LeCroy & Milligan
ASSOCIATES, INC.

Healthy Families Arizona Longitudinal Evaluation

1st Annual Report

HEALTHY FAMILIES ARIZONA

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Executive Summary

More convincingly than in the past, research suggests that the effects of child maltreatment are immense, and can follow children throughout their lives (Felitti, 2004). Regardless of the severity, child maltreatment poses serious risks to the immediate and long-term physical and psychological health of children. Furthermore, the financial costs associated with child abuse and neglect are enormous, costing an estimated $56 billion annually (Cicchetti, 2004). There is no uncertainty that child maltreatment is a dire problem that exerts a major toll on its victims, affected families, and society – therefore, prevention is key.

Many of the programs developed to prevent child abuse and neglect in the past three decades involve home visitation. As of December 2004 there were an estimated 430 Healthy Families America-type sites in 36 different states and Washington DC serving an estimated 47,500 families (Diaz, Oshana, & Harding, 2004). The budget for these programs was $232 million, a substantial investment in the prevention of child abuse and neglect and the healthy development of children. The rapid expansion of home visitation and its associated costs has focused attention on the effectiveness of this strategy. To date, the evidence of effectiveness on home visitation has been mixed (e.g., Duggan et al., 2000, Kitzman et al., 1997, Larson, 1980; Gray et al., 1979; Barth, 1991; Siegel et al, 1991). The purpose of this report is to outline the planning for the longitudinal controlled evaluation of Healthy Families Arizona. The Healthy Families Arizona longitudinal evaluation is designed to:

1. provide evidence of the program's effectiveness;
2. examine program impacts on parents and children over a five-year period to determine if any early differences between those receiving the Healthy Families Arizona program and those not receiving the program are maintained;
3. examine the critical elements related to success, e.g., study the variation in outcomes based on mother and child characteristics, client/worker relationship, and site characteristics; and
4. examine the cost of offering the program to families over a 5-year period.

The Healthy Families Arizona longitudinal evaluation will follow the same families over five years. This covers the period in which children are the most vulnerable to child abuse and neglect and allows for an assessment of school readiness as children approach kindergarten. It will compare a group of 95 families receiving Healthy Families Arizona to a group of 95 families not receiving the program (the control group). The analysis will track changes within the families and compare across the two groups over time.

The longitudinal evaluation of Healthy Families Arizona differs from the ongoing evaluation that has been conducted annually since 1991 in three important ways:

1. The evaluation is long-term – it follows the same families for five years regardless of whether or not they remain enrolled in the program. This is different from the ongoing annual evaluation of Healthy Families Arizona that does not follow families once they leave the program.
2. The evaluation uses a randomized control group as opposed to a comparison group as a means to determine program effectiveness. Random assignment to the control group and the intervention group, the Healthy Families Arizona program, allows for the assumption that the groups are equivalent prior to entry into the program. The ongoing evaluation cannot provide insight into whether or not the outcome would have been any different in the absence of Healthy Families Arizona.
3. The longitudinal evaluation employs additional measures that are not currently used in the ongoing evaluation. The purpose of these additional measures is to test a full-range of potential program risk and protective factors and outcomes. For example, domestic violence, substance abuse, mental health, and parental discipline of children will be measured systematically.

The Role of Evaluation in Healthy Families Arizona

Evaluation plays two important roles with regard to Healthy Families Arizona. First is a formative role. Since the inception of the Healthy Families Arizona program in 1991; evaluation has been used to provide timely and relevant information to be used in a quality improvement process. The second role of evaluation is an important summative role in which evaluation is used to determine overall effectiveness and accountability.

The state of Arizona has long been committed to a process of program improvement driven by the information gained through the ongoing formative evaluation of Healthy Families Arizona. Since the inception of Healthy Families Arizona in 1991, LeCroy & Milligan Associates, Inc. has conducted an annual evaluation of Healthy Families Arizona that is summarized in a report to the state at the end of each calendar year. Throughout the history of Healthy Families Arizona, the information generated through evaluation has been used in conjunction with quality assurance and training to ensure that the program is achieving its goals and producing the expected outcomes.

Early in the life of the evaluation it was recognized that the sites needed information beyond the aggregation of data that was presented in the annual evaluations. The initial response to this realization was to provide site-specific information in the appendices of the annual reports. In an effort to respond to the sites in a timelier manner, and to make the data useable for quality assurance visits and technical assistance to the sites, LeCroy & Milligan Associates, Inc. moved to providing site-level data on a quarterly basis. Since 1999, quarterly evaluation reports to the sites provide immediate feedback to ensure that processes that are not working well and outcomes that are less than expected receive immediate attention. Program specialists from the quality assurance team conduct a minimum of two visits to each site per year to provide follow-up on concerns highlighted in the quarterly evaluation reports. Problem areas identified through the quarterly reports are also followed-up by targeted training and technical assistance.

The evaluators have worked closely with the quality assurance and training staff to ensure that the site-level evaluation findings are useful to the sites and are used to influence practice. For instance, the reports include information on a range of process issues including the percentage of assessments completed, compliance with the required number of home visits and supervision standards, and worker retention and training. The reasons eligible families provide for declining the program are tracked and the sites receive quarterly data on acceptance rates that can be used in program improvement. The focus of the quarterly reports change from time to time as new problem areas are identified and new practices are

implemented. For instance, the most recent quarterly evaluation report tracks the enrollment of prenatal participants, a new component of Healthy Families Arizona implemented in 2004.

There is plenty of evidence to suggest from the controlled evaluation of other home visitation programs that in the absence of a quality improvement process informed by evaluation, i.e., the formative evaluation role, services will not be of sufficient quality, intensity, and fidelity to lead to the desired benefits for children and families (see for example Duggan et al., 2004). Summative evaluation methods such as this controlled longitudinal evaluation should not be attempted until it is demonstrated through formative evaluation that the program is being implemented as planned, that there is sufficient attention to process, and that the program demonstrates the promise of effectiveness. Only then is it worthwhile to spend the time, effort, and money on summative evaluation.

The longitudinal evaluation of Healthy Families Arizona marks a commitment to embark on the summative evaluation function. What state legislators, funders, advocates, and program personnel want from the evaluation is evidence of effectiveness. This is the purpose of the controlled longitudinal evaluation of Healthy Families Arizona.

Planning for the Longitudinal Evaluation

The evaluators have spent a full year planning and preparing the Healthy Families Arizona program for the longitudinal evaluation. The planning and preparation was centered around four sub-studies:

(1) a literature review on the theory and research related to the goals of Healthy Families Arizona;

(2) an exploratory study of the long-term outcomes of Healthy Families Arizona as perceived by the staff, supervisors, and participants of the program;

(3) an examination of the program structure and logic model of the program; and

(4) a retrospective study of factors related to substantiated incidents of child abuse and neglect for program participants from 1997 to 2004.

In addition to informing the specific roadmap for the Healthy Families Arizona longitudinal evaluation, these four sub-studies resulted in recommendations to strengthen the program in the areas of program development and training – assisting the program to prepare for the controlled longitudinal evaluation.

Recommendations

From 1997 through 2004 there were 305 families with substantiated reports of child abuse and neglect, 5,092 families with no CPS involvement, and another 754 families with unsubstantiated CPS reports. In some way, this proportionately small group of 305 families with substantiated CPS reports represents the failure of Healthy Families Arizona, and there is much to be learned from them. Nine factors were identified as significant predictors of substantiated child abuse and neglect in the retrospective study of Healthy Families Arizona participants. These nine factors can be used to identify children who are at increased risk. These factors also have implications for training and supervision. It is important that assessment tools, program activities, and referrals address the factors that are related to child abuse and neglect and that are amenable to change. Of the nine factors that were statistically significant predictors of substantiated child abuse and neglect, six are amenable to change including: substance abuse, isolation that results from living alone, reconciliation of issues related to a childhood history of abuse and neglect, potential for violence, an acceptance of discipline strategies that include spanking, and shouting, and the lack of a secure attachment to the child. The odds of child abuse and neglect are about 54% greater for mothers who report difficulty attaching with their child, and 66% greater for mothers with histories of abuse in their own childhoods than those without such histories.

The recommendations that result from the retrospective study of Healthy Families Arizona participants are consistent with the recommendations resulting from the exploratory study. For instance, the Family Support Specialists reported needing additional support and information in the areas of:

- nonviolent discipline in a cultural context where spanking and yelling are commonly accepted. The Family Support Specialists need tools they can give parents to work with extended family in the area of discipline.
- strategies for stress reduction with parents;

- involving fathers and promoting father involvement when the family environment is less than supportive. Interestingly, the retrospective study showed that CPS involvement, including unsubstantiated and substantiated reports are more likely to occur when the father is unemployed. The Family Support Specialists might engage fathers in working on life course goals, much the same way that they have had success in working with Healthy Families mothers.

Parents also indicated several areas of the parent/Family Support Specialist (FSS) relationship that should continue to be addressed. These include:

- Staff retention: parents find it difficult to transition to new Family Support Specialists and reportedly feel like they are starting over and have to tell their story all over again. Easing transitions when an FSS terminates their work with a family and a new staff takes her place are important to the participant's continued engagement in the program.
- Just as endings are important to the Healthy Families participant, so are beginnings. The comments of the participants interviewed for the exploratory study suggest that the explanation of Healthy Families Arizona at the time of recruitment should address why the parent is being recruited. Some parents reported speculating about the reasons they were recruited to the program. For example, they reportedly wondered if the reasons they were offered the program were because they were on AHCCCS, young, or because someone thought they were going to be a bad parent. This suggests that there is stigma associated with the program. The parents suggested that it would be helpful if public awareness of the Healthy Families Arizona program was increased to reduce the stigma that some women feel as a result of being recruited by Healthy Families Arizona. Parents also suggested that broader awareness would increase accessibility to the program for other parents who could potentially benefit.
- The hiring of new Family Support Specialists should consider what Healthy Families Arizona parents describe as experience. Parents appreciate Family Support Specialists with direct hands-on experience versus "book smart" experience.
- Hiring should target increasing the pool of bilingual Family Support Specialists.

- Family Support Specialists need to be continually reminded about the importance to families of punctuality and keeping appointments. Not only do they inconvenience and disappoint families when they are late or do not show for appointments, but they are modeling important behaviors. When necessary, parents need to be informed of canceled appointments and appointments need to be rescheduled.

Significance of the Healthy Families Arizona Longitudinal Evaluation

The longitudinal evaluation is highly significant, especially since Healthy Families Arizona has grown in size and cost. The Governor's office, state legislators, and child advocates are calling for evidence of program accountability. Second, other controlled studies of home visitation, although few in number, have produced mixed results and some have been damaging to the reputation of the Healthy Families program model. This has put pressure on Healthy Families programs across the nation to demonstrate program effectiveness. Arizona has long been recognized as a leader in the Healthy Families model of home visitation. Therefore, the outcome of this evaluation has national, as well as local significance.

Introduction to Planning the Healthy Families Arizona Longitudinal Evaluation

The 2005 fiscal year has been a year of planning and start-up for the longitudinal evaluation of Healthy Families Arizona. The approach to the evaluation can be described as a layered-study approach including four substudies. These four studies are outlined below.

Theory of Change. This substudy summarizes the theory and empirical evidence related to the three major goals of the Healthy Families Arizona program: (1) the prevention of child abuse and neglect, (2) the enhancement of parent/child interaction, and (3) the promotion of child health and development. The significance of this substudy is that it is unreasonable to expect change if the Healthy Families Arizona program is not working to affect change in the major risk and protective factors related to the program goals.

Exploratory Study of Healthy Families Arizona Long-term Outcomes. An exploratory study that included a survey of 18 established Healthy Families Arizona sites and interviews with 16 current and former Healthy Families Arizona participants was conducted to identify perceptions of long-term impacts beyond those identified in the literature on home visitation. This study was conducted with the intent of informing the range of outcome measures to fully test the boundary of the Healthy Families Arizona program.

Retrospective Study on Child Maltreatment. This substudy examines eight years of data collected on all Healthy Families Arizona program participants from 1997 through 2004. Child abuse data collected prior to 1997 were not available for analysis. The total Healthy Families Arizona target child and dependent sibling database was run against the Department of Economic Security (DES)-Child Protective Services (CPS) CHILDS database to identify families with substantiated incidents and unsubstantiated reports of child abuse and neglect. The statistical analysis for this substudy allowed a determination of the factors predictive of substantiated child abuse and neglect in the Healthy Families Arizona population.

Critical Examination of the Program Logic Model. A program logic model is an articulated description of the program goal, objectives, activities, measurements, and resources. It outlines the program's operations in terms of administration, personnel, training and supervision practices, and the major decision points in the course of participation in the program. The concurrent examination of program theory and conceptualization of the

Healthy Families Arizona program as represented by the program logic model helped promote an ongoing discussion on program improvement in a critical and guided manner. The critical examination of the program logic model served two purposes. The first was to help the program look critically at implementation issues prior to engaging in the outcome evaluation. For instance, did the program objectives address the salient risk and protective factors identified in the examination of program theory? Second, was the program logic model an accurate representation of the program and was it front and center in guiding decision-making related to the program? It is important that the program logic model be both of these things as it will be used as a basis for measuring program fidelity in the longitudinal evaluation, i.e., measuring if the program was implemented as intended. LeCroy & Milligan Associates, Inc. conducted activities throughout the planning year to promote the use of the program logic model as a basis for understanding the program and as a guide in decision-making.

Program Theory and Research

The causes of child abuse and neglect are complex. Most theories of child maltreatment recognize that the root causes can be organized into a framework of four principal systems: 1) the individual parent and child, 2) the family, 3) the community, and 4) the larger societal system or macrosystem. Within each of these four systems numerous factors have been found to increase a child's risk for maltreatment while other factors have been found to protect against maltreatment. Researchers studying the etiology and effects of child maltreatment argue for a simultaneous study of multiple risk and protective factors, suggesting that it is more than just one factor that makes certain segments of the population more likely to report child abuse histories or experiences (Belsky, 1993; Brown et al., 1998; Cicchetti & Lynch, 1993).

Studies have found that as the number of risk factors for maltreatment increases, a child's likelihood for abuse and neglect also increases (Brown et al., 1998). For instance, Brown et al., (1998) discovered that the prevalence of child abuse or neglect increased 3% when no risk factors were present to 24% when four or more risk factors were present. This finding suggests that in order to effectively identify children who are at a greater risk for child maltreatment, and consequently developmental difficulties, a significant number of risk factors need to be considered and addressed. Given these findings, researchers and practitioners need to consider the multitude of personal, family, and environmental factors that strengthen families, reduce the risk of abuse and neglect within families, and improve child outcomes. Table 1 presents the risk and protective factors, as well as the consequences of child maltreatment identified in the literature. These items should be considered for inclusion in the longitudinal evaluation. The full literature review is presented in Appendix A.

Table 1. Risk and Protective Factors Identified in the Literature

Individual Child	Family	Community	Larger Society
<u>Prenatal Period</u> • genetic endowment • stress in pregnancy • exposure to violence in pregnancy • nutritional deficiency • infectious disease (STD, etc.) • neurotoxins (alcohol, drugs, tobacco) • prenatal care <u>Birth and beyond</u> • premature birth • low birth weight • stimulation/play • routines for basic care • nutrition • sleep and rest • health care • sense of security • age • gender • disability • intelligence • easy temperament • consistent and preventive medical care (immunization) **Individual Parent** • personality • substance abuse • race/ethnicity • age • education • employment • history of childhood maltreatment • reconciliation with history of abuse • mental health (self-esteem, depression, social isolation, loneliness) • stress • anger • impulsivity • tendency to interpersonal conflict • age at birth of child • educational attainment • attachment to child • knowledge of child development • perception of child	• discipline strategies • income • household rules • supervision/monitoring • communication • flexible and adaptable to change • household size • number of children • family structure • domestic violence • chaotic home environment • parental absence • healthy relationships • family support • expectations of pro-social behaviors • participation in religious faith • adequate housing	• neighborhood poverty • parental perception of safety • availability of medical care • availability of social services • preventive medical care • economic opportunities • housing	• access to medical care • access to mental health and other social services • income support • child care • support for education/ employment

The literature also identifies the following outcomes associated with child maltreatment. Assessment of some of the outcomes would be based on the child's age. For example, relationship with peers and school readiness are measures geared to a 5 or 6 year old child.

