

***Children at Double Jeopardy:  
Socio-emotional Outcomes of Premature Infants Living in  
Poverty***

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Abstract

Early childhood development is one of the most crucial periods of human development. This fundamental period is not uniform for all children. Obstacles and challenges often arise hindering the process. This study focuses on the specific obstacles and challenges of prematurity and poverty on a particular set of socio-emotional outcomes. These include the questions 1) Are there any direct effects of prematurity and poverty on parenting, quality of attachment, and behavioral problems and competencies? 2) Are the effects of prematurity and poverty indirect, via their direct effects on parenting? To what degree does parenting matter in predicting socio-emotional outcomes in these infants? 3) If parenting does matter, what predicts individual differences of parenting in poverty? In this study, these outcomes and effects will be critically analyzed and discussed.

**Prematurity**

In 2003, 1 in 8 children (12.3% of live births) were born prematurely in the United States. (March of Dimes, 2005). A child is considered premature when they are born before the normal 37-40 weeks of gestation. Being born too soon may have direct effects on brain development, and may cause problems with some medical treatments that must be administered. (Aylward, 2005) This can be attributed to the fact that the infant is now developing outside of its normal environment, which at that time would be the mother's womb. Prematurity impedes a child's well-being; this affects their early years but will also carry on into their later development. Premature children experience higher instances of grade retention, learning disabilities, and school dropout as older children and adolescents. (Brooks-Gunn et al., 1997; Lamb, 1999). These factors can make the parenting of premature infants difficult.

In addition, to the stress and anxiety of being new parents, parents of premature infants are themselves "premature", having given birth to a baby that came unexpectedly. Because of this, parents of premature infants experience high levels of distress

(depression, anxiety, guilt), which are associated with poor parenting (Teti et al., 1996). Also, premature infants' social signals and needs are difficult to "read" by parents, making parenting the premature infant more challenging than parenting a full-term infant. Because premature infants tend to be more lethargic, the mothers work harder to create and sustain interactions but receive fewer positive responses from the premature infants in comparison to full term babies. (Singer et al., 2003, Bartlett et al., 2006)

It is an unfortunate truth that there are higher rates of premature births among families living in lower socioeconomic statuses. Prematurity rates are also reported to be higher among African Americans. According to the March of Dimes, in 2002, 17.7% of all live premature births were born to African American mothers. (March of Dimes, 2004) With the developmental hazard of prematurity against them, the added burden of living in poverty further hinders a child's development.

### **Poverty**

Approximately 296,450 families are currently living at or below the federally established poverty threshold. (U.S. Bureau of Census, 2007) These families are living in impoverished neighborhoods that can affect both the child's development and parenting. (Evans, 2004; McLoyd, 1998) Living in these impoverished neighborhoods may directly affect development; this may be the result of higher levels of toxins, such as lead, water and air pollutants, substandard living, lower levels of cognitive stimulation, higher rates of violent crimes and illegal substance use that the child is exposed to. Parenting is affected because not only is the parent trying to construct and sustain a safe and secure environment for their child within their home they must also be conscience and wary of what is going on within the neighborhood.

In these impoverished families are children who are unfortunately entering society at a disadvantage. The disadvantage encountered is these families are unable to provide financial and/or emotional support for their children. Without this, much needed support the children suffer. This highlights that poverty can affect children directly and indirectly, it directly affects children through its influence on their development. Indirectly, it affects children through such mechanisms as parenting.

A parent's ability to provide effective, compassionate, and supportive care becomes compromised when stressors such as poverty, economic loss, and prematurity affect the family unit. (McLoyd, 1997; Yates, Egeland, and Sroufe, 2003) Also, socioeconomic instability has a negative effect on parenting which in turn is thought to be the primary mediator between poverty and a child's development. (Yates, Egeland, and Sroufe, 2003) Mounting stressors may cause parents to react harshly and implement physical methods of punishment. Poverty may also cause parents to become withdrawn and uninvolved in their child's life. These harsher, but sometimes nonexistent, forms of discipline may have lasting effects. A child's impression of the world as volatile, unsafe, and irregular can stem from the erratic and unpredictable care they received in their early years. (Yates, Egeland, and Sroufe, 2003)

Many children succumb to the pressure that poverty and negative life experiences put upon them and travel along the same path that have always known. The children in the present study are at risk for poor developmental outcomes for at least two reasons. First, they were born too soon, and are at medically and environmentally at risk. Second,

they have been exposed to adversity in the form of poverty and its associated stressors.

