

The Human Capital Accumulation of Young Mothers:
The Relationship with Father Involvement

by

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ABSTRACT

This study utilized ecological theory and social exchange theory to examine how father involvement effects the human capital accumulation of young mothers. This study used data from a sub-sample of young mothers taken from the Healthy Families Arizona longitudinal evaluation ($N = 84$). The participants in the sub-sample were between 13 and 21 years of age.

Using a random effects regression model, it was found that father involvement negatively affects a young mother's school attendance over time. The probability of a mother attending school when the father is involved decreases by 12%. It was also found that for the average age mother (19 years of age), the probability of attending school decreases by 59% every additional year. Furthermore, for a mother with an average number of children (one child), every additional child she has decreases the probability of attending school by 24%. In addition it was found that for the average age mother (19 years of age) every additional year, the likelihood of being employed increases 2.9 times, and for a mother with an average number of children (one child) every additional child decreases the likelihood of employment by .88 times.

DEDICATION

I would like to dedicate this dissertation to my beautiful daughters Yasmin and Sofia, girls you can do it too! I love you with all my heart!

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Chapter 1

INTRODUCTION

Teen motherhood has been broadly recognized as a major public health and social problem due to its numerous tribulations and negative consequences for the mother and child (Unger & Cooley, 1992). Some of the ramifications of teenage childbearing include low levels of education and poor labor market outcomes for the mother, which can lead to long term poverty (Roye & Balk, 1996; Chevalier & Viitanen, 2003). Additionally, the children of teenage mothers are found to have worse short and long-term outcomes than the children of non-teen mothers (Holmlund, 2005).

Nearly one million teenage girls become pregnant each year in the United States (Sarri & Phillips, 2004). However, not all pregnancies result in a live birth; half of these pregnancies result in an abortion or a miscarriage (Sarri & Phillips, 2004). In 2006 the number of births to teenagers age 15 through 19 was 435,436, and the number of births for teenagers ages 10 through 14 was 6,396 (Martin et al., 2009). The birth rate for teenagers ages 15 through 19 increased by three percent in 2006 from the previous year, interrupting a 14-year period of constant decline in births to teen mothers from 1991 through 2005 (Martin et al., 2009). The rate for the younger teenagers also declined during this same period (Martin et al., 2009). The birth rates for black non-Hispanic and white teenagers 15-19 years increased three and five percent respectively between 2005 and 2006 to 63.7 and 26.6 per 1,000, respectively, while the rate for Hispanic teenagers rose two percent to 83.0 between 2005 and 2006 (Martin et al., 2009). Among the Hispanic

subgroups, Mexican American teenagers continue to have the highest birth rates (Martin et al., 2009).

In Arizona, teenage girls gave birth to 12,916 babies in 2006 (Mrela & Torres, 2009). The rate of teen births was 29.6 per 1,000 in 2006 for the state. The percentage of births to teen mothers in urban counties was 12.3% and was lower than in rural counties which was 14.9%. The disparity by race noted at the national level is also mirrored in the state of Arizona. In Arizona, the 2006 birth rate for white non-Hispanics teen mothers was 18.9 per 1,000, and for African Americans teen mothers it was 32.6 per 1,000 (Mrela & Torres, 2009). The birth rate for Hispanic teens was 56.0 and for Native Americans it was 36.2 per 1,000. Additionally, in Arizona, of the 12,746 live births to teen mothers age 15-19, 59.7% were born to Hispanic teen mothers compared to 33.5% nationally in 2006 (Mrela & Torres, 2009).

Statistics such as these have over the past decades increased the attention of policy makers and the public to the issues of teen motherhood and the consequences faced by teen mothers. It is imperative to find how teen mothers can improve their circumstances. Research has found that supportive social relationships can play a vital role in buffering the stress and helping overcome the hurdles experienced by teen mothers. One of these relationships is the relationship a teen mother has with the biological father (Roye & Balk, 1996). However, there is very little research that has examined how the baby's father involvement affects the educational and labor market participation outcomes of teen mothers. This

study seeks to examine how the involvement of the baby's father affects these human capital outcomes for teen mothers.