Outcomes associated with child maltreatment	
• child fatality • sexual abuse • physical abuse • neglect • emotional abuse • developmental delay • behavior problems • social withdrawal • self-regulation • independence from parent • brain development • empathy • demonstration of compassion and love • toileting behavior	• need for special education • educational outcomes • literacy skills • learning • intellect • good peer relationships • plays well with others • follows simple directions and rules • ability to resolve conflict • concentration • speech • disabilities (FAS, FAE, etc.)

Exploratory Study of Perceived Healthy Families Arizona Long-Term Outcomes

An exploratory study to examine perceptions of the range of Healthy Families Arizona program effects and the long-term impacts of the program was conducted in the spring of 2005. The purpose of the exploratory study was to guide the design of the longitudinal evaluation. Two groups were surveyed for the exploratory study. First, Healthy Families Arizona staff including supervisors and Family Support Specialists (FSS) from the 24 established Healthy Families Arizona sites were requested to respond to a mailed survey. Of the 24 sites surveyed, Healthy Families Arizona supervisors and staff from 18 sites participated, representing a 75% response rate. Secondly, 16 current and former Healthy Families Arizona participants were recruited through referrals from the Healthy Families Arizona staff participating in the mailed survey.

Six of the participating Healthy Families Arizona sites referred participants including[1]: Central Phoenix, Sunnyslope, Nogales, Prescott, Lake Havasu, and Tucson. Sixteen Healthy Families Arizona participants, all mothers, were interviewed using a semi-structured interview guide. The interviews were approximately 30-45 minutes each and interviewees received $25 in appreciation for their time and information. Participation in the Healthy Families Arizona program for the 11 current participants ranged from 18 to 58 months with an average of 30 months. The five former Healthy Families Arizona participants had all graduated between June 2004 and March 2005 after completing five years in the program.

Recruitment to Healthy Families Arizona

The 16 participants were asked to think back to how they felt about starting the Healthy Families Arizona program and to describe their lives at that time. Five participants expressed "chaotic" or "hectic" home environments at the time they were recruited to Healthy Families Arizona; four other participants characterized their lives as "crazy" and reported feeling stressed, anxious and overwhelmed about raising their children. One mother noted she was

[1] A seventh site, Yuma, also referred participants for the study and attempts to make contact were not successful.

"*at a crazy point"* in her life stating: "*I didn't want to admit I needed help."* In addition to their own life stressors, several participants mentioned that their child was born with complications, or that they had experienced problems during childbirth. The mothers mentioned that they were especially nervous about their ability to parent; consequently, they reported feeling afraid and expressed the need to have someone to talk to. Only one of the 16 mothers interviewed noted that things in her life were "normal" at the time she was introduced to Healthy Families Arizona; yet she also reported feeling inexperienced and scared about caring for her child: "*My life was normal; I had a happy marriage. The only thing is I was really stressed because I didn't know how to care for a newborn. I was really scared."*

Four participants expressed the opinion that there is not enough awareness of Healthy Families Arizona and this may limit the program's ability to attract families who might otherwise need the program's services. "*I think it's wonderful and should be offered to more moms*." Another participant commented: *"I wished they advertised it more. Several people at my work haven't heard of it and for some it would've been helpful."*

Five mothers suggested that the approach to offering Healthy Families Arizona made them "nervous" and "unsure" about why they were being offered the program. For instance, one mother revealed: *"I didn't know if I was approached because I was on AHCCCS. Is it because I was poor? I wasn't sure."* Another mother noted, *"I thought they thought I was going to be a bad mother because I was young. I wasn't sure why they were asking me. I guess I was intimidated."* Another mother indicated: "*Having a nurse hand me a flyer made me feel nervous. I didn't know why I was being told about it.*" These mothers suggested that greater sensitivity and more information as to why they were being offered the program could help generate more interest in Healthy Families Arizona.

The majority of the 16 mothers noted that although they were unsure about what to expect from Healthy Families Arizona they were also excited about enrolling. For example, one mother stated: "*I was looking forward to learning about my baby and have someone there. I was excited."* Another participant noted that although she felt a bit "*naïve and nervous,"* she

also felt "*excited about learning new things*." The ability to enroll in a free program that provides help, support, information and services was a significant factor in the mothers' decisions to start and ultimately continue their involvement with Healthy Families Arizona.

Areas of Program Impact

There was a great deal of congruence in the responses of supervisors, staff, and participants as to the range of Healthy Families Arizona program effects and long-term impacts. The perceived program effects have been summarized into nine major themes. Each theme is described below and is illustrated with quotes from the survey.

They include:

- improving the parent/child relationship
- promoting child development
- increasing economic self-sufficiency
- preventing child abuse and neglect
- improving child health
- improving parent health and mental health
- promoting family stability
- increasing social support
- and improving parental competence.

Improving the Parent/Child Relationship

Healthy Families Arizona program staff noted attempts to promote healthy parent/child relationships, and increase attachment, parental empathy, and parental involvement with an emphasis on father involvement. The staff reported the perception that the program is generally effective in promoting healthy parent/child relationships due in large part to the number of activities and resources that Healthy Families Arizona provides to families in this area. These include, for example, encouragement, reinforcement, modeling, direct teaching, flexibility in scheduling so fathers can be involved, community referrals, handouts with relevant information, consistent contact, listening, supportive play, activities, floor time, the Individual Family Service Plan (IFSP), and the *Growing Great Kids* and *Everyday Matters* curriculums.

The one outcome that program personnel expressed the least confidence in influencing in this area was father involvement. Although several Healthy Families Arizona sites expressed support for this outcome, some reported that family members sometimes oppose father involvement.

Consistent with the comments from the Healthy Families Arizona staff, the 16 Healthy Families Arizona participants recognized the impact that the program had on their relationships with their children. Eight mothers suggested that Healthy Families Arizona focuses on enhancing communication within the family. For example, one mother said: *"They have taught me how to communicate with my daughter by singing, reading and talking to her."* These mothers felt such things as praise and patience helped establish a positive, stable home environment and good relationships with their children. Statements that reflect these sentiments include:

> "*I remember to praise my child. That's important. I try and remember that."*
>
> *"I'm a more patient parent."*
>
> "*The program shows parents that nothing should bother you. Children don't all learn at the same time and that's ok. They remind you that you have to be patient when raising a baby*."
>
> "*She [FSS] gives me information that I can apply to being a parent. And the activities, they're wonderful. I couldn't think of these things on my own. I think it has really improved communication with my child."*

Promoting Child Development

A second theme in the staff and participant responses was related to child development. This theme includes activities such as helping parents understand their babies, teaching parents about child development, demonstrating appropriate developmental expectations of children, and making community referrals. These activities were viewed by Healthy Families Arizona staff as a means for creating better outcomes in subsequent family births, and encouraging development consistent with the child's age. Program personnel felt that Healthy Families Arizona is generally effective in promoting child development outcomes in the long-term.

They also recognized that long-term demonstrations of appropriate developmental expectations of children were limited due to the lack of resources for families with children between 5 and 10 years of age.

The 16 Healthy Families Arizona participants spoke about child development with knowledge and confidence. Program participants recognized the promotion of healthy child development as a key focus of Healthy Families Arizona. This is reflected in the following quote*: "(Name of FSS) asks questions to see how she is developing. It helps to make sure my daughter is growing properly."* Mothers noted that one primary resource that Healthy Families Arizona uses to promote child development is the developmental questionnaire called *Ages and Stages*. For instance: *"The program helps me see how my baby is developing." "Kids change every year, it's nice to have tools for each stage."* The participants noted that the questionnaire provides an opportunity to understand key developmental milestones of their children as they move through the program.

Participants' comments reflected the perception that Healthy Families Arizona is influential in child development and they were overall satisfied with their knowledge and understanding of their child's development. For instance, one mother suggested that Healthy Families Arizona provides "*information on what you can expect from babies at developmental stages and age groups. You learn how to distinguish cries, and at what age your child should start crawling*." Similarly, another mother said the program would "*help me pay a lot of attention to my daughter, such as her development and how to treat her*." Another mother stated that she now had a "*better understanding of my child and I feel I am a better mother. The program helped me advance*."

Participants also noted the program's focus on identifying potential developmental delays. These mothers reported that the emphasis on delays led to early identification that might otherwise have been overlooked. For instance, one mother with older children stated: *"I have a 5-year-old son with developmental problems. Had I known about the program earlier, I think we could've caught his problems."* Mothers reported that delays were often identified in the areas of speech and language. Interestingly, mothers noted developmental

improvements among their children as the most common positive change in their child as a result of Healthy Families Arizona. These mothers mentioned that once the FSS identified developmental difficulties they were subsequently referred to appropriate community services and received extra attention during home visits. For instance, one mother said, "*His speech is improving because of the tools and reading we've been doing."* Consequently, these mothers viewed one of the primary goals of Healthy Families Arizona as providing developmental information and community resources to help identify and provide services for needed care. The information mothers receive from Healthy Families Arizona on development and developmental stages was frequently mentioned as one of the greatest strengths of this home visitation program. The goal of promoting child development was often mentioned as an initial expectation of the program's purpose and was reinforced throughout participation in the program.

In addition, five mothers emphasized the program's impact on enhancing their child's cognitive ability. For instance, one mother stated, "*He's intelligent. Our visitor brings me books so I can read to him*." Another mother noted, *"My daughter is very intelligent, not just because she's my daughter but because she has learned a lot from the program. For example, since they teach parents to read to their children, she [my FSS] always seems to bring me different books so I can read to her [my daughter]."*

Increasing Economic Self-Sufficiency

A third theme that surfaced in the survey of Healthy Families Arizona sites and participants was *economic self-sufficiency.* This theme is broad and includes such objectives as parents pursuing their educations, families receiving assistance with job training, employment, and finances and budgeting. Responses from the Healthy Families Arizona sites suggest the program is generally effective in meeting these outcomes, and yet staff experience problems encouraging some aspects of budgeting and economic self-sufficiency due to parent's limited job skills, life stressors, and an absence of community resources to address financial, education, and health issues.

Half of the Healthy Families Arizona participants also reported that the program was helpful in assisting them with finding appropriate resources in their communities and ultimately impacted their becoming self-sufficient. This included finding community services to assist them with their immediate financial and educational needs, as well as those that might help them in the future. Several participants noted major achievements such as:

"I am full time in school now."

"I own my own house and went and finished some school."

The participants also noted the relationship between economic self-sufficiency and family relationships. For example, one mother indicated the program helped her improve relations with her husband where they went from "*living on the street to owning their own home. I am now a better parent and a better wife*." Similarly, two mothers commented:

"I feel like I am a better parent and wife."

"*I am healthier, wealthier, and wise. I'm more well-rounded with income and budgets. The quality of life for my son is better."*

A special emphasis on "self" sufficiency was noted as is reflected in the following comment: "*I thought it would do for me. It doesn't. The program is out to help teach. Not do for you, but teach you."* Only one participant suggested that Healthy Families Arizona should directly provide her with resources: "*Another thing is if I need something, like diapers, they need to get it to us. They need to always have access to diapers and milk."*

Generally, as the mothers' self-sufficiency increased, they reported they relied upon and needed Healthy Families Arizona less. One mother stated, "*I have less visits now because I am not relying on it as much. I'm gaining my independence*." Another mother replied, "*I don't need as much help now so I don't see (*name of FSS*) as much."* These comments indicate that participants understand the level-system used by Healthy Families Arizona and support this practice.

Preventing Child Abuse and Neglect

The fourth theme, the prevention of child abuse and neglect, is an area that was alluded to in the three previous themes including parent/child relationships, child development, and economic self-sufficiency. Both Healthy Families Arizona staff and participants explicitly mentioned preventing child abuse and neglect as an area of program impact. For Healthy Families Arizona staff, this included promoting positive discipline through modeling and education, improving parenting skills, and decreasing parental stress. This was an area where Healthy Families Arizona staff mentioned two challenges to the attainment of positive program impact. First, some staff reported that the use of positive discipline methods is at times offset by the influence of extended family members and cultural practices. Second, it was stated that there is currently not enough information for parents on stress management. One site also reported that more should be done to help families avoid CPS involvement.

Two of the 16 Healthy Families Arizona participants reported the potential for the program to reduce child abuse. One mother noted this was especially likely among "*single moms who are already so stressed out about caring for their baby."* Another mother reported: "*If more families got involved, the state would see less child abuse and neglect*." Seven participants expressed the opinion that Healthy Families Arizona reduced parental stress by providing resources and referrals, parenting information, and support that helps enhance families ability to effectively care for their children. For instance, "*I would not be the parent I am now if it wasn't for Healthy Families. I am an advocate of Healthy Families. I believe it helps reduce abuse and ignorance about parenting. I would recommend it to all parents*."

Improving Child Health

The fifth area of program impact is child health, including healthy, immunized children living in safe home environments. Staff reported that the activities that lead to the attainment of these outcomes are teaching about infant and child care, educating families on child safety and nutrition, and encouraging routine immunization and medical care of children. Healthy Families Arizona staff reported the perception that the program was largely effective in this area. The outcome is reportedly hindered at times due to limited health resources and a lack of wellness checks among participating families.

Improving Parent Health and Mental Health

The sixth category is somewhat of a catchall for a number of outcomes related to parent health and mental health. These outcomes include decreasing domestic violence, substance use and abuse, and supporting identification and treatment of mental health problems. Noted program services that target these outcomes include domestic violence, substance abuse, and mental health screens; community referrals; collaboration with other programs; reinforcement and encouragement. Healthy Families Arizona personnel reported the perception that the program is able to meet these goals effectively. However, one site noted the difficulty with knowing whether parents discontinue their use of drugs and alcohol in the long-term as there is limited awareness of substance use among past program participants.

The participants did not mention program impacts in the areas of substance abuse and domestic violence. Two participants, however, reported that the program was able to help them deal with their disabilities.

> "*It's the best program I've been in and they did a good job, excellent job with me. I'm disabled and they did an excellent job with my kids. They did real good. Put an A down and a smiley face."*
>
> "*I'm really impressed and grateful for the way my FSS has helped me. I suffered a very serious car accident and am now disabled. My FSS has helped me in this area. She has given me advice and information on how to deal with it and how to explain to my son why and how I am disabled."*

Promoting Family Stability

Additional areas of program impact identified by staff included the parent's resolution of their own childhood issues, improved family communication, future family planning (e.g., discussions about future pregnancies), children becoming more independent, families advocating for themselves and others, families referring others to Healthy Families Arizona and providing resources to those who may need help with parenting issues, and decreased incarcerations of family members. Participants suggested that the emphasis on communication was focused on both the child, and, where applicable, a significant other, thus improving relationships with a spouse or partner.

