variables	Depressive Symptoms	Perceived Parent Competency	Social Support Amount	Social Support Satisfaction
3-way Attachment Classifications:				
Secure	17.48 (9.44) <sup>a</sup>	49.04 (1.13) <sup>a</sup>	2.62 (.23) <sup>a</sup>	5.56(.21) <sup>a</sup>
Dismissing	14.84 (9.01) <sup>a</sup>	49.65 (1.16) <sup>a</sup>	2.19 (.23) <sup>a</sup>	5.46 (.21) <sup>a</sup>
Preoccupied	24.80 (12.87) <sup>b</sup>	44.76 (1.24) <sup>b</sup>	2.30 (.27) <sup>a</sup>	4.79 (.24) <sup>b</sup>
Overall ANCOVA	$F(1, 59) = 3.98$	$F(1, 59) = 10.30$	$F(1, 59) = .85$	$F(1, 59) = 5.79$

Note. Groups with different superscripts in the same column differ significantly from each other.

\* $p < .05$

\*\* $p < .01$