Consequences of Teen Motherhood

The consequences of teen motherhood have been established in the research and include completing less schooling, less stable employment, being underrepresented in management and professional employment, and in their early years being largely supported by public funds (McCue-Horwitz, Klerman, Kuo, & Jekel, 1991; Levine-Coley, & Chanse-Lansdale, 1998). The chances of success for the children of teen mothers are affected not only by the circumstances of their birth, and their own abilities, but also by the degree to which their mothers can prevail over the disadvantages of early motherhood (Furstenberg, Brooks-Gunn, & Morgan, 1987)

Teen motherhood conflicts with and affects the human capital investment that usually takes place throughout adolescence by increasing the opportunity costs of time spent in education (Chevalier & Viitanen, 2003). Human capital refers to the accumulation of skills and knowledge that influence the ability to perform labor and earn future monetary income by increasing resources in individuals (Becker, 1993). Human capital investment activities include completing high school, attending a university, or obtaining other post-secondary education and training, and obtaining early work experience (Klepinger, Lundberg, & Plotnick, 1999). When reductions in early human capital investment occur, they are likely to have adverse long-term consequences for the wages, earnings, and employability of the mother. Reduced earnings have considerable

negative effects on total income and consequently on the economic well-being of the mothers and their families (Klepinger, Lundberg, & Plotnick, 1999).

Becoming a mother as a teenager disrupts human capital investment because formal education is curtailed and the mother is kept out of employment for a time, thereby depriving her of valuable work experience (Ermisch, 2003). The low compatibility of employment with the responsibilities of child rearing are also likely to reduce labor market participation and therefore human capital accumulation (Chevalier & Viitanen, 2003).

According to Becker (1993), there is a tremendous amount of circumstantial evidence that testifies to the economic importance of human capital, and in particular, education. According to Becker (1993) the most impressive piece of evidence is that persons who earn more than others are those who are more educated and skilled. Becker (1993) further argues that education and training are the most important investments in human capital because you cannot separate individuals from their knowledge or skills the way it is possible to move physical and financial possessions while the owner remains put. Furthermore, the relationship between teen motherhood, educational attainment, and employment are of importance because modern-day women contribute to the financial well being of their families in addition to fulfilling customary mothering roles (Scott-Jones, & Turner, 1990).

Tomaskovic-Devey, Thomas, and Johnson (2005) stated that persons with more human capital are more attractive employees, because highly skilled individuals are more effective and can accomplish more complex tasks, due to

their higher communication and technological skills. Additionally, people with more human capital are anticipated in the short and long run to be more productive employees, because they can learn new skills with less trouble and move toward peak productivity in a job more rapidly (Tomaskovic-Devey et al., 2005). Furthermore, according to Tomaskovic-Devey et al., (2005) “human capital investment is often not a voluntary, and almost never an individual choice” (p. 61). This type of capital acquisition is a social process. Often parents make educational choices for their children unconsciously with their own decisions and resources (e.g., educational resources, income, which neighborhood to live in, and what school children attend).

Hofferth, Reid, & Mott (2001) conducted a study to examine changes in the consequences of teen motherhood for teen mothers during different historic periods. The researchers were looking for the differences in effects of the timing of motherhood on the schooling for teen mothers in the 1960s/1970s and for teen mothers in the 1980s/1990s. To accomplish this, Hofferth et al., used two data sets: The National Longitudinal Survey of Young Women (NLSYW) and the Panel Study of Income Dynamics (PSID). The NLSYW study focused on the period from 1984 through 1994, and included 4,013 participants.

In the NLSYW sample, 14.4 % of teen mothers identified as black and 85.6% as nonblack, non-Hispanic. Also the study used PSID waves from 1968 through 1995 consisting of 3,562 participants. In the PSID sample, 15.8% identified as black and 84.2 % as nonblack, non-Hispanic. Also Hofferth et al.,

used weights to adjust for the probability of differential levels of attribution and selection throughout the analysis.

Hofferth et al., (2001) found evidence in their study that the effects of early childbearing on teen mothers' college attendance was greater in more recent years, because the probability of attending college has increased for all young women. Hofferth et al., found that teen mothers are not enrolling in college for the most part. The difference between college attendance for early childbearers in the 1990's was 29% versus 73% for their peers who delayed motherhood. Hofferth et al., (2001) argue that the necessity of an advanced education for highly technical jobs makes a college education crucial for today's young women's self sufficiency.