Increasing Social Support

Many mothers reported a major purpose of Healthy Families Arizona is to provide "support" and "offer help and needed services" to families throughout the first few years of their child's life. This sentiment was particularly common among mothers who felt they were "alone" when they learned about the program and among those who were first time mothers. Mothers reported that the program, primarily the FSS, acts as a "crutch" by providing them with information, resources and referrals, and economic and emotional support. For instance, one mother felt the primary purpose of the program was to "*help young moms so they won't be stressed out.*" Another mother felt the program would "*give me someone to talk to."* These mothers felt it was important to have someone to turn to and "*be there when you need someone*." These sentiments indicate that the program acts as a form of support that these families may otherwise be lacking. Their comments in this area included:

*"She (*FSS*) counsels me on issues. Helps keep me sane."*

*"They are just always there. They help you with financial things, food boxes, just getting you on your feet. I can always call (*name of FSS*), tell her anything."*

*"This is my first child and I really didn't know what to expect. (*Name of FSS*) helped me understand."*

"As a first time parent, I have support."

Aside from the emotional and financial support and resources Healthy Families Arizona provides, participants discussed the program gatherings as another means of support and an opportunity for socializing with other families involved with Healthy Families Arizona. Similarly, these outings provide children with an opportunity to play and interact, which was mentioned as a positive change for many enrolled children. One mother remarked, *"They had a Christmas party. And they did this 'Dress a Child.' Families who can't afford nice things were able to get a nice outfit for their child. That really is important."* Similarly, one mother commented, *"I really like the gatherings they have with the Healthy Families Arizona clients. This is really good for my daughter so she can play with other kids. Sometimes we go to the pool. They also play music for the kids and this gives kids the opportunity to socialize with one another."*

Improving Parental Competence

Participants especially emphasized the program's ability to help them feel better about themselves, particularly improving their self-esteem, making their lives more "stable," and enhancing their confidence and ability to be a good parent. Several mothers mentioned that this was an emphasis of Healthy Families Arizona. For instance, one mother indicated she felt better about herself and stated she now had "*confidence in being a great mom even though I'm single*." Similarly, another mother suggested "*our life is more stable because I am learning how to take care of myself and my children."*

Participant Retention

In order to fully benefit from Healthy Families Arizona, participants have to remain in the program long enough to receive what they need from the program. Accordingly, we asked current and former participants why they remain(ed) involved as well as the strengths and limitations of the Healthy Families Arizona program. When asked the question, "What has kept you involved in Healthy Families Arizona?" the mother's comments included:

"They find ways to get you help where you need it."

"It's a good program. I receive a lot of help."

"Learning different things."

Aside from the help they receive, participants reported that the Family Support Specialists were one of the major strengths of Healthy Families Arizona and a primary reason they remain(ed) involved. While the services including developmental assessments, parenting information, and emotional and economic support helped induce initial interest in the program; it was the relationships with the Family Support Specialists that often influenced participants' to continue in the program. Participants generally reported the perception that their Family Support Specialists were "nice," "supportive," and "caring." The FSS was often noted as having a "positive influence" on mothers and how they parent, and many mothers indicated that they were "comfortable" with their FSS and "*respect their comments and feedback*."

For example,

> *"She calls often to see how my son is doing. She cares a lot about him and our family."*
>
> *"I feel fortunate to have her."*
>
> "*She helps me be a better mother because of the feedback she provides*."
>
> "*I didn't feel like a case*."
>
> *"The home workers… She comes and plays with my son. That is good for him and for me."*
>
> *"I have mommy brain. I can't remember when my daughter does things. I say, 'When did she do this?" (*Name of FSS*) has it recorded and knows."*
>
> *"She helps me a lot. She brings toys, books, and lots of things to do with my son. I learn a lot from the things she does with us."*

Despite the friendly, respectful characteristics of the Family Support Specialists, many mothers discussed the difficult process of building relationships. Participants reported that it often took a little time before establishing the rapport that allowed them to open up and trust their FSS. For example, one mother said she was "*more comfortable now than at the beginning of the program because I am now more comfortable with my worker*." Another mother echoed the sentiment of comfort with her FSS by stating, "*At first, it was awkward because we didn't really know each other, but after getting to know each other it has really helped*." Other examples of this sentiment include:

> "*I am more confident and trust her now. I'm not embarrassed anymore to talk to her*."
>
> *"I was worried about having someone in my home. But the more we met I became comfortable with her. I knew she was there to help me."*

These comments suggest that the relationship between the FSS and family is central to program effectiveness by promoting family and child well-being.

Staff Retention

Many mothers mentioned that a change in their relationship with their FSS had impacted their level of involvement in Healthy Families Arizona. Participants reported that their relationships with the Family Support Specialists also created some difficulties when they experienced more than one FSS throughout their involvement with Healthy Families Arizona. This was particularly true when a mother felt comfortable with a FSS who terminated her employment, leaving the family to build a new relationship with a new FSS. For instance, one mother responded: "*There was some inconsistency among the family workers. I think there is such a high turnover and it impacts our relationship. We've had a couple and it's hard to rebuild relationships and feel comfortable again. It takes time. And then they seem to leave.*"

Many mothers echoed this concern over the high turnover among Healthy Families Arizona Family Support Specialists. Five of the participants interviewed had between three and six Family Support Specialists. Participants mentioned this created a problem for them since it produced the need to readjust to a new relationship and get comfortable. For instance, one mother indicated she had "*several workers quit so I had trouble adjusting to each one. I've had this one for a while now so I'm more comfortable with her.*" Similarly, three mothers felt there was a little "setback" when they had a new FSS. For instance, *"It seemed like we started all over again. She didn't know where we left off or what I had shared, so we basically started over."*

Characteristics of the FSS

Four participants discussed the experience level of the Family Support Specialists as a limitation of Healthy Families Arizona. This was attributed to the lack of hands-on experience among some Family Support Specialists. Comments that indicate this theme include:

> "*I feel as if they were reading on the Internet or had a child development class but that is not the same thing as hands on experience. The program needs more people who have experience with children for modeling*."

"My relationship was different from my sister's. My family worker was younger, had a different experience level. She didn't do some of the same activities my sister told me about. I didn't feel like I was getting what I wanted from the program."

A few participants talked about some practices of their home visitor that created problems for them. For instance:

"*There is not enough staff. And when one of my workers didn't call or show up when it was planned, that is really stressful for a family*."

"*…They need to be on time. There has been three times when she never calls when she can't show up for an appointment. Sometimes, I also experience attitude from them. She also needs to get back to me more promptly."*

It is also important to participants to have home visitors that can speak their language. In some places there is a shortage of bilingual staff as illustrated in this comment:

"*I think there's like two here (*referring to bilingual Spanish-speaking Family Support Specialists*). We need more. I talk and can listen better in Spanish; it's hard*."

Program participants and Healthy Families Arizona staff align closely with the objectives outlined by Healthy Families Arizona program. These objectives include such child and parent outcomes as appropriate developmental expectations, identification of developmental delays and early intervention, a better sense of support and access to community services, positive parent-child interaction, fewer incidents of child abuse and neglect, healthier children and parents, enhanced parental self-esteem and competence, improved family stability, and economic self-sufficiency. The comments were also suggestive of additional outcomes including: enhanced cognitive skills and the social and emotional development of children, both related to school readiness; improved relationships with significant others including spouses and partners; and reduced involvement with the justice system. Overall, the 16 mothers felt extremely benefited by Healthy Families Arizona in ways that closely support the intended outcomes. Program staff and Healthy Families Arizona participants view the program as generally effective in meeting the many outcomes mentioned, with a few exceptions noted by program staff in the areas of father involvement and nonviolent

discipline that can be impeded by extended family. Resources were also considered lacking in the areas of health care and stress management.

The 16 participants interviewed had a strong commitment to Healthy Families Arizona. The participants initially grew interested in Healthy Families Arizona as a result of the informational services and support the program provided, but they expressed continued participation in the program largely as a result of their relationships with their Family Support Specialists. These relationships are perceived as helpful and significant in achieving successful program effects. Overall, both current and former participants of the program reported that they were very satisfied with their experience in Healthy Families Arizona.

Retrospective Study of the Factors Related to Child Abuse and Neglect in Healthy Families Arizona

This section utilizes eight years of retrospective data (1997 through 2004) collected on Healthy Families Arizona program participants to identify the risk factors most strongly associated with child abuse and neglect. This study is limited by two factors. One, the study is restricted to those variables for which data are available in the database. Second, this study relies upon a definition of child abuse and neglect that is equivalent to a substantiated report as determined by Child Protective Services (CPS). Reliance on official CPS reports is limited since CPS substantiated cases are low occurring events, and many incidents of child abuse and neglect go unreported.

Selected Risk Factors for Child Abuse and Neglect

Families that enroll in Healthy Families Arizona often have many stresses in their lives. Stress is associated with an increased risk for child abuse. Table 1 highlights selected risk factors for two groups – Healthy Families Arizona program families (N = 4,432) and a group of families eligible for the program but who dropped out before completing at least four home visits (N = 1,755). The results are based on Healthy Families Arizona data from 1997 to 2004. What the information in Table 2 shows is that the typical Healthy Families Arizona participant, regardless of whether or not they engage in the program after four home visits, is likely not to have had prenatal care, is likely to be a single parent but not likely to be living alone with their child; about 30% are teenagers and the majority are not employed, and many are not high school graduates at the time of enrollment. The majority of participants, around 60%, reported severe childhood histories of abuse and neglect.

Table 2. Selected Risk Factors for Healthy Families Arizona Participants and Those Who Dropped Out Prior to 4 Home Visits

Selected risk factors at the time of program enrollment	Healthy Families Arizona Participants *N* = 4,432	Families Who Dropped Out Prior to 4 Home Visits *N* = 1,755
Late or no prenatal care, or poor compliance	37.9%	40.3%
Baby born with birth defects	1.0%	0.4%
Baby born <37 weeks gestation	13.1%	13.4%
Low birth weight (88 ounces or less)	12.5%	12.7%
Mother was single, separated, or divorced	78.7%	86.4%
Maternal age (18 or younger)	30.3%	32.8%
Unstable housing	17.5%	16.7%
Living alone with baby	10.4%	10.7%
Median household income	$9,300	$8,400
Marital or family problems	28.0%	27.0%
Mother unemployed	81.8%	78.3%
Mother less than 12 years of education	56.5%	57.3%
Mother has history of substance abuse	18.5%	19.0%
Mother has a history of psychiatric care	11.6%	9.5%
History of or current depression	29.0%	23.6%
Mother reported severe childhood history of abuse	59.8%	59.7%
Family Stress Checklist> 40 (considered high-risk for child abuse)	29.6%	27.1%

Incidence of Child Abuse and Neglect

Table 3 presents data regarding substantiated and unsubstantiated child abuse and neglect reports. The results are based on CPS data reported on Healthy Families Arizona families from 1997 through 2004. Table 3 shows similar percentages of CPS reports, substantiated or not, for families that engage and those who do not.

Table 3. Percent of CPS Reports for Healthy Families Arizona Participants

Group	No CPS Report	Substantiated CPS Report	CPS Report – Not Substantiated
Healthy Families Arizona Participants *N* = 4,432	83.1%	4.8%	12.2%
Those Who Dropped Out Prior to 4 Home Visits *N* = 1,755	82.1%	5.4%	12.5%

Note. Thirty-six Healthy Families Arizona participants have CPS reports with status unknown. As a result, these 36 participants are excluded from this table.

Individual Risk Factors for Child Abuse and Neglect

Table 4 provides demographic risk factor data for the Healthy Families Arizona population, both those who stayed in the program for four or more home visits and those who had fewer than four visits, among those with substantiated child abuse and neglect reports (*N* = 305) as compared to those with unsubstantiated reports (*N* = 754) and those with no CPS reports (*N* = 5,092) [2]. These factors include young maternal age, race/ethnicity, poor education, and unemployment.

These data illustrate notable risk factors for child abuse and neglect. As illustrated, mothers with substantiated and unsubstantiated CPS reports (versus no CPS report) are more likely to report they are Caucasian. Additionally, participants with substantiated reports of child abuse and neglect are more likely to have lower educational attainment (i.e., less than 12 years of education). Most notable is the difference in the employment status of the father among

[2] Thirty-six respondents have CPS reports but the status of the report is unknown and therefore excluded from data analysis.

participants with substantiated CPS reports, unsubstantiated reports, and no reports. Families experiencing CPS involvement are more likely to have a father who is not employed.

Table 4. Parent Characteristics by CPS report

Characteristics	No CPS Report *N* = 5,092	Substantiated CPS Report *N* = 305	Unsubstantiated CPS Report *N* = 754
Young maternal age (18 or younger)	31.3%	30.3%	29.5%
Average age of mother	22.18 years	21.75 years	22.16 years
Mother's race/ethnicity			
Caucasian	26.5%	42.1%	46.7%
Hispanic	54.8%	34.5%	34.6%
African American	5.2%	8.9%	8.3%
Asian American	0.4%	1.3%	0.1%
Native American	10.1%	6.9%	4.8%
Other	3.0%	6.3%	5.5%
Less than 12 years of education	55.8%	61.6%	59.4%
Average grade completed	10.56	10.29	10.36
Mother unemployed at time of program enrollment	80.3%	80.7%	84.2%
Father unemployed at time of program enrollment	28.9% (*N* = 4,224)	40.2% (*N* = 239)	32.7% (*N* = 594)

Table 5 presents mental health-related risk factor data linked to child abuse and neglect. These factors include depression, self-esteem problems, life stressors, potential for violence, attitude towards discipline, and past histories of pregnancy and abortion. As indicated, mothers with substantiated CPS reports reported higher rates of depression, histories of psychiatric care, more severe self-esteem problems, and greater stressors than those without child abuse reports and substantiated incidents. These findings are consistent with other research on child maltreatment that suggests that parents with self-esteem problems, including depression, place their children at an increased risk for child abuse and neglect. Maternal depression and psychiatric problems often lead to compromised parenting as depressed, withdrawn mothers may offer their babies poor stimulation and may have trouble

connecting with their babies emotionally (Kaplan, 1999). Furthermore, mothers who scored high on the *Family Stress Checklist* for their potential for violence and for their discipline attitudes have a greater likelihood of CPS involvement.

Interestingly, the average number of pregnancies was higher among participants with substantiated and unsubstantiated child maltreatment reports than participants without CPS reports. A participant's history of abortion was also higher among those with any CPS involvement, including those with unsubstantiated CPS reports.

Table 5. Percentage with mental health risk factors by CPS report

Personality Risk Factors at Time of Program Enrollment	No CPS Report *N* = 5,092	Substantiated CPS Report *N* = 305	Unsubstantiated CPS Report *N* = 754
History of psychiatric care	9.6%	16.7%	18.0%
History of or current depression	25.8%	36.7%	33.2%
Mother's self-esteem, available life-lines (noted as severe problems by *Family Stress Checklist*)	45.6%	60.3%	54.0%
Mother's stressors (noted as severe by *Family Stress Checklist*)	55.0%	67.9%	64.5%
Mother's potential for violence (severe risk)	12.6%	27.2%	22.1%
Mother's discipline attitude	3.8%	7.9%	4.8%
Average number of pregnancies	2.03	2.60	2.57
History of abortions	6.9%	7.9%	11.4%

Table 6 shows the percentage of mothers with a history of substance abuse. As indicated, mothers with substantiated or unsubstantiated reports of child abuse and neglect are more likely to report a history of substance abuse, a finding consistent with research on child maltreatment.

Table 6. Percentage of participants with substance abuse histories

History of Substance Abuse	No CPS Report *N* = 5,092	Substantiated CPS Report *N* = 305	Unsubstantiated CPS Report *N* = 754
History of substance abuse	16.8%	32.1%	24.8%

A history of maltreatment in one's own childhood is another risk factor that has been identified in association with abusive and neglectful parenting behavior (Belsky, 1993). Table 7 illustrates significantly higher rates of childhood abuse and neglect among individuals with substantiated and unsubstantiated CPS reports than individuals with no CPS involvement. This relationship holds for both mothers and fathers.