Within the study there are three questions to be asked 1) Are there any direct effects of prematurity and poverty on socio-emotional development among African American premature infants in low-income families? 2) Are the effects of prematurity and poverty indirect, via their direct effects on parenting? To what degree does parenting matter in predicting socio-emotional outcomes in these infants? 3) If parenting does matter, what predicts individual differences of parenting in poverty?

## **Methods**

### **Participants**

The data used in this study came from an intervention study, *The Preterm Infant Development Study*, conducted by Dr. Douglas M. Teti. The original study was designed to evaluate and promote maternal sensitivity and infant development. The intervention portion of the study will not be discussed in this one.

For the study 173 families were recruited, the participants were selected from four Neonatal Intensive Care Units (NICUs) within the Baltimore/Washington, D.C. metropolitan area. All of the participants were of African American descent and all the mothers were older than the age of eighteen at the time of the study ( $M = 26.77$  yrs.). Mothers had refrained from taking any drugs during their time of pregnancy, this was determined in two ways, a maternal self-report or toxicity screening. Of the 173 families, involved 78 % of families were on public assistance and in addition, 54 % of the mothers involved were not married/living with a partner. The infants involved in the study were all born prematurely,  $M$  gestational age = 30.12 wks (range was from 28-38 weeks).  $M$  birth weight = 1409.15 gms (range 480 – 3150 gms). Among the infants, involved 57 % were females. (Teti et al., 2006)

### **Procedure**

Assessments were conducted at several points during the infant's development. A baseline assessment at 32-36 weeks, another at 54-58 weeks post-conceptual age (3-4 months corrected for prematurity), and the final sets at 12 and 24 months, also corrected for prematurity. During these assessments three socio-emotional outcomes were evaluated, quality of infant-mother attachment, and infant behavior problems and behavior competencies. In addition, maternal sensitivity was assessed at 54-58 wks, 12, and 24 months of age.

### **Measures**

#### *Attachment Q-Set*

The Attachment Q-Set (AQS) (Waters, 1995) was used to measure security and quality of infant-mother attachment. It is a collection of 90 cards describing various scenarios/statements of child attachment behaviors. These cards are sorted into groupings numbered from 1-9 (1-most unlike the child, 9- most like the child), by trained observer(s), on whether or not the scenarios/statements described on the card is

characteristic of the observed child. The scores collected from the observations are then correlated against a set of averaged criterion scores based upon the theoretical “most secure” child, to determine how securely attached the child is to the mother. (Teti, 1996)

### *Maternal Behavior Q-Set*

The Maternal Behavior Q-Set (MBQ) (Pederson, Moran, 1995) was used to measure maternal sensitivity. It is a collection of 90 cards describing various scenarios/statements related to maternal sensitivity. These cards are sorted into groupings numbered from 1-9 (1-most unlike the mother, 9- most like the mother), by trained observer(s), on whether or not the scenarios/statements described on the card is characteristic of the observed mother. The scores collected from the observations are then correlated against a set of averaged criterion scores based upon the theoretical “most sensitive” mother and determined how sensitive the mother was to her child’s needs.

### *Brief Infant and Toddler Social and Emotional Assessment*

The Brief Infant and Toddler Social and Emotional Assessment (BITSEA) (Briggs-Gowan, 2004) is an evaluation for social-emotional behavioral problems and delays in competency. The 42-item questionnaire is to be filled out by the child’s parent/caregiver to assess the child’s behavioral problems, competencies and/or delays, if such occur.