In one study, Chevalier and Viitanen (2003) examined a sample of 5,697 British women to compare women with and without conception spells as teenagers. The researchers used The National Child Development Study for their data. This study is a continuous survey, in which all individuals born in Britain during the first week of March 1958 were requested to participate. The participants had been surveyed at different points in time. Chevalier and Viitanen used the fifth wave conducted in 1991. At this time the participants were 33 years old.

Using an ordered probit model, Chevalier and Viitanen (2003) found a marginal effect (e.g., the slope of the probability curve associated with changes in the dependant variables) which suggest that by age 33, teen mothers were three times more likely than women who were not teen mothers to have no vocational

qualifications (2.8%) or qualifications of low level. Chevalier and Viitanen (2003) also found that teen motherhood not only affects work experience permanently, but adult involvement in the labor force as well, because the presence of children increases the value of domestic work. This appears to have consequences on the career development of women. In the sample six percent of the women were found to not have work experience. Additionally, teen motherhood was found to be associated with a reduction in employment experience of about three years. The findings by Chevalier and Viitanen suggest that the consequences of teen motherhood may be substantial and that teenage mothers have difficulties combining labor market participation and child rearing.

An education is crucial to a young woman's prospects throughout her life. The total education a woman obtains affects her occupation, her risk of poverty, welfare dependence, her quality of life and that of her children (Hofferth, Reid, & Mott, 2001). According to a Brindis and Philliber study (as cited in Freudenberg & Ruglis, 2007), teen motherhood is the leading cause of dropping out of high school for teen females, and approximately 30% to 40% of female teenage dropouts are mothers.

In one study Holmlund (2005) used a sister differences approach to control for unobserved family characteristics to examine the consequences of teenage motherhood on education. Holmlund (2005) used a sizeable Swedish data set made up of a 20% random sample of each cohort born in Sweden from 1974 to 1977. Two different samples were constructed for the study; a sister sample and a random sample. In the data, siblings of the participants in the samples were

identified. Holmlund compared teen mothers with their sisters who had their first child after their teens, or who had no children. The random sample, and the sister sample used in the study consisted of 12,105 participants of which 333 were teen mothers and 340 were sisters to the teen mothers. The rest of the participants were sets of sisters that were not teen mothers. Holmlund found that teen mothers were significantly less educated than their sisters. Additionally, Holmlund found noticeable differences between teen mothers and the women who postponed motherhood. On average, teen mothers had significantly less years of education: 10.65 in contrast to 13.05 years for nonteen child bearers (Holmlund, 2005).

Holmlund's (2005) study made a contribution to the knowledge of the consequences of teen motherhood. Specifically, how teen childbearing incurs a penalty to teen mothers in terms of years of education. It is worth mentioning though that even in a welfare state like Sweden, where teen mothers have access to day care and education they still do not do as well as those teens that postpone motherhood.

Consequences to children

As mentioned earlier, some of the consequences of teen motherhood are low labor market participation and a curtailed education. One of the results of low labor market participation and a limited education is expressed in the home environment that teen mothers provide for their children. Luster and Dubow (1990) argued that a mother's intellectual ability, mediated by other variables such as education and financial status, affects the quality of the home environment of teen mothers, and this experience may be different for different

ethnic groups. Luster and Dubow stated that black mothers are more likely to live in poverty and Hispanic mothers tend to have the lowest education compared to blacks and whites (Luster & Dubow, 1990). According to Burgess (2005) teen mothers provide poorer home learning environments (HLE) for their children because they do not have the financial resources, the motivation, or the know-how to provide a better home learning environment. The HLE is characterized by the parent's activities that expose children to literacy opportunities, and the parent's attitudes toward education and discipline (Burgess, Hecht, & Lonigan, 2002). According to Evans, Shaw, & Bell (2000) the HLE that parents create is commonly believed to play a vital role in the development of their children's language and reading skills. Burgess (2005) argues that the offspring of teen mothers by and large perform more poorly on measures of cognitive competence, but especially on language-based assessments. By the time their children reach elementary school they have a tendency to score lower on achievement tests. Additionally, this function appears to worsen over time for the children of teen mothers.