Table 7. History of severe childhood maltreatment

History of Childhood Abuse and Neglect	No CPS Report *N* = 5,092	Substantiated CPS Report *N* = 305	Unsubstantiated CPS Report *N* = 754
Childhood Abuse – Mother	56.7%	75.1%	73.2%
Childhood Abuse – Father	36.7%	41.9%	42.1%

Common child risk factors for maltreatment often include factors related to perinatal effects (i.e., premature birth, low birth weight), child disability, and child demographics (Belsky, 1993). Child risk factors are presented below in Table 8.

As illustrated, gestational age, low birth weight, positive drug screens, and intermediate intensive nursery care are more common among participants with CPS reports of child abuse and neglect and substantiated incidents than participants without CPS involvement. This is consistent with the child maltreatment literature. In contrast with some findings in the literature on child maltreatment (e.g., Jones & McCurdy, 1992; Margolin, 1990), there was

little difference between having a CPS report and having no involvement with CPS and the child's gender. Interestingly, participants with unsubstantiated CPS reports were more likely to have babies who were born early, and with lower birth rates than both participants with no CPS reports and those with substantiated reports of child abuse and neglect.

Table 8. Risk Characteristics for Infants

Risk Factors for infants at time of program enrollment	No CPS Report *N* = 5,092	Substantiated CPS Report *N* = 305	Unsubstantiated CPS Report *N* = 754
Born <37 weeks gestation	12.4%	14.5%	17.3%
Low birth weight (88 ounces or less)	11.9%	13.1%	17.1%
Positive alcohol screen	0.2%	0.3%	0.0%
Positive drug screen	0.4%	3.0%	0.7%
Birth defects	0.7%	1.0%	1.1%
Intermediate or intensive nursery care	11.2%	15.8%	15.8%
Mother had late or no prenatal care, or poor compliance	38.1%	43.3%	37.9%
Attachment issues as reported by mother	11.6%	23.0%	14.7%
Male child	50.2%	51.5%	51.9%

Family-level Risk Factors

Research demonstrates that family dynamics and parental involvement are related to a child's potential for maltreatment. Characteristics of abusive families often include single parenting, low family income (i.e., less than $15,000 per year), large family size (i.e., more than four children), and family conflict. Table 9 highlights the risk factor data at the family level.

As illustrated with the data, maltreating participants (those with substantiated CPS reports) report slightly more children on average, are more likely to live below $15,000 per year, live alone, have unstable housing, report marital or family problems and are more likely to be

single parents. This is consistent with literature on child maltreatment which often reports differences between abusing and non-abusing families in terms of low income, large number of children or large household size, living alone, single parenthood, and conflict among family members.

Table 9. Familial risk factors

Familial risk factors at time of program enrollment	No CPS Report *N* = 5,092	Substantiated CPS Report *N* = 305	Unsubstantiated CPS Report *N* = 754
Single, divorced, or separated	80.1%	84.3%	83.8%
Living alone	9.3%	16.4%	14.9%
Unstable housing	16.6%	22.3%	19.9%
Median yearly income	$9,600	$7,200	$7,200
Income <$15,000	76.6%	87.8%	81.8%
Average household size	4.79	4.48	4.73
Four or more living children	8.8%	14.8%	13.8%
Average number of living children	1.75	2.19	2.09
Marital or family problems	25.2%	41.6%	37.8%

Societal and Environmental Factors

Societal factors play an important role in creating conditions that can contribute to childhood abuse and neglect. Such factors often identified in the literature on child maltreatment include neighborhood poverty and reduced social connectedness (Gillham et al., 1998). Table 10 shows differences among those with CPS reports and those with unsubstantiated and substantiated reports.

The support families receive outside of the home can be an important factor in the potential for child abuse and neglect. As illustrated by the data, participants with unsubstantiated and substantiated CPS reports were more likely to feel alone and without friends or adequate emergency contacts than those without CPS involvement.

Table 10. Societal Factors

Societal risk factors at time of program enrollment	No CPS Report *N* = 5,092	Substantiated CPS Report *N* = 305	Unsubstantiated CPS Report *N* = 754
Inadequate emergency contacts	11.6%	17.4%	15.3%
Societal risk factors at time of program enrollment	No CPS Report *N* = 2,494	Substantiated CPS Report *N* = 124	Unsubstantiated CPS Report *N* = 378
Feel alone and without friends	23.2%	35.5%	27.7%

Note. There is a significantly reduced number of participants for "feel alone and without friends" due to the number of participants who completed the *Parenting Stress Index*, upon which this measure was taken.

Predictors of Child Abuse and Neglect

In order to investigate which risk factors were significantly associated with official reports of child abuse and neglect while controlling for other factors, logistic regression analyses were conducted. Logistic regression is used to predict a discrete outcome (e.g., substantiated child abuse and neglect versus no substantiated report of neglect or abuse) from a set of predictor variables (Menard, 2001).

After running each variable independently, final models were run on the dependent variables in which all variables were entered simultaneously. Only those variables found to be statistically significant predictors of group membership in the bivariate logistic regression analyses, and only those variables that were consistently reported (i.e., had no more than 15% of missing data)[3], were included in the final models.

Table 11 summarizes the results of the logistic regression equations containing the significant variables predicting the odds of CPS status for two separate models. The first model uses *any* CPS involvement as compared to those without CPS involvement; the second model predicts child maltreatment using *substantiated* CPS reports as compared to those without CPS

[3] The following variables were excluded in logistic regression analyses due to the extent of missing data: history of psychiatric care, marital/family conflict, history of depression, household income, and household size.

reports. The table presents only the direction and statistical significance of the relationships. The statistical information including coefficients (b), standard errors (se) and odds ratios (Exp(b)) for these models can be found in Appendix B (Tables B3 & B4).

Table 11 indicates six factors that significantly predict the likelihood of any CPS involvement. Nine factors increase one's odds for *substantiated* CPS reports. The variables that were significant for both models include mother's age, mother lives alone, mother's race/ethnicity, mother has a history of childhood abuse, and mother has a strong potential for violence. The age of the mother significantly predicts the likelihood of CPS involvement as the odds of child maltreatment decreases as mother's age increases. The likelihood of CPS involvement increases among mothers living alone, mothers identifying as Caucasian, those with a history of childhood abuse and neglect, and mothers with a strong potential for violence as measured by the Parent Survey (Family Stress Checklist).

Table 11. Logistic Regression Predicting the Probability of Child Abuse and Neglect

Variable	Probability of Any CPS Involvement (Model 1)	Probability of a Substantiated CPS Report (Model 2)
Mother single, separated, divorced	↑ Increases with single mother*	Not significant
Mother's age	↓ Decreases as mother's age increases***	↓ Decreases as mother's age increases***
History of substance abuse	Not significant	↑ Increases with mother's history of substance abuse
Number of living children	Not significant	↑ Increases as number of living children increases**
Mother lives alone	↑ Increases with mother living alone*	↑ Increases with mother living alone*
Mother's race/ethnicity	↑ Increases with white mother***	↑ Increases with white mother***
Childhood history of abuse and neglect	↑ Increases with history of abuse*	↑ Increases with history of abuse*
Violence potential	↑ Increases as potential increases***	↑ Increases as potential increases***
Discipline attitudes	Not significant	↑ Increases with more severe attitudes*
Attachment	Not significant	↑ Increases with lower attachment levels*

Note. ***p<.001, **p<.01, *p<.05. n.s. = not significant. *Any* CPS involvement (Model 1: *N* = 3,110); *Substantiated* CPS report (Model 2: *N* = 3,147).

Variables that were significant for one model but not the other include single parenting for those with *any* CPS involvement; among those with *substantiated* CPS reports, a history of substance abuse, the number of living children, a mother's attitude towards discipline, and difficulty attaching to one's child were significant factors. As such, in Model 1, the likelihood of CPS involvement increases among mothers who are single than among those who are not when holding all other variables constant. When predicting a substantiated CPS report, there is an increase in the odds of abuse and neglect among mothers with a history of substance abuse, families with large numbers of living children, mothers who rate severe

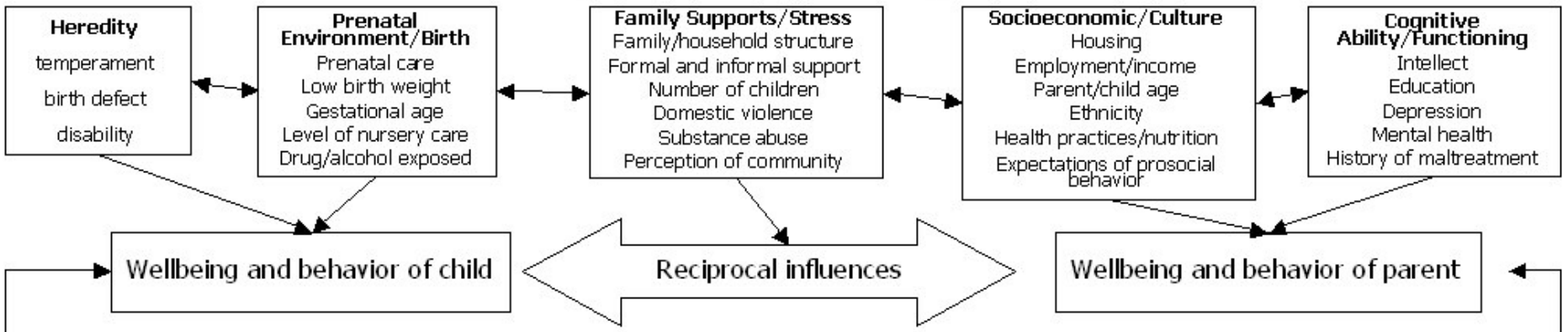
their attitude towards discipline, and mothers who report difficulty attaching with their children.

The second model predicting *substantiated* CPS reports yields a significantly better fit to the data. The second model classified 94.9% of cases correctly while the first model correctly predicted 83.4% of the cases. Furthermore, the goodness of fit test is used to choose the model that does the best job of prediction with the fewest predictors and is larger in the second model (3072.63) than the first model (3005.38). Looking at the model chi-square, we can conclude that the variables, when taken together, differentiate the two categories of the dependent variable (e.g., those with *any* CPS involvement versus those without involvement, and those with *substantiated* CPS reports versus those without any CPS involvement) (model 1: $x^2 = 277.69$, $df = 24$, $p < .001$) (model 2: $x^2 = 139.44$, $df = 19$, $p < .001$).

Model of Change

Figure 3 presents the model of hypothesized relationships for the longitudinal evaluation. It is based on the review of the literature, the exploratory study, and the retrospective study findings. The model can be described as an ecological transactional model. It is ecological in the sense that it includes three levels: the micro (individual), mezzo (family) and macro (community), and suggests that no single risk factor places or protects any child from risk of poor outcomes, but rather it is the interaction of factors that is important. The model is transactional in the sense that these factors are believed to mutually influence and determine the amount of risk that an individual faces (Belsky, 1993). Sameroff and Chandler (1975) offered a transactional model of child development, suggesting that biological risk factors and environmental stresses are involved in a synergistic process that shape outcomes. This model guides the measurement, hypotheses, and analyses for the longitudinal evaluation.

Model of Change in Healthy Families Arizona



Mechanisms for Change

- Increase in parental monitoring
- Prevention of negative behavior
- Increased knowledge of child development
- Developmentally appropriate expectations
- Encourage exploration vs. control
- Belief in noncorporal discipline/limit setting
- Greater empathy for child
- Careful selection of alternative caretakers
- Stimulating environment (toys, verbalization, reading)
- Safer home
- Access to preventive medical care
- Greater responsivity to child
- Improved parenting skills
- Goal setting (futuristic orientation)
- Increased problem solving skills
- Reduced stress
- More positive social support network
- Preschool/early intervention services
- Budgeting
- Coping skills

Sample Activities	**Program Implementation**
•Screen domestic violence, substance abuse, depression, mental health	enrollment
•Facilitate community referrals and advocate	intensity
•Teach stress reduction techniques	Caseload
•Provide emotional support	Supervision
•Teach problem solving	Training
•Address budgeting and finances	Community resources
•Encourage father involvement	Collaboration
•Discuss family planning, nutrition and home safety	FSS characteristics
•Teach bonding and stimulation activities	Relationship with FSS
•Model and promote insight into parent/child interaction	Satisfaction with HFAz
•Reinforce positive parent/child interaction	Community risk factors
•Teach parent to read child's cues	Program components
•Provide information on developmental norms	Retention
•Complete regular developmental assessments	
•Encourage routine medical care and immunization	

Outcomes

- Maltreatment (positive discipline techniques; CPS substantiated child abuse & neglect; hospitalizations, mortality
- Family wellness (immunizations and well-child checkups; continuous health insurance coverage; consistent medical home; preventive dental care; better outcomes in subsequent births: gestational age, birth weight, intensive care, delayed birth)
- Child development (fewer developmental delays; fewer behavior problems in the clinical range; school readiness: language & emotional development
- Parent/child relationship (positive perception of the child; stronger attachment; parental competence, role acceptance; less time in substitute care)
- Family functioning (community resource utilization; domestic violence and child exposure to domestic violence; substance abuse; mental health; depression; parental coping skills; education; housing employment; income; transportation; involvement with the justice system; social isolation).

Evaluation of the Program Logic Model

The Healthy Families Arizona program logic model lists 10 outcome objectives. A substudy was conducted to evaluate how the objectives are currently measured, with the philosophy that when an outcome is measured, it attracts focus and is more likely to be attained. Each objective is presented below with an assessment of how it is currently measured, or not measured, in the Healthy Families Arizona program. As noted from the list below, a number of the program objectives rely on measurement using the Healthy Families Parenting Inventory (HFPI). This newly developed instrument designed by LeCroy & Milligan Associates, Inc. is for use in the Healthy Families Arizona program. The Healthy Families Arizona longitudinal evaluation will not use the HFPI as a measure because it is so new and the validation study is currently in progress.

Based on the findings from the retrospective study of Healthy Families Arizona participants from 1997 to 2004, it would appear that the greatest gaps in measurement are in the areas of reconciliation of childhood history of abuse, violence potential, attitudes towards discipline, and attachment difficulties. Ongoing assessment of these difficulties is essential to providing support and assessing change in these areas.

	Measured	Not Measured
Increase the support network	• HFPI (social support subscale) • Family and Social Support services referred and received (FSS-23) • Community Service	living situation, i.e., lives alone with child
Improve mental health	• HFPI (depression, personal care subscales) • Counseling and supportive services referred and received – FSS-23; referral for domestic violence, substance abuse, and mental health	

	Measured	Not Measured
Increase health behaviors	• Alcohol screen (CRAFFT) • Subsequent birth FSS20 • Parents health provider • Parents health insurance	No tracking of tobacco use, and the information gained from the CRAFFT is minimal on alcohol and tobacco. Ongoing assessment of these factors is required
Increase problem solving skills	• HFPI (problem solving and mobilizing resources subscales)	
Improve family stability	• Public assistance referral (FSS-23) • Employment, training and education referral (FSS-23) • Income • Education • Employment	There is no tracking of housing, budgeting, family planning and length of interval to subsequent pregnancy, or the receipt of TANF,WIC, other benefits (cash or in-kind), child support, or literacy resources.
Increase parental competence	• HFPI-accepting the parent role, parent competence, parenting efficacy subscales	
Increase positive parent-child interaction	• HFPI -parent child behavior subscale	There is no recording of discipline strategies, father involvement, child's contact and relationship with father, child support, living with or married to father of baby.