## **Results**

The statistical analyses used for this study were run using the computer program, SPSS. For each variable identified separate analysis were run. For prematurity, correlations of prematurity (GA at birth) were run in regards to outcome assessments. For poverty, a one-way analysis of variance (ANOVA) comparing parents living in poverty versus parents not living in poverty was conducted. For parenting, correlations and ANOVA examining links between prematurity, poverty, and parenting were run. In addition, a final set of mediation analyses examining whether parenting mediates any links between prematurity and poverty and infant developmental outcomes. Each research question will be addressed separately.

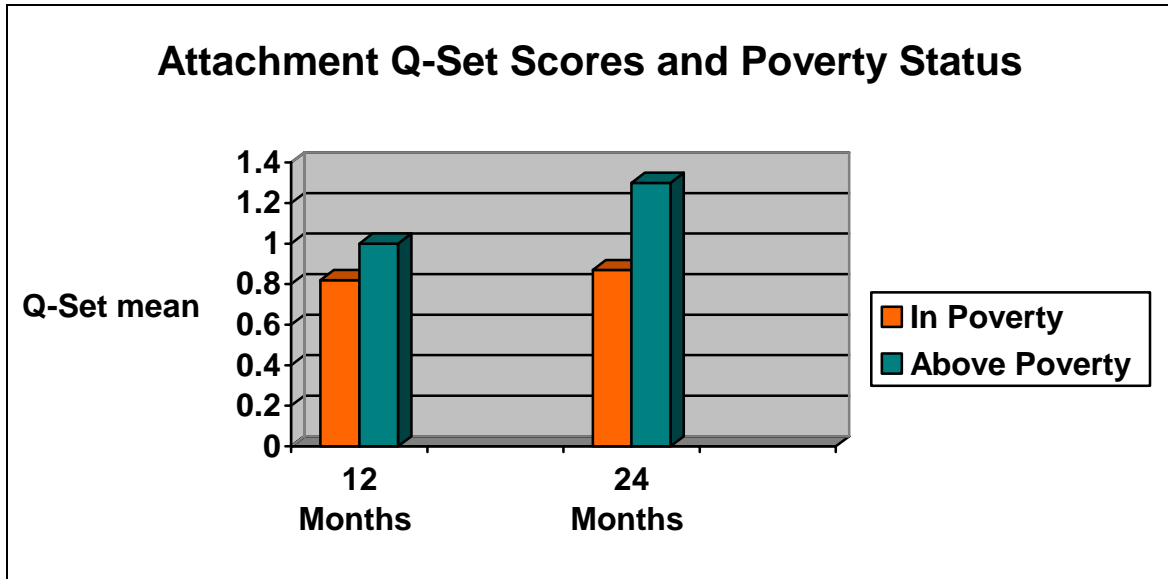
### *Research Question #1 (restated):*

*Are there any direct effects of prematurity and poverty on socio-emotional development among African American premature infants in low-income families?*

When the relationship between prematurity and socio-emotional development was examined it was found that gestational age had no association between either infant-mother security of attachment or infant behavioral problems and behavioral competencies at 12 and 24 months. On the other hand, poverty status and security of attachment were

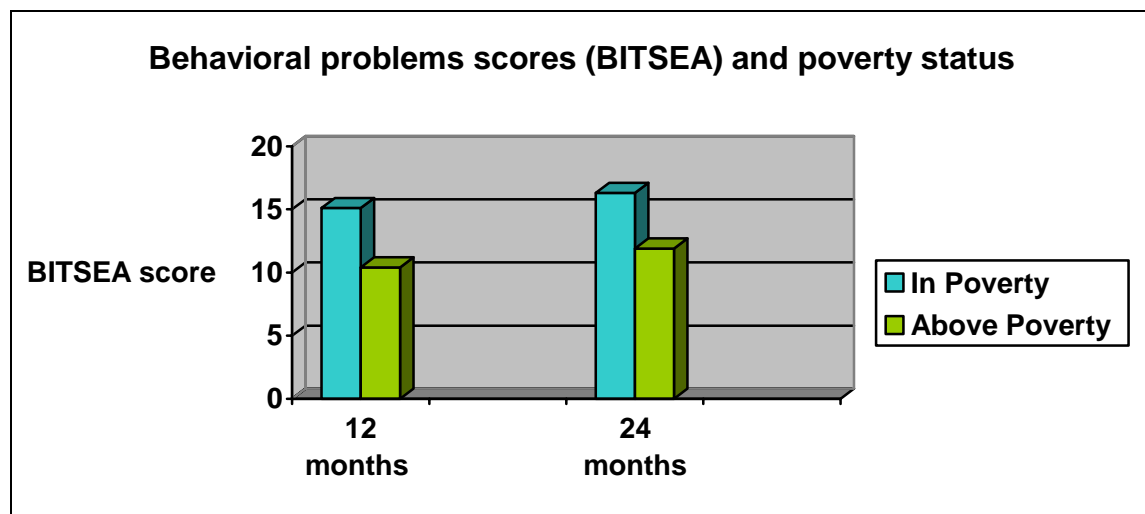
significantly associated; for families living below poverty thresholds, infant-mother attachment at 12 months ( $p < .05$ ) and 24 months ( $p < .01$ ) were not as secure as infant-mother attachment for dyads living above poverty thresholds. (See Figure 1)