According to the researchers Jackson, Brooks-Gunn, Huang, and Glassman (2000), teen mothers' low education levels have also been found to be associated with the quality of their parenting. Education level is a vital predictor of earnings, and when there is financial strain due to low wages a person's psychological functioning is impaired. Financial strain has been found to have an association with depressive symptoms. These depressive symptoms, in turn have been found to be linked to less adequate parenting, diminished nurturance toward

children from their mothers, and contribute to risk for behavioral problems in young children (Jackson et al., 2000). Brody and Flor (1998) stated that chronic financial strain has been shown to induce stress, anger, and frustration, and that these responses induce and promote hostile family relationships.

Brody and Flor (1998), contend that on the other hand, more years of formal education have been associated with a more responsive, supportive, vigilant parenting style and with a harmonious parent-child relationship. According to Brody and Flor (1998), a positive parent-child relationship provides children with a sense that they are deserving of affection, and this leads them to a positive sense of self. Furthermore, the likelihood that children develop externalizing or internalizing problems decreases when children have a positive sense of self (Brody & Flor, 1998).

Teen Mothers' Mental Health and Human Capital

According to Trad (1995), the combination of pregnancy as an unplanned event and the teen mother's immature developmental status creates a stressful environment that can trigger postpartum affective disorders (e.g., baby "blues," moderately severe postpartum depression, and postpartum psychosis). Also, nurturing a child during adolescence interrupts normal cognitive and developmental processes and it is often accompanied by factors related to depression (e.g., socioeconomic disadvantage, single motherhood, and lack of social support) (Deal, & Holt, 1988).

Deal and Holt (1988) carried out a study to provide a population-based estimate of the prevalence of depressive symptoms among US adolescent mothers

who had given birth only once, and examined the association between young maternal age and depression. The data were obtained from the National Center for Health Statistics' 1988 National Maternal and Infant Health Survey. The analysis included black and white adolescent respondents that had given birth only once and a comparison group of women 25 to 34 years of age who had given birth only once. The final sample included 447 women 15 to 17 years old, 479 women 18 to 19 years old, and 870 adult women 25 to 34 years old. Deal and Holt found high rates of depressive symptoms among adolescent mothers more than a year after delivery. These rates were substantially higher than rates among adult women.

Research has established that education is positively related to well-being (Williams, Yu, Jackson, & Anderson, 1997). However, in a study Williams, Yu, Jackson, and Anderson (1997), found that education was related to psychological distress for individuals with 12 years of education or less. Williams et al., (1997), used data from the 1995 Detroit Area Study (DAS). The participants were 18 years and older. The sample was made up of 1,139 participants living in Wayne, Oakland, and Macomb counties in Michigan. University of Michigan graduate students conducted face-to-face interviews and obtained a response rate of 70%. The final sample included 520 whites, 584 blacks, and 33 Asians, Native Americans and Hispanics. However, in their study Williams et al., (1997), decided to only use the black and white respondents. One of the goals in the study was to examine how indicators of social class and socio-economic status account for differences in physical and mental health for blacks and whites.

Using regression analysis Williams et al., (1997) found that people with less than a college education have higher levels of distress than college graduates and that women report higher levels of psychological distress than men do. The researchers also found that the education- well-being association fits a linear graded relationship pattern. Individuals with lower levels of education reported lower levels of well-being than individuals in the category just above them.

According to Williams et al., (1997) education and job experience mediate social class (e.g., supervisor, manger) because these can potentially determine the type of jobs individuals perform. Williams et al., (1997), using their three social status model found evidence that individuals in positions that require less education, and less job experience have more distress due to their job. The researchers found that supervisors reported higher levels of distress than managers.