	Measured	Not Measured
Improve child health	• Immunization • Medical home • Health insurance • ER visits for routine matters • Home safety checklist • Health care referral (FSS-23) • Well-child checkups	There is no tracking of nutrition, dental health, injuries and ingestions, days hospitalized, or ER use.
Optimize child development	• ASQ – screen for developmental delays • HFPI-home environment subscale • Referral for developmental delay (FSS-20)	There is no school readiness measure.
Prevent child abuse and neglect	• CPS Substantiated reports for target child and all dependent children in the home.	Physical discipline strategies

Blueprint for the Healthy Families Arizona Longitudinal Evaluation

The Healthy Families Arizona longitudinal evaluation was designed to deal with the criticisms of previous longitudinal and experimental evaluations, as well as evaluations of home visiting programs in general. As such it:

1. uses random assignment to treatment and control groups to look at the program as the cause for any observed changes between the two groups;
2. tests a series of hypothesis and calculates significant effect sizes, i.e., the difference needed in order to claim success;
3. is designed to provide adequate statistical power, i.e., the sample size is large enough to have confidence that if the null hypothesis is rejected the alternative hypothesis is likely true given the likelihood of moderate effect sizes;
4. examines established and stable Healthy Families Arizona sites that provide adequate variation across the program in participants, communities, and Healthy Families Arizona administration; 6 metro sites and 1 semi-rural tribal site leading to diversity in geographic area and population served.
5. specifies the program theory in advance; the longitudinal evaluation is guided by a theory of change based on a review of theoretical and empirical literature on child maltreatment and home visitation
6. measures fidelity to the program model (e.g., intensity of the home visits, content of the home visits and supervisory sessions);
7. measures the services received by the control group; hence it recognizes that this group are non-participants who may receive services through other means, thus the Healthy Families Arizona program is being compared to available community services without the benefit of home visitation;
8. uses measures with good validity and reliability, and where possible measures that go beyond self-report; in addition to substantiated child abuse and neglect the evaluation examines method of discipline, exposure to domestic violence, and childhood injuries

9. employs evaluation across sites to determine if treatment effects can be replicated. Replication of treatment effects is one standard for judging the validity of the causal claim that the program is responsible for the outcome. The importance of replication is based on the notion that no single realization will ever be sufficient for understanding a phenomenon with validity;
10. to the extent possible, employs blind data collection.
11. follows a true experimental design with intent to treat, meaning that families are tracked even after leaving the program

Participating Healthy Families Arizona Sites

The evaluation team established a set of criteria to target site selection. The Healthy Families Arizona quality assurance (QA team) provided information on the 23 established Healthy Families Arizona sites and it was decided that the best choice for sites in a metro area would be Tucson, based on stability of staff and number of participant openings. Tucson has six established sites in the metro area. A seventh site in the rural Tucson area was selected to increase diversity among the sites studied. The selected sites are well-established sites with minimum staff turnover and demonstrated success in engaging and retaining participating families. The seven Healthy Families Arizona sites included in the longitudinal evaluation are presented in Table 12.

Table 12. Participating Healthy Families Arizona Sites

1. Blake
2. Casa De Los Niños
3. CODAC
4. La Frontera (1)
5. La Frontera (2)
6. Parent Connection
7. Pascua Yaqui Health Department

Target Participants

The participants in the longitudinal evaluation include the mothers of target children. The age of the participants will include anyone able to bear children. Based on data from previous years, approximately 20 to 30% of participants are expected to be teenagers. Based on demographic data from the sites selected for the longitudinal evaluation, participation should include a significant number of ethnic minority women, especially Hispanic, African American, and Native American women. Inclusion criteria include becoming a new parent, and scoring above a standardized threshold on two assessment instruments as well as consenting to participate in the program.

There are also four exclusion criteria. The longitudinal evaluation will exclude from recruitment:

- Families referred to Healthy Families Arizona by CPS
- Families who self-refer
- Families for which the hospital social worker makes a referral to Healthy Families Arizona
- Families that are particularly crisis ridden as determined by the FAW staff in consultation with their supervisor.

Recruitment

A total sample size of 190 participants is needed for the longitudinal evaluation, allowing for a 20% attrition rate over the life of the evaluation. Split evenly between the two groups, the desired size of the experimental and control groups is approximately 95 families each.

Recruitment for the longitudinal evaluation will follow the standard Healthy Families Arizona recruitment process that currently exists at the sites. Following the birth of a child at one of the referral hospitals, the Healthy Families Arizona 15-item screen will be conducted. Families who screen positive will be asked if a Family Assessment Worker (FAW) from Healthy Families Arizona can contact them. If the family consents to contact, the parent(s) will be asked if they are interested in participating in a randomized study referred to as the Arizona Child Development Project. If the family is not interested they will be provided

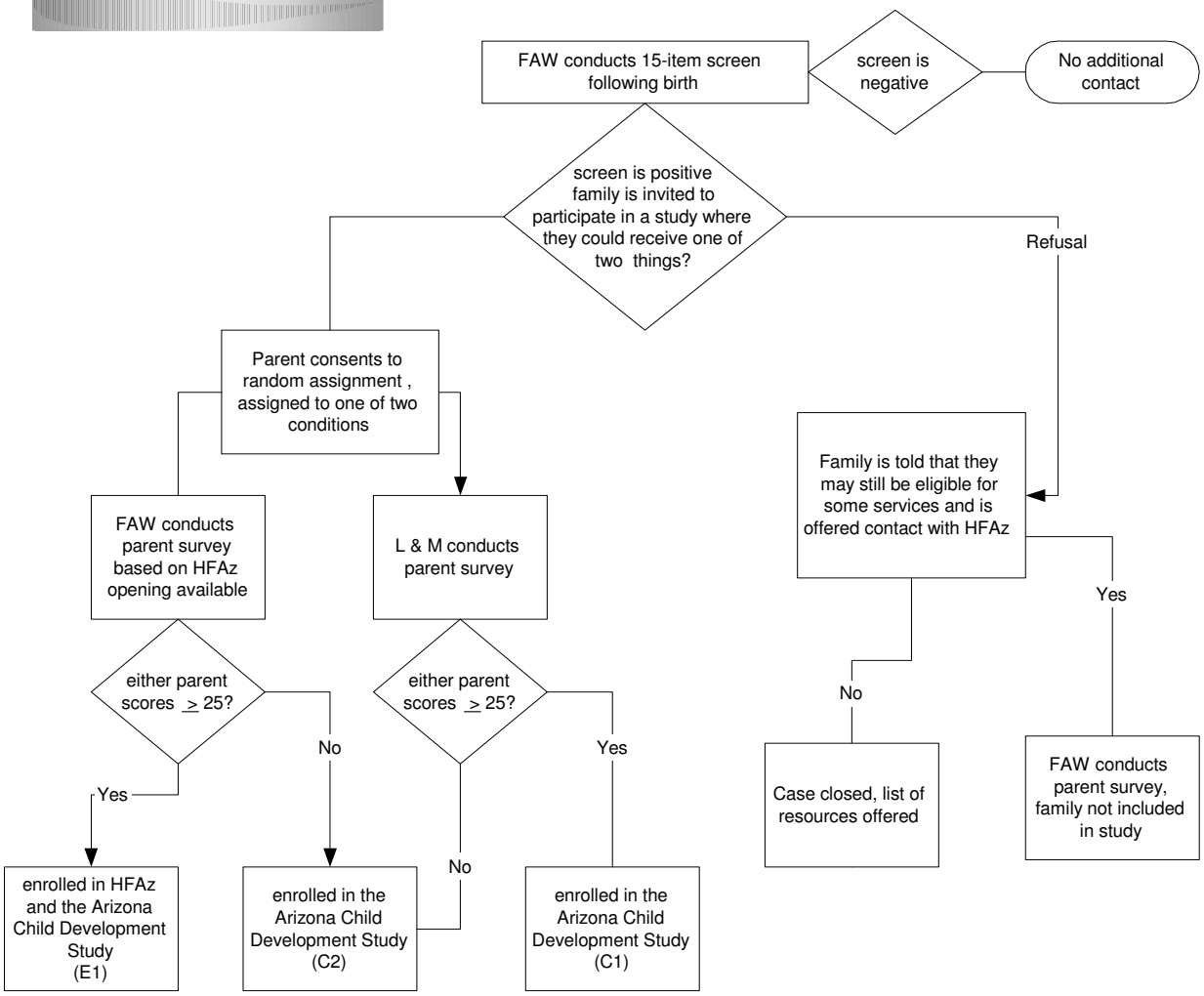
with information on Healthy Families Arizona without the longitudinal evaluation and an outline of services in their community. If the family is interested in participating they will be randomly assigned to one of two groups.

Families will be informed that participation in the study on child development includes free developmental assessments of their children at regularly spaced intervals, referral to community resources, and monetary incentives that increase in value on an annual basis. They will also be advised of the time commitment of the study - a maximum commitment of 90 minutes per in-home visit. Families will also be informed that if they move or decide not to continue with Healthy Families Arizona they can still participate in the study on child development and receive monetary incentives as promised. In some instances, if the family moves out of state, participation would be by telephone.

Those participants who agree to participate in the Arizona Child Development Project will be asked to sign an informed consent form outlining a description of the Healthy Families Arizona longitudinal evaluation and any potential benefits and risks. The consent will also outline the incentives for participation and the responsibility of the participant and researcher. One copy of the signed consent will be left with the participant and a second copy will be kept on file at LeCroy & Milligan Associates, Inc.

Recruitment for the longitudinal evaluation began November 1, 2005. Recruitment was delayed from the target of summer 2005 due to the number of openings in the participating Healthy Families Arizona sites, which discouraged directing potential participants toward the control group for financial reasons. Recruitment for the evaluation will end when the desired number of families has been enrolled. Based on current enrollment, this is likely to be approximately a six-month period.

Procedure for Random Assignment



E1 = experimental group (HFAz)
C1 = equivalent control group not receiving HFAz services
C2 = nonequivalent control group, not eligible, and not receiving HFAz

Data Collection

The outcome portion of the longitudinal evaluation will collect two sets of data independent of the ongoing Healthy Families Arizona program operations. Maternal demographic data and risk factor data will be collected on a questionnaire that includes items that are subject to change such as education and health insurance. Outcome data will be collected on the effects of the home visitation services.

Data collection will occur in the home and each visit will average 90 minutes. In the first year there are three data collection visits. Data collection visits will be annual in years two through five (for a total of seven visits over a period of five years). Data collectors masked with respect to the participants' treatment assignment will gather the data. That is, the data collectors will not be aware of whether or not the family is enrolled in Healthy Families Arizona and will not ask any questions about participation in Healthy Families Arizona. All questionnaires will be read to participants to ensure that they properly understand all items. Charts that depict the response categories for questions with ordinal level responses will be used as visual aids.

Data Collection Staff

A trained data collection team unaware of the specific hypotheses and uninvolved in Healthy Families Arizona program implementation will collect all data. Three individuals employed by LeCroy and Milligan Associates, Inc. will collect the data for the Healthy Families Arizona Longitudinal evaluation. The data collectors will carry the title of Research Assistant. The data collectors will be female because the majority of Healthy Families Arizona participants are women and data collection requires that participants respond to sensitive questions on mental health, depression and domestic violence.

Qualities of the data collectors include a bachelor or associate degree in a related field (social work, psychology, nursing, etc.), the ability to speak Spanish, good communication and interviewing skills, and a reliable means of transportation. Data collection staff will have to submit to a criminal record check and must have proof of a valid driver's license with current insurance and registration. Data collectors will not for any reason transport participants.

Commitment to the five-year longitudinal evaluation is a plus, although that cannot be guaranteed or expected.

Schedule of Standardized Measures

The following table presents a list of standardized measures that will be implemented at different observation points in the longitudinal evaluation. The standardized measures are integrated into the overall questionnaires that have been developed for each data collection point.

Table 13. Schedule of Standardized Measures

Measure	Baseline	6 mo.	12 mo.	24 mo.	36 mo.	48 mo.	60 mo.
Mental Health Inventory	x	x	x	x			
CES-D (Depression Index)	x				x		
Parent Survey	Control only						
Being a Parent	x	x	x		x		x
Adult-Adolescent Parenting Inventory 2	x	x	x		x		
Eyberg (behavior)					x	x	x
Bracken (school readiness)							x
Goals Scale	x	x	x	x			
Social Support (ESLI)	x	x		x			
Mobilizing Resources	x	x				x	
Safety checklist		x	x		x	x	x
HOME		x		x			
ASQ (developmental delay)		x	x	x	x	x	x

Data Analysis

Differences in those who agree to participate and those who do not will be analyzed in terms of demographics and scores on the *Family Stress Checklist*. Between group differences will be analyzed at baseline. Multivariate analysis will follow the model of change and the particular method of statistical analysis will depend on the scale of measurement on the particular outcome variable examined. For instance, factors accounting for the difference in outcomes that are categorical such as child abuse and neglect or no CPS involvement will be analyzed using logistic regression. Effect sizes will be calculated on significant differences and highlighted if meaningful ($d > .33$).

Study Retention Efforts

The success of any longitudinal study is reliant upon participant recruitment and retention. Losing participants from a project can have detrimental effects to the success of studies that extend over long periods of time. Studies with high drop out rates can yield biased findings and lack integrity and validity. Maintaining participation over the life of a study is essential to informing valid conclusions about the impact of program services. The goal of the Healthy Families Arizona longitudinal evaluation is to lose no more than 20% of participating families to attrition. To reach this goal, LeCroy & Milligan Associates, Inc. will implement a comprehensive retention and incentive strategy. As part of our retention efforts, this project will utilize the following procedures:

- A history of repeated contacts with families that are positive in nature. Research Assistants will emphasize and respect families' rights to privacy and confidentiality, assume a nonjudgmental approach, be flexible and punctual, and establish good rapport by contacting participants by mail at least once during each quarter (e.g., personalized reminder letters, birthday cards). Research Assistants will also encourage participants to contact them through the project's 1-800 number[4] when they have questions, know about changes in their location, or need service referrals.

[4] A 1-800 number for participants to call the program at no cost or hassle that is involved in placing a collect call will be maintained throughout the life of the project.

- LeCroy & Milligan Associates, Inc. will retain project personnel to the extent possible so that the same Research Assistant acts as the primary and continuing contact for their assigned families over the life of the project.
- At each interview, the Research Assistants will stress the importance of the evaluation and the benefits of continued participation (i.e., developmental information, referral to resources, and participant incentives).
- Participant burden in the project will be minimized (e.g., interview length will not exceed 90 minutes and only 7 interviews are required over five years). Furthermore, families' scheduling needs will be accommodated through convenient appointment times and locations.
- A project identity (the Arizona Child Development Project) will be created and promoted through the use of a project logo that can reduce concerns about the credibility of the project and help facilitate recognition of correspondence related to the project.

- Project staff will establish associations with Healthy Families Arizona program staff as well as community agencies that may have contact with participants (e.g., educational institutions, treatment programs). These associations are for the purpose of tracking participants and efforts will begin early in the evaluation to establish these relationships by advertising the evaluation.
- Detailed participant contact information will be collected and updated at every interview or as soon as participant location changes are made.
- Confirmation letters will be mailed once interviews are scheduled (approximately one to two months before the next interview period).
- Project staff will make reminder phone calls two days before an interview and a personalized letter will be sent two weeks prior.