**Figure 1.**



Behavioral problems were also significantly higher among children living below poverty thresholds at 12 months ( $p < .00$ ) and at 24 months ( $p < .05$ ). (See Figure 2)

**Figure 2.**

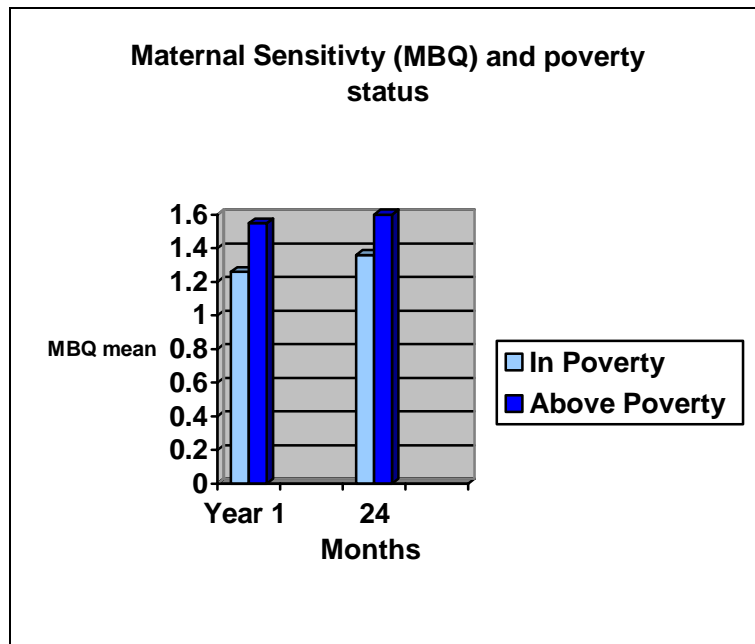


*Research Question #2 (restated):*

*Are the effects of prematurity and poverty indirect, via their direct effects on parenting?*  
*To what degree does parenting matter in predicting socio-emotional outcomes in these infants?*

Analyses revealed that there was no relationship between prematurity and these outcomes. Poverty did indeed seem to affect outcomes. Maternal sensitivity scores at four and twelve months were found to be highly correlated (Pearson  $r(127) = .54, p < .001$ ). Due to the high correlation the scores from months four and twelve were averaged together to create the Year 1 maternal sensitivity score. It was found that maternal sensitivity was significantly associated with poverty status. (See Figure 3.)

**Figure 3.**



Year 1 maternal sensitivity was significantly associated with infant-mother attachment security at 12 and 24 months and with infant behavior problems at 12 months, but not with infant behavioral competencies. (See Table 1.)

**Table 1.**

<b><u>Correlations between Year 1 Maternal Sensitivity, Infant attachment security and Behavior problems at 12 and 24 months</u></b>				
	<u>Attachment security</u>		<u>Behavior Problems</u>	
	12 mos.	24 mos.	12 mos.	24 mos.
Maternal Sensitivity	.65***	.44***	-.19*	-.08
*** Significant at $p < .001$			*significant at $p < .05$	

24-month maternal sensitivity was significantly associated with infant-mother attachment security at 24 months, but not with infant behavior problems or behavioral competencies. (See Table 2.)