Teen Mothers and Social Policy

Teen motherhood has been recognized as a social problem. Often social problems are addressed through social policy. The public concern for teen motherhood emerged in the 1970s. It was at this time that society and policy makers considered it a social issue even though teenage pregnancy and childbearing had peaked two decades earlier (Vinovskis, 2003). In the 1950's welfare was not associated by the public with teen motherhood as it is today, because most teen girls who got pregnant quickly married to legitimize their children. According to Weatherly (1987) the federal policy concentration on teen pregnancy and motherhood resulted in part from its identification as a problem of

middle class whites, which was a transition from it being considered a black phenomenon. What is more, in the 1970s there was a sizeable increase in the proportion of births to out-of-wedlock teens (Vinovskis, 2003; Weatherley, 1987; Montessoro & Blixen, 1996). According to Montessoro and Blixen (1996) policy makers' new concerns about teen pregnancy and motherhood stemmed from the challenge to the prescribed norms of marriage and motherhood.

With the increase of teen out-of-wedlock births, welfare expenditures increased through programs such as Aid to Families with Dependent Children (AFDC) (Vinovskis, 2003). Under the entitlement AFDC system, teen mothers received cash assistance, and automatically were eligible to receive in-kind benefits such as Medicaid, food stamps, surplus food, housing, and social services for as long as they were financially eligible, or demonstrated need as defined by federal law. The amount of cash assistance teen mothers received was based on the number of persons in the family (Dear, 1989). Also, if a teen mother had another child while receiving AFDC, the mother would receive additional assistance for the new child (Moore & Burt, 1982).

Under AFDC, if a teen mother had not finished high school she could receive education and job-specific training. However, even though the Family Support Act of 1988 required all AFDC teen mothers to attend school to finish their high school education or to seek job training, this requirement was not really enforced (Vinovskis, 2003). The comprehensive care programs offered to teen mothers did include education as a core service, but it was left to the local unit's discretion to define how this should be put into service (Vinovskis, 2003). On

many occasions, teen mothers were encouraged to pass the GED examination rather than completing a regular high school education (Vinovskis, 2003). Another benefit to teen mothers was that receiving AFDC assistance allowed them to be independent from their parents and their parents' control (An, Haveman, & Wolfe, 1993).

The new controversial Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) was passed in August of 1996. It ended the 61-year federal entitlement system that had no caps and that guaranteed cash assistance and in-kind social services to all eligible poor females and their children (Vinovskis, 2003). The PRWORA set up the Temporary Assistance for Needy Families (TANF) program that replaced AFDC and in doing so, it included provisions intended specifically for teen mothers and would-be teen mothers. In order to be eligible for TANF, teen parents have to fulfill the Teen Parent Live-at-Home and Stay-in-School Requirements. These requirements entail that an unmarried minor parent participates in education and training activities, and resides with a responsible adult (generally the parents) or in an adult-supervised setting. The states are accountable for helping to locate adult-supervised settings for teens who cannot live at home for safety reasons (Acs & Koball, 2003). In addition, advocates of the policy believed that if teen mothers complied with these requirements these would lead to increased earnings and educational attainment for young mothers (Kalil & Danzinger, 2000).

There are other factors that affect teen mothers under TANF. Teen parents who were determined to be heads of households by the state or who were married

to heads of households were affected by the 60-month time limit imposed by TANF. Under TANF there are no child care provisions for teen mothers. However, a state can exempt a teen mother or a mother of any age with a child under the age of one from participating in required activities. Furthermore, if a teen mother refuses to work because she does not have childcare and can demonstrate it, a state is prohibited from terminating or reducing her TANF benefits (Levin-Epstein, 1997).

Nowadays it is easier for teen mothers to complete high school than in the 60's and 70's, because there are more programs for teen mothers to finish high school or obtain a GED. But the same is not true for matriculation in college. By and large, public programs for teen mothers end with high school completion. Today, teen mothers receiving TANF must work at least 20 hours per week after they have completed high school. This requirement may be an obstacle for teen mothers to continue their education. However, in the past teen mothers receiving AFDC welfare benefits could enroll in college if they wished to do so (Hofferth et al., 2001)

Furthermore, the four purposes of TANF include: “1) the assistance of families in need so that they can take care of their children in their home. 2) The reduction of dependency of families by encouraging job training, work, and marriage. 3) The prevention of out-of-wedlock pregnancies. 4) The promotion, formation, and maintenance of two-parent families” (U.S. Department of Health and Human Services, Office of Public Affairs, 2006). A very important provision of the TANF legislation was to grant states a high degree of autonomy in the kind

of welfare program each could offer. In 1999, all states had an official policy requiring or encouraging pregnancy prevention programs in the public schools. Moreover, many states have pursued a policy of devolving authority over teen pregnancy prevention programs to local organizations (Wertheimer, Jager, & Anderson, 2000). Some states such as North Carolina authorized adolescent parenting programs that aimed at reducing the negative impact of adolescent pregnancy for teen mothers and their children. These programs provided health care for the teen mother and her child, and discouraged second pregnancies by offering birth control, and provided parent and job training (Jimenez, 1998).