- Participants will be asked to inform project staff of changes in contact information and will be provided with change of address cards, business cards, and a refrigerator magnet that display project phone numbers and timelines for follow-up assessments. The project's 1-800 number will also be on all project materials and correspondence.
- Project staff will send birthday cards to immediate family members.
- Contact information of participant's relatives, friends, neighbors, or coworkers who are likely to know the family's whereabouts will be secured at each interview. If relatives and friends are contacted regarding participant's whereabouts, staff will ask to send them a business and change of address card to give to the participant if they see them.
- A wide variety of tracking sources (e.g., family and friends, Internet locator sites, directory assistance, phone books, license providers) will be tapped to locate missing participants.
- All contact information, including the nature and results of attempted and successful contacts will be maintained in the Healthy Families Arizona longitudinal evaluation-tracking database. This database will include ongoing, comprehensive notes documenting any and all family contacts and contact attempts.

Incentives

Cash incentives for participation will be discussed with participants at each interview. Participants will receive $60 for Year 1 ($20 for each data collection period including initial, six and 12 months), $30 for Year 2 (24 months), $40 for Year 3 (36 months), $50 for Year 4 (48 months), and $60 for Year 5 (60 months). Incentives ($10 cashier's check) will also be provided to families who inform project staff of changes in contact information (i.e., relocation or change in telephone number). Families participating in the longitudinal evaluation will be eligible for four $125 drawings – two midway and two at the end of the five-years.

Informed Consent

Healthy Families Arizona Family Assessment Workers will explain the longitudinal evaluation to participants. The Research Assistants will administer the informed consents. The Informed Consent will be read to participants and their questions will be answered. Upon consenting to participate in the longitudinal evaluation, participants will be asked to sign the informed consent form. A copy of the consent form will be provided to participants. Participants may refuse to participate or withdraw from the longitudinal evaluation at any time without consequence and may refuse to answer any questions they do not want to answer. There will be no impact on the services participants can use or will be offered by the state or other service providers among participants who change their mind about participating or answering any specific question(s). Participants may also stop using or refuse services from Healthy Families Arizona and still participate in the Healthy Families Arizona longitudinal evaluation.

Protection – Data Security, Storage, and Confidentiality

A separate database from the ongoing Healthy Families Arizona evaluation will be developed for the longitudinal evaluation. The data entry staff at LeCroy and Milligan Associates, Inc. will enter the data and file the hard copy records. In order to preserve the confidentiality of all subjects the following procedures will be followed:

- Each family will be assigned a unique identification number.
- Each assessment rating form will be coded with the ID number rather than a name to protect confidentiality.
- Names or other identifying information will not be noted in reports to the Arizona Department of Economic Security, published papers, or within other written reports.
- The data will be stored in file folders in the LeCroy and Milligan office in one lockable cabinet. The file cabinet will be for the exclusive use of the Healthy Families Arizona longitudinal evaluation.
- Only the principal investigator, co-principal investigators, data collection and data entry staff will have access to the data and the list of names associated with the unique identifiers.

- Data collectors will not store data in their cars or brief cases.
- The hard copy data will be destroyed one-year following completion of the Healthy Families Arizona longitudinal evaluation.

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Appendix A: Summary of the Literature Related to the Theory of Change

Child Development

A great deal of evidence now points to the early years in a child's life as the most important in terms of human growth and development. If a child's development does not proceed normally, or if it is not nurtured along a positive path, it may be near impossible to reverse the negative impact. The early years also present greater risk for child abuse and neglect, including death. Children age three years and younger are the most frequent victims of child fatalities (National Clearinghouse on Child Abuse and Neglect Information, 2004). In 2002, infants accounted for 41% of child fatalities resulting from abuse and neglect, while children under age four accounted for 76%. The following review looks at critical periods of children's growth and development, and the risk and protective factors associated with resilience and risk at various stages of development from conception until five years of age.

***Prenatal to Birth*.** Prenatal development is divided into three trimesters. During the first two months the developing human is called an embryo. The embryo has three layers from which all body organs develop. During the second trimester the developing human is called a fetus. During the third trimester the individual is a baby that if born prematurely is likely to survive with extra support.

The prenatal environment and the child's genetic endowment are associated with risk for child abuse and neglect, developmental delay, behavior problems, and the need for special education in kindergarten. Two recent studies show the impact of low birth weight, perinatal conditions, and sociodemographic factors on educational outcome in kindergarten (Resnick et al., 1999; Avchen et al., 2001). Research indicates that mothers who are highly stressed during pregnancy or exposed to violence tend to have active fetuses and irritable babies. Exposure to prenatal stress and other risk factors can alter or slow a baby's brain development and have long-lasting implications for later development (Better Brains for Babies, 2002). The most common prenatal risks in addition to stress are infectious diseases, neurotoxins, nutrient deficiencies, and premature birth.

Many infectious diseases, such as rubella can cause severe malformations in the developing fetus. Sexually transmitted diseases can also harm the fetal environment and some like HIV can be passed from the mother to the baby during birth. If the mother ingests any toxic substances such as drugs, alcohol, or tobacco, the babies receive these as well. Fetal Alcohol Syndrome (FAS) and Fetal Alcohol Effects (FAE) produce many of the same problems and are irreversible causing physical and mental damage. Symptoms of FAS include facial deformities. Other symptoms of FAS and FAE are similar and include impaired behavioral and cognitive functioning. FAS is the leading cause of mental retardation; at least 5,000 babies in the U.S. are born each year with FAS. Many children labeled as learning disordered are suspected to be FAE. The lack of specific nutrients at certain times in prenatal development can also place the unborn child at risk. Folic acid, for example, plays an important role in the development of the neural tube early in the pregnancy. Other nutrient deficiencies including iron and zinc can place the developing brain at risk. Premature birth interrupts the final stages of prenatal brain development as well as vital organ functioning such as the lungs.

The impact of the Healthy Families Arizona program in the prenatal environment is not a factor in the longitudinal evaluation because all of the participants are enrolled postnatally. The program must, however, be prepared to deal with whatever challenges the prenatal environment delivers. The program will endeavor to influence the prenatal environment for subsequent pregnancies of the enrolled mothers and this will be addressed in the longitudinal evaluation.

Infancy[5] Not many years ago, scientists thought that by the time a baby was born, the structure of the brain was already determined. In contrast, we now know that the brain is the least developed organ at birth, and how it develops depends on the care and experiences a child receives. The earliest years are the most important in wiring the brain correctly. At birth, the brain has about 100 billion nerve cells called neurons, most of them unconnected.

[5] The following information on development through age five is from the Tribune in Education. (2004). Ready to Learn.

The connections or synapses are formed by the child's experiences. Touching, talking to, and playing with a baby help create healthy synapses. As the infant hears, sees, smells, and feels, the neurons form trillions of connections, forming an intricate network of neural pathways. The patterns in which these connections are formed helps lay the groundwork for future learning and self-regulation. Literacy starts at birth and grows over many years. As parents talk and sing to their babies, their babies are developing listening skills. There are important windows of opportunity for synapses to develop. For instance, if a baby were kept in a completely dark room for the first three months of his or her life, and was then moved into the light, he or she would be irreversibly blind. The window of opportunity for visual development would be gone. There are many things parents can do to promote optimum infant brain development during infancy including establishing routines for basic care, providing good nutrition, adequate and regular sleep, health care, a sense of security, and stimulation and play.

Age One to Three Years. The limbic system of the brain develops between ages one and three years. This system is responsible for emotional development. A child who is touched frequently with loving warmth and whose needs are met on a consistent basis develops healthy emotional responses. A child who experiences neglect, abuse or severe stress will not develop normally. Negative experiences can result in social withdrawal, explosive or inappropriate emotions, or the inability to form normal emotional relationships. Children who are not encouraged to play, or who are rarely given attention will develop brains that are 20% to 30% smaller than normal.

Age Three to Five Years. The final portion of the brain to be formed is called the neocortex, which is greatly affected between the ages of three and 10. The neocortex is the largest part of the brain and provides intellect, creative thinking and computing. If developed properly, it also provides empathy, compassion, and love. Age five is a critical time in a child's life as they prepare to enter kindergarten. There is a wide difference in the development of children entering kindergarten. There are, however, some guidelines on readiness for kindergarten. Children are usually ready for kindergarten if they can leave their parents without too much

difficulty, go to the bathroom alone, play well with and respect other children, follow simple directions and rules, resolve some conflicts with other classmates without needing the teacher, work independently for at least five minutes, sit and listen to a story for 10 minutes, and talk in complete sentences.

Risk and Protective Factors for Child Maltreatment

The causes of child abuse and neglect are many and often linked in ways that are extraordinarily complex. Most theories of child maltreatment recognize that the root causes can be organized into a framework of four principal systems: (1) the individual parent and child, (2) the family, (3) the community, and (4) the larger societal macrosystem. Within each of these systems, numerous factors have been found to increase a child's risk for maltreatment and poor developmental outcomes, while other factors have been found to protect children from the effects of risk factors and against maltreatment and poor developmental outcomes. Researchers studying the etiology and effects of child maltreatment have argued for a simultaneous study of multiple individual, family and community risk and protective factors, suggesting that it is more than just one factor that makes certain segments of the population more likely to report child abuse histories or experiences (Belsky, 1993; Brown et al., 1998; Cicchetti & Lynch, 1993). Studies noting the resilience of some children who come into contact with multiple risk factors have increasingly focused on the multitude of protective factors that can reduce risks, build family capacity, and foster resilience. The following factors have been identified as important in the risk and protection of child abuse and neglect and enhancing positive child development.

Individual Factors

The majority of research related to risk and protective factors for child maltreatment have tended to focus on individual-level characteristics, particularly the parent, and primarily the mother. Parental risk factors have included such variables as maladaptive personality traits, substance abuse, parental demographics (e.g., race/ethnicity, age, education, and employment), and a history of maltreatment in one's own childhood (Chan, 1994; Wu et al., 2004; Zuravin, 1991).

One risk factor commonly cited in the literature on child maltreatment is the mental health status of a parent, including low self-esteem, depression, social isolation, and loneliness. The physical and social isolation that often follows birth, combined with hormonal changes during pregnancy and after birth, place mothers at an increased risk of mood disorders such as depression, anxiety, and parental stress. Approximately 13 percent of women experience postpartum depression, with higher rates among women of low socioeconomic status and younger age (O'Hara & Swain, 1996). Maternal depression makes infants vulnerable to early developmental deficits because of compromised parenting. Kaplan (1999) suggests that depressed mothers may offer their infants relatively poor stimulation, which often leads to delays in acquiring language and other cognitive milestones. Furthermore, when depressed mothers talk to their babies, their speech lacks the pitch changes and other elements of baby-talk that serve to increase the infant's state of arousal, the state in which infants process information more efficiently or completely. Maternal depression can also have small but significant long-term effects on the child's emotional development (Beck, 1998). Other psychological characteristics, such as impulsivity, anger, poor psychological or emotional adjustment, a propensity towards interpersonal conflict, and poor impulse control have also been empirically linked to parental risk of child maltreatment (Belsky, 1993; Chaffin, Kelleher & Hollenberg, 1996; Cicchetti, 2004; Dubowitz & Black, 2002; Erickson & Egeland, 2002).

Research suggests that parents who abuse drugs or alcohol are also more likely to abuse their children (National Clearinghouse on Child Abuse and Neglect, 2004; Windham et al., 2004). There are many ways in which parental substance abuse may impact the safety and health of children (Chaffin, Kelleher, & Hollenberg, 1996; Dubowitz & Black, 2002; Tanner & Turney, 2003). According to Donohue (2004), mothers who abuse substances "spend less time with their children, are inconsistent with discipline, are more likely to be socially isolated, and fail to supervise their children." Substance abusing parents may be emotionally or physically unavailable to their children, increasing the risk for accidental injuries and abuse by others (Wallace, 1996). Heavy drug use can interfere with the parent's ability to provide consistent nurturing care giving and limit setting that promotes children's development and protects against behavior problems. Substance-abusing parents may also

divert money for basic needs such as housing, food, and utilities away from the family to support their habit (Munkel, 1996). Parental substance abuse may also interfere with the ability to maintain employment and may increase the parent's involvement with the criminal justice system, further limiting their ability to provide support for the family (Magura & Laudet, 1996). Furthermore, parents using drugs or alcohol may expose children to criminal behavior, weapons, environmental hazards, and the abusive actions of other children and adults (Munkel, 1996). Finally, children living with substance abusing parents are more likely to become intoxicated or ingest harmful chemicals either deliberately or by passive inhalation or accidental ingestion.

Parent ethnicity has emerged as an independent predictor of discipline practices in multivariate regression. Black parents have been found to be twice as likely to report frequent spanking, and Spanish speaking Hispanic parents while less likely to use aversive discipline are also less likely than White, non-Hispanic parents to use positive discipline strategies including taking away a toy, the use of time out or explanation (Regalado et al., 2004). Chaffin, Kelleher and Hollenberg (1996) similarly found that non-white parents are more at risk for abusive and neglectful behavior than white parents. Despite these findings, some studies suggest an inconclusive relationship between abuse and ethnicity. For instance, some studies show African Americans and Hispanics are more at risk for maltreatment (Wang & Daro, 1998), while other studies fail to show differences by race (Sedlak & Broadhurst, 1996).

Some studies suggest that it is not ethnicity that influences the likelihood of abuse and neglect but rather that child maltreatment appears to be a problem of economics and teen child bearing, both of which minorities are more likely to experience. Young maternal age has also been a consistent predictor for risk of child maltreatment, where adolescent parents are twice as likely as older parents to report the use of spanking and are at greater risk for neglecting their children (Baumrind, 1994; Chaffin, Kelleher, & Hollenberg, 1996; Jones & McCurdy, 1992). Lee and Goerge (1999) found that by the age of five, children born to mothers seventeen or younger were approximately 4.1 times more likely to become victims of neglect than children born to mothers 22 years or older, even without the effect of other

factors, i.e., poverty. Furthermore, Brown et al (1998) suggested that maternal youth was associated with an increased risk for all forms of maltreatment, not just neglect.

Parents with low intellect and low education have also been found to pose a greater risk for maltreatment than parents with higher educational levels (Dubowitz & Black, 2002). Interestingly, maternal employment is associated with less parental frustration suggesting that it may provide respite from the demands of child rearing.
A history of maltreatment in one's own childhood is another risk factor for resorting to abusive and neglectful behaviors (Belsky, 1993; Renner & Slack-Shook, 2004). Murphy, Orkow and Nicola (1985) found that the most common factor present in mothers who abuse or neglect their children was that they themselves were beaten or deprived as children. Parents who had insecure attachment with their own parents have also been found to be at a higher risk for abusing or neglecting their children.

Common child risk factors for maltreatment include premature birth and low birth weight (Belsky, 1993; Dubowitz & Black, 2002; Erickson & Egeland, 2002). Windham et al (2004), for instance, found that mothers of infants who were small for their gestational age were nearly six times more likely to report severe physical abuse compared to mothers of normal weight infants. Studies have also emphasized the impact perinatal problems, difficult temperament or behaviors, child age and gender, and disability have on a child's risk for maltreatment. Parents who engage in abusive and neglectful behaviors tend to view their children as temperamentally difficult (Belsky & Vondra, 1989). For example, Brayden (1992) found that mothers who neglected their children regarded their child as more temperamentally difficult (e.g., frequent temper tantrums and irritable) than those mothers who did not neglect their children. While finding no association between child maltreatment and frequent temper tantrums, Sidebotham et al (2003) found higher rates of child maltreatment among mothers who reported fewer positive attributes in their children as compared to mothers who reported higher levels of positive attributes.