**Table 2.**

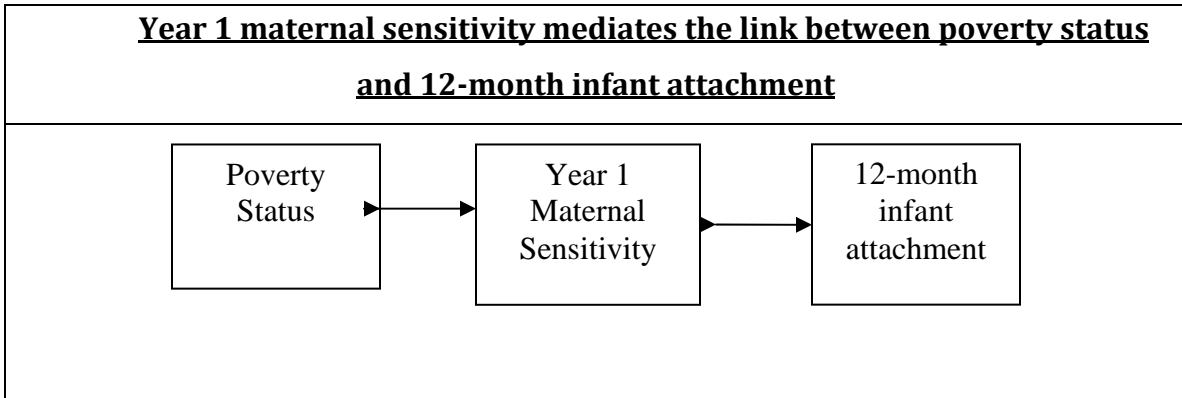
<b><u>Correlations between Year 2 maternal sensitivity and infant attachment security and behavior problems at 24 months</u></b>	
	Attachment security
	24 mos.
Maternal Sensitivity	.67***
*** Significant at $p < .001$	

Mediation Analyses

As previously indicated, poverty status, year 1 maternal sensitivity, and 12-month infant-mother attachment security were all intercorrelated. Thus, analyses were conducted to test the hypothesis that links between poverty and infant attachment security was mediated by maternal sensitivity.

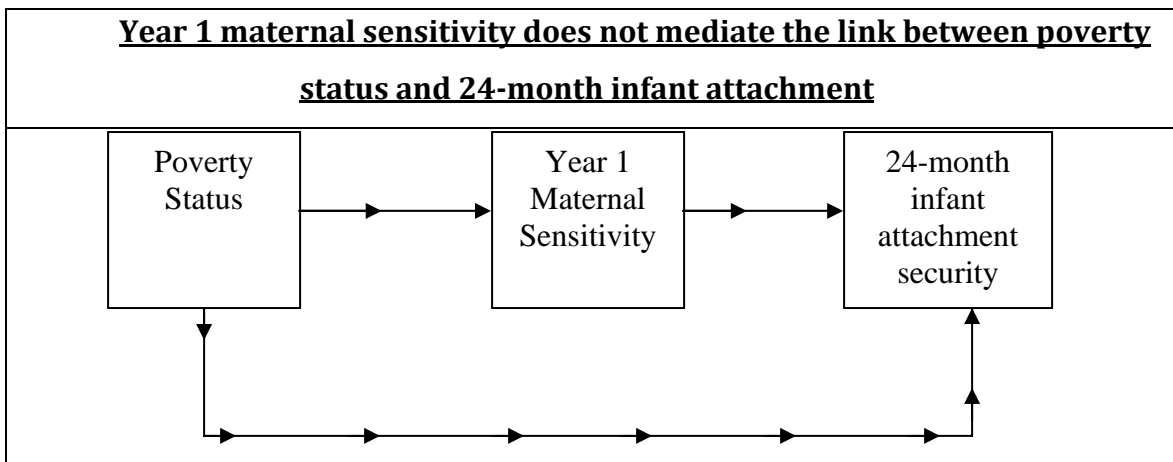
These analyses followed recommendations by Baron and Kenny (1986) for testing mediation. Partial correlations were conducted, statistically controlling for maternal sensitivity, to determine if the association between poverty status and infant attachment security at 12 months remained significant. If, after statistically controlling for maternal sensitivity, the relation between poverty status and infant attachment security dropped to non-significance, it is likely that maternal sensitivity mediates the link between poverty and infant attachment security. If the link between poverty and infant attachment security remained significant, it means that poverty continued to influence infant attachment security independent of mother's behavior. A partial correlation, statistically controlling for maternal sensitivity, revealed that the link between poverty and 12-month infant attachment security was no longer significant. Thus, maternal sensitivity likely mediated the link between poverty status and 12-month infant attachment security (see Figure 4)