Another policy response to teen parenting has been the identification of risk factors for teen mothers and the provision of home visitation programs. These home visitation programs have various goals. Some of these goals include the prevention of child abuse and neglect, and the mobilization of resources. Some of the programs also seek to improve the lives of the parents by encouraging them to defer subsequent pregnancies, return to school, or find jobs (Gomby, Culross, & Behrman, 1999; Sweet & Appelbaum, 2004). Nevertheless, they impart the value of children's early years and the belief that parents mediate changes for their children's lives. Traditionally, home visitation programs have worked with mothers more than with fathers, but currently more programs are likely to involve mothers and fathers (Sweet & Appelbaum, 2004). Home visitation programs are funded by public and private dollars from sources such as Title I, TANF, and various foundations (Gomby, Culross, & Behrman, 1999). Examples of some of the home visitation models that are being implemented nationally include: The

Comprehensive Child Development Program (CCDP), The Nurse Home Visitation Program (NHVP), and Healthy Families America (HFA) (Gomby, Culross, & Behrman, 1999).

In Arizona a very important policy is the Title X of the Public Health Service Act. This federal policy is devoted solely to the provision of publicly supported family planning services and supported 40 family planning clinics in Arizona. These clinics had served 46,730 women, including 15,040 teen mothers by 2009 (Guttmacher Institute, 2009). Additionally, the Arizona Coalition on Adolescent Pregnancy and Parenting (ACAPP) is dedicated to the reduction of teen pregnancies and the improvement of lives of teen mothers and their children. This nine-year-old non-profit organization promotes and advocates for pregnancy prevention programs, parenting programs, and collects data on the cost of teen pregnancy for the state of Arizona (The Arizona Coalition on Adolescent Pregnancy and Parenting, 2006).

Family planning services: Title X of the Public Health Service Act

Congress enacted Title X of the Public Health Service Act in 1970. This federal program was created solely for the provision of family planning services nationwide. In the present day, through Title X the establishment and maintenance of the nationwide network of family planning clinics is financed. Title X also subsidizes the delivery of contraception services to individuals who lack another source of payment (Benson-Gold, 2001; Dallard, 2002). Title X sets the standard for the distribution of publicly funded family planning services and supplies in the United States. Many teens receive services at Title X funded

clinics and fees are based on the teens' income instead of their parents' income. Teens receive confidential care but they are encouraged to talk to their parents. Title X services are completely voluntary and Title X funded clinics are prohibited to pay for abortions (Benson-Gold, 2001). Additionally, Title X guidelines require that family planning providers discuss postponing sexual activity and abstinence with all adolescent clients (Dallard, 2002) According to Benson-Gold (2001) clinics funded by Title X have contributed tremendously to the reduction of unintended pregnancies and abortions in the United States. What is more, these clinics have played a very important role in reducing and avoiding pregnancies amongst teenagers.

Medicaid Title XIX

The Medicaid program was formed by the Social Security Amendments of 1965. A number of states joined immediately in 1966, however, Arizona was the last state to join Medicaid in 1982 (Gruber, 2000). Medicaid funding is provided by Title XIX of the Social Security Act and does not require reauthorization by Congress (Gruber, 2000). The Medicaid program provides health insurance services to low income populations. This entitlement program is a federal-state venture that reimburses providers for services rendered to eligible individuals. Although some social programs are grant programs, there is no federal ceiling on Medicaid (McFarlane & Meier, 1998; Hill & Macan, 1996; Friedlaender & Alessandrini, 2004).