Child age has been a commonly reported risk factor for child maltreatment. A 10-year retrospective study of medical records of children submitted to the National Pediatric Trauma Registry compared 1,997 children injured by child abuse with 16,831 children injured unintentionally. The study reported that children who were injured by abuse were younger, sustained more injuries, and had more functional restrictions than children who were injured unintentionally (DiScala et al., 2000). Jones and McCurdy (1992) found that younger children (i.e., those under five) had a greater potential for experiencing sexual abuse and neglect while older children were more likely to experience emotional abuse. The authors suggest that children under the age of three suffer neglect more than any other age group, and the risk for neglect decreases as the age of the child increases. Conversely, yelling and spanking as a means of parental discipline has also been found to increase with the age of the child (Regalado et al., 2004).

Child gender is another characteristic that has been found to be associated with child maltreatment. However, the exact relationship between gender and maltreatment is uncertain when considering physical abuse and neglect. Jones and McCurdy (1992), for instance, found that being female correlated with an increased risk of neglect, while Margolin (1990) found that boys are at a greater risk of neglect. However, the inconclusive nature of the relationship may be the result of reporting bias within the child welfare system rather than a lack of wavering findings. One form of abuse where gender is a significant predictor is sexual abuse. Jones and McCurdy (1992) found that females accounted for 84% of sexual abuse victims while Finkelhor (1984) reported that approximately 71% of victims of sexual abuse are female. One of the most disconcerting findings of the relationship between gender and maltreatment, specifically neglect, was identified by Margolin (1990) who found that boys were at an increased risk of death than girls.

A growing amount of research has focused on the impact a physical, cognitive or emotional disability has on a child's risk for abuse and neglect (National Clearinghouse on Child Abuse and Neglect Information, 2004; Sullivan & Knutson, 2000). Available research has found that children with disabilities and developmental difficulties are more vulnerable to maltreatment than children without disabilities or developmental delays. One national study

(Crosse, Kaye & Ratnofsky, 1994), found that children with disabilities were 1.7 times more likely to be maltreated than children without disabilities. Sullivan and Knutson (2000) found that disabled children were 3.4 times more likely to be the victim of some type of maltreatment than their nondisabled peers. Children with disabilities also tend to be maltreated at younger ages than nondisabled children (i.e., preschool age versus elementary years). Since it is estimated that between 9 and 15 percent of all children in the U.S. have a disability of some kind (National Incidence Study of Child Maltreatment, 1996), the incidence of child abuse and neglect can be severely impacted by parental response to their child's disability(ies). Caring for a child with a disability can amplify stress for families as there may be increased financial burdens, extra demands for physical and emotional care, inadequate outside support, and delayed child development, which may result in a disappointment over the child's lack of progress over time (Martinson, 1990). These stressors may lead to an even greater potential for child abuse and neglect.

Individual Level Protective Factors. Research has attempted to identify factors that protect children from maltreatment and poor developmental outcomes. Some parent-level traits and characteristics that have been identified as protective factors include parental resilience, secure attachment with children, nurturing, instilling household rules and effective monitoring of their child, high parental education, knowledge of parenting and child development, good communication skills, healthy prenatal care, and parental reconciliation with their own childhood history of abuse (Department of Health and Human Services, 2002; National Clearinghouse on Child Abuse and Neglect, 2004). The parent's ability to be flexible and adaptable to changing life situations and circumstances and find ways to effectively reduce stress have also been found to be significant protective factors.

Child-level protective factors that have been examined mostly relate to age, i.e., older children are at a lower risk for child maltreatment. Other protective factors include a healthy lifestyle, above-average intelligence, good peer relations, an easy temperament and positive disposition, positive self-esteem, good social skills, an internal locus of control, controlled disabilities, attachment to a parental figure, and a healthy balance between seeking help and autonomy (National Clearinghouse on Child Abuse and Neglect Information, 2004).

Providing children and families with early intervention and special education services for disabilities can also play an important role in the prevention of child abuse and neglect.

Family Factors

Research demonstrates that family dynamics and parental involvement are significantly correlated with a child's potential for being abused or neglected. Family factors associated with an increased risk for child maltreatment include household size, marital factors (e.g., single parenting), family functioning (i.e., paternal involvement, disorganization, family conflict), and low income.

One commonly cited risk factor for child abuse and neglect is household size. Researchers have found that household size is positively associated with parents who become neglectful, and that risk for neglectful behavior increases as household size increases (Chaffin et al., 1996). In other words, as the number of people in a home increases, particularly when there are several children within the home, a child's risk for becoming a victim of abuse or neglect also increases (Chaffin, Kelleher, & Hollenberg, 1996; Jones & McCurdy, 1992; Polansky et al, 1985; Sun-Pyng, 2001). For instance, Sedlak and Broadhurst (1996) found that the number of persons in the home increased the rate of neglect by 2.25 times with four or more children in the home, and children with families with four or more children also experienced physical neglect at three times the rate of single-child families.

Another common variable found in the literature on child maltreatment is the impact being a single parent has on resorting to abuse or neglect (Chaffin et al, 1996; Ciccetti, 2004). Researchers suggest that maltreated children often reside in homes characterized by single parenting, oftentimes a single mother, where stress may overwhelm the parent. Windham et al (2004) found that mothers with no partners were nearly five times more likely to report child abuse and almost twice as likely to report emotional abuse compared to mothers in non-violent partner relationships. Some recent studies have found that families with two-married parents encounter more stable home environments, fewer years in poverty, and diminished material hardship (Lerman, 2002).

Other family variables examine the impact family functioning has on influencing the risk of child maltreatment (Baumrind, 1994; Erickson & Egeland, 2002; Tanner & Turney, 2003). Neglecting families have been characterized as more chaotic, less well organized, and less expressive of positive affect than non-neglectful families (Gaudin et al., 1996). Furthermore, neglectful families demonstrate less negotiation skills and readiness to assume accountability for their feelings.

Research also identifies the impact parental absence, primarily the absence of a biological father, has on a child's risk for maltreatment (Dubowitz et al., 2001). Although many fathers want to be involved in their baby's care, some father's lack of experience and confidence about what to do can pose a significant risk for child abuse and neglect. One of the biggest challenges for fathers is managing the competing demands of home and work. Many fathers lack workplaces that are family friendly and supportive to the needs of working parents. The challenges of father involvement are further increased when the parents are not living together. Research by Mazza (2002) with urban African-American adolescent first-time fathers has shown that helping fathers with their basic needs in addition to parenting classes is more effective than parenting classes alone in terms of gains in employment, vocational planning, feeling positive about their current relationship with their children, using birth control, and being able to plan for the future.

Conflict between parents is also associated with risk for child maltreatment (Brown et al., 1998). Over the past few decades there has been a growing awareness of the co-occurrence of domestic violence and child maltreatment (Appel & Holden, 1998). Research suggests that between 30 to 60 percent of families where either domestic violence or child maltreatment is identified, it is likely that both forms of abuse exist (Appel & Holden, 1998). In a national survey of over 6,000 American families, 50 percent of men who frequently assaulted their wives also abused their children (Edelson, 1995). An estimated 3.3 to 10 million children a year are at risk for witnessing or being exposed to domestic violence, which can produce a range of emotional, psychological, and behavioral problems, not to mention the risk of direct harm (Carlson, 2000). A review of CPS cases in two States identified domestic violence in

approximately 41 to 43 percent of cases resulting in the critical injury or death of a child (Spears, 2000).

Poverty. Data from official reports and surveys have identified low socioeconomic status as a major contributing factor of maltreatment, particularly neglect (Baumrind, 1994; Black, 2000; Brown et al., 1998; Chaffin et al, 1996; Cicchetti, 2004; Dubowitz & Black, 2002; Erickson & Egeland, 2002; Garbarino & Collins, 1999; Garbarino & Kostelny, 1992; Gaudin, 1999; Korbin et al, 1998; Sedlak & Broadhurst, 1996). Low socioeconomic status includes a wide range of factors associated with poverty, including unemployment, limited education, social isolation, large number of children, and childbirth to unmarried adolescents (Crittenden, 1999, 48). It is important to note, however, that maltreatment also occurs in affluent families and that only some families living in poverty neglect and abuse their children. Nevertheless, a wealth of research has found that poverty is a strong predictor of substantiated maltreatment and thus the socioeconomic status of families cannot be overlooked. Drake and Pandey (1996), for instance, found that higher poverty levels are associated with higher incidence of substantiated cases of neglect as compared to low poverty areas. Furthermore, Regalado et al (2004) found that low-income parents tended to endorse harsher discipline, held stronger beliefs about the value of spanking, and experienced higher levels of stress. Higher levels of stress were also associated with more negative perceptions of the child and more intense cognitive emotional processes, suggesting that socioeconomic differences in discipline are due to differences in parenting beliefs and more intense cognitive emotional processes that are linked to higher levels of stress. The influence of poverty as a risk factor of child maltreatment is further enhanced when combined with young maternal age. Drake and Pandey (1996) discovered that children born to mothers living in high poverty areas who were seventeen or younger were 17 times more likely to have a substantiated case of neglect than children born to mothers living in low poverty areas who were 22 years or older.

Poverty may also impact a family's ability to receive consistent and preventive medical care. Only 75 percent of all children in Arizona have all the baby shots they need by age two. Information from *The Arizona Partnership for Immunization* (TAPI) reports that parents

often do not realize their children are not current on their immunization schedule. Giving baby shots according to the recommended schedule helps to protect babies for a lifetime. Child immunizations protect against 12 serious childhood diseases: measles, mumps, Rubella (German Measles), Diphtheria, Tetanus, Pertussis (Whopping Cough), Polio, Haemophilus influenzae type b, Pneumococcus, Hepatitis A, Hepatitis B, and Varicella (Chicken Pox) (www.cdc.gov.nip). Regular medical visits are not only important to preventing major childhood diseases, but problems like ear infections and hearing and vision problems can create irreversible effects if not treated early. Furthermore, unhealthy children have a greater risk for maltreatment as their temperament is often affected by how well they feel. A sick infant may be more likely to cry, creating a situation whereby a parent resorts to abusive behavior to try and quiet the child.

Family Level Protective Factors. The research on family level factors consistently indicates that poverty, number of children in the home, single parenthood, and conflict among family members are correlates of child maltreatment. Maltreating parents, particularly mothers, are more likely to have more children, live in poverty, and are more likely to be single parents with several children in the home. Consequently, the presence of a supportive family environment including those with a two-parent household, extended family support, stable and healthy relationships between and among family members, financial support and economic opportunities, and family expectations of pro-social behavior are identified as protective factors against child maltreatment and have been linked to significant reductions in child maltreatment and improved developmental milestones for children.

Community and Environmental Factors

Community and environmental factors play an important role in creating conditions that can contribute to childhood abuse and neglect. The literature on child maltreatment suggests that environmental stressors including neighborhood poverty and reduced social support affect families through the effects they have on the social environment within which families live (Gillham et al., 1998).

Neighborhood Poverty. Drake and Pandey (1996) found that concentrated neighborhood poverty, often coupled with unemployment and limited economic opportunity, is a risk factor for children and that it is associated with all types of child maltreatment. This research suggests that poverty creates excessive stress on families that develops a climate conducive for abuse and neglect. Furthermore, impoverished families often become involved with social service agencies for financial support and, therefore, are at a greater risk to be reported to child welfare authorities if abuse or neglect is suspected. Interestingly, Korbin et al (1998) found that impoverishment and child care burden have less of an impact on child maltreatment rates in predominantly African-American than in predominantly European American neighborhoods. Rather, the perceived quality and social connectedness found in neighborhoods (e.g., how similar or dissimilar the social fabric of the community is) plays a more important role in whether or not its families maltreat their children.

Social Support and Isolation. Social isolation of parents and families has been conceptually and empirically examined in the literature on child maltreatment (Belsky, 1993). The support families receive outside of the home can be equally important as the support received within it. Mothers who neglect their children often report smaller social networks (Gaudin et al., 1994) and receive less social and emotional support from their social networks (Brayden et al., 1992). Polansky et al (1985) found that neglectful mothers were more likely to be lonely, saw their neighborhoods as less friendly and helpful, and had fewer people to turn to for emotional support than similarly situated mothers who did not neglect their children. Likewise, Bishop and Leadbeater (1999) found that abusive mothers reported fewer friends in their social support networks, less contact with friends, and lower ratings of quality support received from friends. Paris and Dubus (2005) reported that mothers of newborns in many western cultures report feeling isolated from other adults. They found that most mothers are generally unprepared for the intense feelings of loneliness in the postpartum period. Social isolation is more prevalent in today's society as large numbers of women are living far away from close family, and often go through the parenting experience alone.

Community Level Protective Factors. The environmental level factors that increase a child's risk of maltreatment also create risk for poor developmental outcomes. Many maltreated children live in poverty and in environments where their family is socially isolated from others. The neighborhoods these children often live in are disorganized, sometimes violent, and oftentimes lack social and economic opportunities including lack of access to medical care and child care (National Clearinghouse on Child Abuse and Neglect, 2004). As a result, children living in poverty have greater vulnerability to conditions associated with disability including low birth weight and chronic illness. These conditions, as previously discussed, can increase family stress, thus increasing a child's risk for maltreatment. Accordingly, social and environmental factors that may help protect children from maltreatment and developmental delays include middle to high socioeconomic status, access to adequate health care and social services, adequate housing, family participation in a religious faith, good schools in "healthy" communities, and supportive adults outside of the family who serve as good role models or mentors for the family (National Clearinghouse on Child Abuse and Neglect Information, 2004).

The Consequences of Child Maltreatment

Maltreatment can affect children in numerous ways. These effects are often physical, psychological, intellectual, behavioral, interpersonal, and self-perceptual. Among the physical health consequences are shaken baby syndrome (SBS), which can lead to blindness, mental retardation, paralysis, or even death (Conway, 1998). Furthermore, an estimated thirty percent of maltreated children suffer chronic health problems (Hammerle, 1992). Aside from the physical injuries associated with abuse and neglect, maltreated children often experience neurological damage, have high levels of stress, and, overall, poor health (Gaudin, 1999). Psychological consequences of abuse and neglect often result in increased anxiety levels among maltreated children, high levels of anger and aggression, feelings of guilt and shame, depression, and social isolation (Donohue, 2004; Erickson & Egeland, 2002; Gaudin, 1999; Lynch & Cicchetti, 1998; Tanner & Turney, 2003).

Another consequence of maltreatment is its impact on children's academic performance. Child abuse and neglect has been shown to have an adverse influence on academic performance. Sullivan and Knutson (2000) found that maltreated disabled and nondisabled children received significantly lower scores in reading and mathematics than nonmaltreated peers. A study of 840 children from kindergarten through twelfth grade found that maltreated children performed significantly below their nonmaltreated peers on standardized tests, repeated more grades, and had more disciplinary referrals and suspensions (Eckenrode et al., 1993). Comparing 400 adults who had been maltreated when they were 11 or younger with a control group of adults who had not been maltreated, Perez and Windom (1994) found that those adults who had been maltreated had a lower rate of high school completion and higher levels of grade retention, suspension, and expulsion than those who had not been maltreated. Maltreated children often evidence more difficulties with behavioral problems including delays in achieving developmental milestones, poor impulse control, shyness, social withdrawal, trouble socializing with peers, disruptive behavior, delinquency, and inappropriate behaviors associated with substance abuse (Donohue, 2004; Erickson & Egeland, 2002; Gaudin, 1999; Lynch & Cicchetti, 1998; Tanner & Turney, 2003). Maltreated children are also likely to suffer interpersonal problems including insecure attachments with others, particularly poor victim/perpetrator attachment (Donohue, 2004; Erickson & Egeland, 2002; Tanner & Turney, 2003). Children who have been maltreated also suffer perception problems resulting in low self-esteem among victims and learned helplessness (Erickson & Egeland, 2002; Lynch & Cicchetti, 1998).