**Figure 4.**



Another set of analyses were conducted to test the hypothesis that links between poverty and 24-month infant attachment security were mediated by maternal sensitivity. This analysis, however, did not support year 1 maternal sensitivity as a mediator. Poverty status continued to be significantly associated with infant attachment security at 24 months, even after statistically controlling for year 1 maternal sensitivity. (See Figure 5.)

**Figure 5.**



A similar mediation analyses found no support for Year 1 maternal sensitivity as a mediator of the link between poverty status and 12-month infant behavior problems. Another analyses looking at 24-month maternal sensitivity as a mediation of the link between poverty and 24-month infant attachment security, also found no support for maternal sensitivity as a mediator.

*Research Question #3 (restated):*

*If parenting does matter, what predicts individual differences of parenting in poverty?*

It was found that gestational age at birth affected parenting differences. The later



the child was born the more sensitive the mother was found to be. Another factor found to influence parenting was the presence of maternal depression. The more depressed the mother was the less sensitive she was to her child.

### **Discussion**

Within this study, we have found that prematurity status did not seem to matter in predicting infant socio-emotional outcomes. Poverty status, on the other hand, did. This was proven true when maternal sensitivity did indeed act as a mediator between poverty and 12-month infant security of attachment but did not mediate this link when it came to 24-month infant security of attachment. By the time children reach two years of age, even though maternal sensitivity remained significantly associated with attachment security, poverty may continue to have an impact on children's attachment security because even very good mothers may not be "good enough" to meet the basic needs of their infants. Evans (2004) states that "although the surroundings of low-income children contain more singular psychosocial and physical environmental risk factors with known adverse developmental outcomes, the confluence of multiple psychosocial and physical risk factors may be a key, unique feature of childhood poverty." ( p.86) Evans is indicating the point we have just mentioned. No matter how good of a parent one may be the buildup of adverse situations and negative life events is a very difficult obstacle to triumph over. In addition, at 24-months, children are more cognitively aware of their surroundings and may become conscious of what is lacking in their environment.

The results that have been discussed in this study about maternal sensitivity and infant attachment security are consistent with many other studies in the field of attachment. Some notable works are that of Ainsworth (1979) , Coppola et al., (2007) and McElwain et al., (2006) to just name a few. These authors all analyze and discuss how maternal sensitivity and interactions with her child influences the quality and security of the attachment.

Poverty was also associated with increased behavioral problems at 12 and 24 months but not with behavioral competencies. Maternal sensitivity was also discovered to be greatly affected by the family's poverty status. Mothers in poverty were found to be less sensitive to their child's needs. Mothers may be less sensitive because they are preoccupied with finding the means to provide their family with the necessities and dealing with all of the other negative life experiences that they may be encountering. Certain aspects of life also influence parenting. Several bodies of work support this claim, McLoyd (1998) states that "overwhelming evidence exists that these parenting behaviors stem partly from an overabundance of negative life events and conditions that confront poor adults." (p.196) within the context of poverty, prematurity and maternal depression were each associated with mothers' behavior. Others have found similar results; Lovejoy (2000) analyzed depressed mothers and their interactions with their children. It was found that the association with positive maternal behavior was weak, for mothers with depression, but was strongly associated with negative maternal behavior. Another factor that influenced individual differences among parents in poverty was the gestational at birth of the infant. The later the gestational age of the infant the more sensitive, the mother was found to be to her child.

There are many intervention programs aimed to demonstrate how to be a good parent, to promote parental sensitivity and so on, but the parents in poverty need more. Interventions should focus as much on meeting basic needs as on promoting parenting. Parents in poverty need the guidance and assistance to acquire the skills and resources needed to ensure that their families will be provided with the necessities. Halpern (1990) states that:

“The model that increasingly seems necessary for young families is one that provides a flexible mix of concrete, clinical, and supportive services in a nonbureaucratic, family-like context. It has to be a model that can work simultaneously and comfortably at multiple levels: from the immediacy of getting the heat back on in an unheated apartment to the gradual building of trust in a young adult whose life has been marked by a series of losses.” (p. 15)

Scholars, such as Ramey et al, (1995), state that providing a concentrated intervention program, for families in poverty, primarily on gearing parents to become self-sufficient is not a good approach for improving child’s development. In order for these interventions to be successful the program must (1) provide opportunities to explore and gather relevant and necessary information, (2) provide mentoring for the newly acquired skills, (3) celebrate each developmental achievement, (4) the review and rehearsal of the new skills and newly gained knowledge, (5) avoiding inappropriate punishment and ridicule, and (6) providing language supports for the individual. After these needs are met then the parental sensitivity promoting interventions will see greater results. In order for the parents to be ready and able to take on future endeavors with success, past and present troubles and obstacles must be addressed.

Many speak of the interventions aimed at and created for the parents, but one must not forget how crucial an intervention, which is well designed and executed, can be to the development of a child. Programs, such as Head Start, are good but the effects are not long lasting and may not be good enough. Zigler (1994) proposes new plans for future action:

“The net result of all of these efforts has been to shape a new approach to early intervention that embraces the consecutive stages of child development. We have come to realize that a year or two of preschool cannot turn children into geniuses or forever free them from poverty. Instead, we must give a long-term commitment to at-risk children throughout their growing years. The time between birth and age 3 is a period of rapid growth that lays the physical and socioemotional foundations for all later development, including the capacity to benefit from preschool.” ( p. 41)

Other beneficial types of interventions are ones that help promote and maintain secure attachment between mother/parent and child, these interventions provide the parents with information and exercises that they can apply when they are interacting with their child. Many offer helpful tips and services to help alleviate different stressors that may be effecting or hindering the development and preservation of the infant-mother

attachment. If these intervention programs are implemented, at an earlier time and for lengthier periods of time, then the effects of poverty may be curbed and many more children in poverty will have a better fighting chance for their future.

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### Bibliography

- Ainsworth, M. S. (1979). Infant-mother attachment. *American Psychologist*, 34(10), 932-937.
- Aylward, G. P. (2005). Neurodevelopmental outcomes of infants born prematurely. *Developmental and Behavioral Pediatrics*, 26(6), 427-440.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.
- Bartlett, R., Holditch-Davis, D., Belyea, M., Halpern, C. T., & Beeber, L. (2006). Risk and protection in the development of problem behaviors in adolescents. *Research in Nursing & Health*, 29(6), 607-621.
- Briggs-Gowan, M. J., Carter, A. S., Irwin, J. R., Wachtel, K., & Cicchetti, D. V. (2004). The brief infant-toddler social and emotional assessment: Screening for social-emotional problems and delays in competence. *Journal of Pediatric Psychology*, 29(2), 143-155.
- Brooks-Gunn, J., & Duncan, G. J. (1997). The effects of poverty on children. *The Future of Children*, 7(2), 55-71.
- Coppola, G., Cassibba, R., & Costantini, A. (2007). What can make the difference? Premature birth and maternal sensitivity at 3 months of age: The role of attachment organization, traumatic reaction and baby's medical risk. *Infant Behavior & Development*, 30(4), 679-684.
- Evans, G. W. (2004). The environment of child poverty. *American Psychologist*, 59(2), 77-92.
- Halpern, R. (1990). Poverty and early childhood parenting: Toward a framework for intervention. *American Journal of Orthopsychiatry*, 60(1), 6-18.
- Lamb, M. E. (Ed.). (1999). *Parenting and child development in "nontraditional" families*. Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.
- Lovejoy, M. C., Graczyk, P. A., O'Hare, E., & Neuman, G. (2000). Maternal depression and parenting behavior: A meta-analytic review. *Clinical Psychology Review*, 20(5), 561-592.
- McElwain, N. L., & Booth-LaForce, C. (2006). Maternal sensitivity to infant distress and nondistress as predictors of infant-mother attachment security. *Journal of Family Psychology*, 20(2), 247-255.
- McLoyd, V. C. (1998). Socioeconomic disadvantage and child development. *American*