The intergenerational transmission of violence is another concern of maltreatment where victims may "model" the inappropriate behaviors on their own children (e.g., abuse and neglect) and in their own relationships (e.g., domestic violence) (Gaudin, 1999). It is estimated that approximately one-third of the victims of child abuse will perpetuate the cycle of violence by abusing their own children (Prevent Child Abuse New York, 2001). Research studies have found the presence of three categories of childhood problems associated with exposure to domestic violence: behavioral, social and emotional problems; cognitive and attitudinal problems; and long-term problems such as adult depression and trauma symptoms and increased tolerance for and use of violence in adult relationships (Ganley & Schechter,

1996). The consequences of witnessing family violence vary according to the child's unique stage of development. For instance, infants exposed to violence may have difficulty forming attachments with their caretakers, preschool children may regress developmentally or suffer from eating and sleep disturbances, and school age children may struggle with peer relationships, academic performance, and emotional stability. Children who witness domestic violence and are physically abused demonstrate increased levels of emotional and psychological maladjustment than children who only witness violence and are not abused (Carlson, 2000; Edelson, 1999).

Appendix B: Definition and Codes for Variables

Variable	Coding	Definition
Dependent variable for report Model 1	1=CPS involved 0=No involvement	Substantiated or unsubstantiated CPS report No CPS report
Dependent variable for Model 2	1=Substantiated 0=No CPS report	CPS report
Mother single, separated, divorced	1=yes, 0=no	Mother is single, separated, or divorced at time of program entrance.
Mother's age	Year	Mother's age at time of baby's birth
Unstable housing	1=yes, 0=no	No home, uncertain of having home, questionable address, such as homeless shelter.
<12 years of education	1=yes, 0=no	Mother has less than 12 years educ. at time of program entrance.
Inadequate emergency contacts	1=yes, 0=no	No immediate family (parents, sibs. partner/spouse) listed for emergency contact or no phone given for emergency contact.
History of substance abuse	1=yes, 0=no	Mother has history of substance abuse
History of abortions	1=yes, 0=no	Mother has history of abortions
History of psychiatric care	1=yes, 0=no	Mother has had history of psychiatric or active psychiatric care.
Marital/family problems	1=yes, 0=no	Indication of discord among the family.
History of depression	1=yes, 0=no	Mother has history of depression, self or staff reported.
Received late or no prenatal care, or poor compliance	1=yes, 0=no	Prenatal care after the 12th week of pregnancy, poor compliance (missed appointments or not following medical advice), or no prenatal care.
Gestational age	In weeks	
Birth weight	In ounces	
Child gender (male)	1=male, 0=female	
Income	In dollars	at time of program enrollment

Household size		Number of people living in house at program enrollment
Number of living children		Number of living children at time of birth
Number of pregnancies		Number of total pregnancies
Birth health: Positive screen	1=yes, 0=no	positive alcohol screen at birth alcohol
Birth health: Positive drug screen	1=yes, 0=no	positive drug screen at birth
Birth health: Birth defects	1=yes, 0=no	Baby was born with birth defects
Intensive or intermediate nursery care	1=yes, 0=no	Baby received intensive/intermediate nursery care.
Mother lives alone	1=yes, 0=no	Mother lives alone at time of enrollment
Mother's race/ethnicity	1=white, 0=nonwhite	
Mother unemployed	1=yes, 0=no	Mother was unemployed at time of enrollment
Childhood history of abuse	1=10, 0=0 or 5	
Self-esteem, available life-lines, severe	1=10, 0=0 or 5	
Current life stresses/concerns	1=10, 0=0 or 5	
Violence potential, severe	1=10, 0=0 or 5	
Discipline attitudes, severe	1=10, 0=0 or 5	
Difficult child	1=10, 0=0 or 5	
Expectations for infant	1=10, 0=0 or 5	
Attachment	1=10, 0=0 or 5	
Competence parent's	Score on PSI subscale[6]	*Parenting Stress Index,* assesses sense of competence in relation to role as parent.

These items are obtained from the *Family Stress Checklist,* as rated severe for mother. A score of 0 represents normal, 5 represents a mild degree of the problem, and a 10 represents severe.

[6] The PSI scales were excluded from the final full logistic regression models due to the extent of missing data (upwards of 66% of missing data). When included in the full model, the only variable that was found to be significant ($p<.05$) was distractibility in the second model (the model predicting child abuse/neglect by comparing substantiated CPS reports with those participants with no CPS reports (N=1,379). None of the PSI scales were significant in the first model.

Parental Attachment	Score on PSI subscale	assesses the parent has in the role of parenting.
Restrictive Role	Score on PSI subscale	assesses negative impact losses, and sense of resentment in loss of important life roles.
Depression	Score on PSI subscale	assesses extent to which parent's emotional availability to child is impaired.
Isolation	Score on PSI subscale	examines parent's social isolation and availability of social support.
Distractibility	Score on PSI subscale	assesses degree to which child displays behaviors associated with ADD/ADHD and other behaviors that might drain parent's energy.
Mood	Score on PSI subscale	assesses child characteristics related to excessive crying, withdrawal, and depression.

Logistic Regression Analyses

In logistic regression, coefficients (b) tell the change in the log odds of being in the category of interest on the dependent variable (e.g., the change in the log odds of child maltreatment), associated with a one-unit change in the independent variable, controlling for all other independent variables in the model (Menard, 2001). If the coefficient of a predictor variable is positive, then the probability of the outcome increases as the numerical value of the variable increases, with all other variables being held constant. Conversely, if the sign of the coefficient is negative, then the probability of the outcome decreases as the numerical value of the variable increases, with all other variables being held constant. The Exp(B) represents the relative change in odds of child maltreatment (the odds ratio) associated with a unit change in the independent variable (Menard, 2001). Odds ratios close to 1.0 indicate that a unit change in the independent variable does not significantly affect the dependent variable. Logistic regression was conducted with each variable run independently on the dependent variables (see Appendix B for a list of all variables and their respective results (Tables B1 & B2). When examining the descriptive characteristics of participants with no CPS

involvement, those with substantiated CPS reports, and those with unsubstantiated CPS reports, there were numerous similarities between those with substantiated and unsubstantiated reports. Consequently, two dependent variables were included in the logistic regression analyses. The first dependent variable consisted of *any* CPS involvement (substantiated and unsubstantiated reports) versus no CPS involvement. The second dependent variable consisted of official reports of child maltreatment measured by *substantiated* CPS reports (unsubstantiated CPS reports were excluded) versus no CPS reports.

Table B1. Logistic Regression Results with One Independent Variable on Child Abuse & Neglect/CPS involvement (those with *any* CPS involvement versus those without CPS involvement).

Variables	b	s.e.	B	N
Mother single, separated, divorced**	.2475	.0908	1.2809	6135
Mother's age	-.0042	.0058	.9959	6098
Unstable housing**	.2712	.0853	1.3115	5925
Less than 12 years of education-mother*	.1738	.0699	1.1899	6008
Income	-3.8E-06	2.903E-06	1.0000	4534
Inadequate emergency contacts***	.3791	.0953	1.4610	5868
History of substance abuse-mother***	.6277	.0800	1.8733	5657
History of abortions***	.4424	.1151	1.5564	5865
History of psychiatric care***	.6917	.0950	1.9970	5204
Marital/family problems***	.6750	.0751	1.9639	5086
History of depression***	.4113	.0757	1.5088	5158
Gestational age, in weeks**	-.0391	.0123	.9617	5582
Baby's birth weight, in ounces***	-.0067	.0015	.9933	6113
Received late or no prenatal care	.0628	.0699	1.0648	5954
Birth health: Positive alcohol screen	-.6196	1.0527	.5381	6035
Birth health: Positive drug screen***	1.3324	.3580	3.7902	6035
Baby born with birth defects	.3371	.3441	1.4009	6035
Child gender (male)	.0588	.0676	1.0606	6141
Intensive or intermediate nursery care***	.3856	.0954	1.4704	6076
Household size	-.0321	.0202	.9684	5022
Number of living children***	.2229	.0252	1.2497	6138
Number of pregnancies***	.1830	.0189	1.2009	6132
Mother lives alone***	.5739	.1004	1.7751	4739
Mother's race/ethnicity (white)***	.9023	.0711	2.4654	5896
Mother unemployed***	.2464	.0974	1.2794	5967
Childhood history of abuse/neglect***	.7690	.0757	2.1575	6129
Self-esteem, available lifelines, severe***	.4172	.0682	1.5178	6130
Current life stresses/concerns, severe***	.4504	.0709	1.5690	6126
Violence potential, severe***	.7686	.0839	2.1567	6112
Discipline attitudes, severe**	.4050	.1517	1.4993	6011
Difficult child**	.6965	.2450	2.0067	6110
Expectations for infant*	.5895	.2948	1.8031	6101
Attachment***	.4592	.927	1.5829	6132
Competence**	.0214	.0077	1.0217	3005
Parental attachment*	.0306	.0129	1.0311	2980
Restrictive role***	.0337	.0094	1.0343	3002
Depression***	.0363	.0076	1.0370	2999
Isolation***	.0519	.0106	1.0533	3003
Distractibility	.0066	.0112	1.0066	2676
Mood*	.0308	.0154	1.0313	2679

***p<.001, **p<.01, *p<.05.

Table B2. Logistic Regression Results Running One Independent Variable on Child Abuse and Neglect (those with *substantiated* CPS reports to those without CPS reports).

Variables	b	s.e.	B	N
Mother single, separated, divorced	.2715	.1612	1.3119	5381
Mother's age	-.0132	.0104	.9869	5351
Unstable housing**	.3895	.1437	1.4763	5196
Less than 12 years of education-mother*	.2671	.1241	1.3062	5267
Income**	-2.5E-05	8.52E-06	1.0000	3967
Inadequate emergency contacts**	.4899	.1583	1.6321	5156
History of substance abuse-mother***	.8952	.1311	2.4478	4966
History of abortions	.1515	.2203	1.1636	5141
History of psychiatric care***	.5998	.1628	1.8217	4557
Marital/family problems***	.7753	.1285	2.1712	4457
History of depression***	.4618	.1279	1.5870	4529
Gestational age, in weeks	-.0183	.0221	.9819	4894
Baby's birth weight, in ounces**	-.0065	.0025	.9936	5364
Received late or no prenatal care	.2111	.1204	1.2351	5227
Birth health: Positive alcohol screen	.6209	1.0558	1.8606	5298
Birth health: Positive drug screen***	2.1504	.4127	8.5879	5298
Baby born with birth defects	.2800	.6027	1.3232	5298
Child gender (male)	.0480	.1180	1.0492	5387
Intensive or intermediate nursery care*	.3743	.1634	1.4540	5330
Household size*	-.0884	.0404	.9154	4422
Number of living children***	.2522	.0406	1.2869	5385
Number of pregnancies***	.1691	.0287	1.1843	5381
Mother lives alone***	.7335	.1677	2.0823	4137
Mother's race/ethnicity (white)***	.7727	.1233	2.1656	5188
Mother unemployed	.2032	.1711	1.2253	5230
Childhood history of abuse/neglect***	.8647	.1374	2.3743	5376
Self-esteem, available lifelines, severe***	.6152	.1213	1.8501	5379
Current life stresses/concerns, severe***	.5928	.1280	1.8091	5374
Violence potential, severe***	.9732	.1358	2.6463	5360
Discipline attitudes, severe***	.7669	.2251	2.1532	5268
Difficult child	.1641	.6001	1.1783	5359
Expectations for infant**	.6227	.2279	1.8639	5351
Attachment***	.8390	.1433	2.3140	5379
Competence	.0262	.0143	1.0266	2627
Parental attachment	.0415	.0237	1.0424	2608
Restrictive role***	.0660	.0175	1.0682	2624
Depression***	.0515	.0139	1.0529	2621
Isolation***	.0731	.0196	1.0758	2625
Distractibility	.0038	.0209	1.0038	2320
Mood	.0174	.0290	1.0175	2323

***p<.001, **p<.01, *p<.05.

Table B3. Logistic Regression Predicting the Probability of Child Abuse and Neglect, Model 1 comparing those with *any* CPS involvement (substantiated and unsubstantiated reports) (1) to those without CPS involvement (0).

Variables		b	s.e.	Exp(B)
Mother single, separated, divorced*		.3339	.1391	1.3964
Mother's age***		-.0684	.0131	.9339
Unstable housing		-.0114	.1334	.9887
Less than 12 years of education-mother		.0382	.1157	1.0389
Inadequate emergency contacts		.2351	.1603	1.2651
History of substance abuse-mother		.2069	.1240	1.2298
History of abortions		.1780	.1886	1.1948
Gestational age of baby, in weeks		.0069	.0273	1.0069
Baby's birth weight, in ounces		-.0054	.0030	.9947
Birth health: Positive drug screen		.3201	.7577	1.3773
Intermediate or intensive nursery care		.2331	.1714	1.2625
Number of living children		.2242	.1519	1.2513
Number of pregnancies		.0743	.0453	1.0771
Mother lives alone*		.2775	.1219	1.3198
Mother's race/ethnicity (white)***		.9448	.1133	2.5724
Mother unemployed		.2009	.1530	1.2225
Childhood history of abuse/neglect***		.3937	.1140	1.4825
Self-esteem, available lifelines, severe		.2063	.1064	1.2291
Current life stresses/concerns, severe		.1465	.1119	1.1577
Violence potential, severe***		.6344	.1273	1.8859
Expectations for infant		.3080	.2213	1.3608
Discipline attitudes, severe		.2654	.2172	1.3040
Difficult child (mother's perception)		-.0933	.4534	.9109
Attachment		-.0967	.1524	.9078
Constant*		-2.0699	.9709	
-2 Log Likelihood	2517.277			
Goodness of Fit	3005.379			
Model Chi-Square	277.691***			
Degrees of freedom	24			
Correctly Predicted	83.44%			

N=3110; ***p<.001, **p<.01, *p<.05.
Note: Dependent variable is official reports of child abuse and neglect, measured by *any* CPS involvement.

Table B4. Logistic Regression Predicting the Likelihood of Child Abuse and Neglect, Model 2 comparing those with *substantiated* CPS reports (1) to those without CPS reports (0).

Variables		**b**	**s.e.**	**Exp(B)**
Mother's age***		-.1004	.0229	.9044
Unstable housing		.2610	.2000	1.2982
Less than 12 years of education-mother		.1171	.1929	1.1243
Inadequate emergency contacts		.4206	.2343	1.5228
History of substance abuse-mother**		.5634	.1895	1.7566
Baby's birth weight, in ounces		-.0051	.0041	.9949
Birth health: Positive drug screen		.9657	.8603	2.6267
Intermediate or intensive nursery care		.0909	.2721	1.0951
Number of living children**		.3115	.1115	1.3654
Number of pregnancies		.0769	.0746	1.0800
Mother lives alone*		.4926	.2230	1.6366
Mother's race/ethnicity (white)***		.6990	.1873	2.0118
Childhood history of abuse/neglect*		.5064	.2007	1.6593
Self-esteem, available lifelines, severe		.1797	.1788	1.1968
Current life stresses/concerns, severe		.2235	.1970	1.2504
Violence potential, severe***		.6635	.1977	1.9415
Discipline attitudes, severe*		.7754	.3077	2.1714
Attachment*		.4307	.2170	1.5384
Expectations for infant		.1672	.3512	1.1820
Constant***		-2.4511	.6689	
-2 Log Likelihood	1109.716			
Goodness of Fit	3072.625			
Model Chi-Square	139.438***			
Degrees of Freedom	19			
Correctly Predicted	94.92%			

N=3147; ***p<.001, **p<.01, *p<.05.
Note: Dependent variable is official report of child abuse and neglect, measured by *substantiated* CPS report.