- Psychologist*, 53(2), 185-204.
- National Center for Health Statistics. (2005). *Births Final Data for 2003*. National Vital Statistics Report, volume 54, number 2. Retrieved May 23, 2008 from, [http://search.marchofdimes.com/cgi-bin/MsmGo.exe?grab\\_id=6&page\\_id=3277568&query=prematurity&hiword=PREMATURE+PREMATURELY+PREMATURES+PREMATURLY+prematurity+](http://search.marchofdimes.com/cgi-bin/MsmGo.exe?grab_id=6&page_id=3277568&query=prematurity&hiword=PREMATURE+PREMATURELY+PREMATURES+PREMATURLY+prematurity+)
- Pederson, D. R., & Moran, G. (1995a). Appendix B: Maternal Behavior Qset. In E. Waters, B. E. Vaughn, G. Posada, & K. Kondo-Ikemura (Eds.), *Caregiving, cultural, and cognitive perspectives on secure-base behavior and working models: New growing points of attachment theory and research. Monographs of the Society for Research in Child Development*, 60 (pp. 247-254). (Nos. 2-3, Serial No. 244).
- Ramey, C. T., Ramey, S. L., Gaines, K. R., & Blair, C. (1995). *Two-generation early intervention programs: A child development perspective*. Westport, CT, US: Ablex Publishing.
- Singer, L. T., Fulton, S., Davillier, M., Koshy, D., Salvator, A., & Baley, J. E. (2003). Effects of infant risk status and maternal psychological distress on maternal-infant interactions during the first year of life. *Journal of Developmental & Behavioral Pediatrics*, 24(4), 233-241.
- Teti, D. M., O'Connell, M. A., & Reiner, C. D. (1996). Parenting sensitivity, parental depression and child health: The mediational role of parental self-efficacy. *Early Development & Parenting*, 5(4), 237-250.
- Teti, D. M., Sakin, J. W., Kucera, E., & Corns, K. M. (1996). And baby makes four: Predictors of attachment security among preschool-age firstborns during the transition to siblinghood. *Child Development*, 67(2), 579-596.
- Teti, D.M., & O'Connell, M. (2006). *Predicting Maternal Sensitivity in an Urban, African American Sample*. Presented at the World Association for Infant Mental Health, Paris, France
- U.S. Bureau of the Census, Current Population Survey, Annual Social and Economic Supplements. Poverty and Health Statistics Branch/HHES Division U.S. Census. Retrieved May 27, 2008 from, <http://www.census.gov/hhes/www/poverty/hstpov/hstpov22.html>
- Waters, E. (1995). Appendix A: The Attachment Qset (Version 3.0). In E. Waters, B. E. Vaughn, G. Posada, & K. Kondo-Ikemura (Eds.), *Caregiving, cultural, and cognitive perspectives on secure-base behavior and working models: New growing points of attachment theory and research. Monographs of the Society for Research in Child Development*, 60. (pp. 234-246) (Nos. 2-3, Serial No. 244)
- Yates, T. M., Egeland, B., & Sroufe, L. A. (2003). *Rethinking resilience: A developmental process perspective*. New York, NY, US: Cambridge University Press.
- Zigler, E. (1994). Reshaping early childhood intervention to be a more effective weapon against poverty. *American Journal of Community Psychology*, 22(1), 37-47.