In the past individuals receiving AFDC were automatically eligible for Medicaid, but in 1996 with the decentralization of welfare under TANF, Medicaid

was delinked (McFarlane & Meier, 1998). Today eligibility for Medicaid is based on income, age, family structure, and assets (Gruber, 2000). However, policies as liberal as those in the past under AFDC rules are used to determine eligibility to Medicaid (Acs, Coe, Watson, & Lerman, 1998). Pregnant women whose family income is less than 133% of the federal poverty level are eligible to receive Medicaid as are individuals whose medical expenses reduce their income to the poverty level set by the state they live in (Friedlaender & Alessandrini, 2004). But the potential loss of Medicaid benefits can dissuade families from working. Policy makers have put in place health coverage benefits such as state programs to help Medicaid-ineligible, low-income families with transitional benefits, and have expanded the availability of health coverage for children to minimize the work deterrents in the Medicaid program (Acs et al., 1998).

Recently, it has been recognized that another disadvantage children in teen families have to confront is father absence. By not having a father at home many children experience additional disadvantages, such as less income for their household and smaller social networks that can offer better life opportunities.

The Importance of Fathers

The effects of father loss are more profound for a child when the parents separate voluntarily than when the father absence is due to paternal death (Amato & Keith, 1991). According to King, Harris, and Heard (2004) various studies have established that children who are raised apart from their fathers can be disadvantaged in many ways. These children are more likely to engage in drug use and alcohol use, unprotected sex, and cigarette smoking. In addition, they are

less likely to graduate from high school, and are more likely to experience teenage parenthood, have lower levels of psychological well-being, and have lower earnings. An important disadvantage that results from not growing up with a biological father is the potential loss of social capital.

Social capital

Children benefit from having their fathers in their lives. The social capital that the father provides to his children is crucial for their quality of life as well (King, Harris, & Heard, 2004) Social capital refers to the time, parental guidance, attention, and social connections that a father can provide for his child. The loss of social capital by children that do not grow up with their biological fathers is often not compensated for by other adult males in the child's life (King, Harris, & Heard, 2004). Social capital comes in two forms and they are equally essential to child well being. In the first form, social capital is inherent in father-child relations as fathers monitor, nurture, and care for their children. The quality of the father-child relationship is an elementary source of social capital that is particularly vital for children's school attainment and their avoidance of risk behaviors (Astone & McLanahan, 1991). In the second form, social capital is inherent in the relationship between the father and other individuals and institutions in the community. These associations provide access to opportunities, assistance, information, and resources in the community that cultivate the healthy development of children (Coleman, 1988).

It is also important to note that fathers appear to engage in different types of interactions with their infants than mothers do. For example, fathers tend to

have a tendency to provide bursts of physical and social stimulation to their babies, whereas the mother tends to be more rhythmic and containing (Lamb, 2002). Fathers may be more responsive to motor cues, and are more likely to stimulate and play with their infants than mothers are. Mothers appear to engage in more caretaking activities (e.g., feeding, bathing, and changing diapers, and clothes), than fathers. Overall, fathers and mothers do not simply play differently, but play is an especially salient component of father-child relationships (Lamb, 2002).

When a woman gives birth, it is a time when social networks offering practical, emotional, and financial support become enormously important (Kidger, 2004). The importance of these social networks is even more vital for teen mothers because they are facing more challenges than nonteen mothers. When a teen mother remains involved with a baby's father, the father's family may provide an additional source of support and potentially bring with them additional social networks that can increase the teen mother's social capital. In this circumstance, social capital refers to help with child care, finances, and social connections that are available to the teen mother. According to Johnston and Percy-Smith (2003), family ties that are strong and stable are an important source of social capital because the family is concerned with furthering individuals in the family. Additionally, social capital in the form of social networks can help improve the quality of life and the life-chances of individuals by contributing to higher levels of educational attainment, and promoting access to employment and other opportunities (Johnston & Percy-Smith, 2003).

Conclusion

In this age of technology, human capital is more important for women than in the past. Many women are either heads of households or they are part of a two-income family. In order to work at a job that pays more than the minimum wage or that is not a low prestige job, post-secondary education is needed. However, there are still many teen mothers that are not graduating from high school, or if they graduate from high school they are not attending college. It is of great importance that teen mothers get an education because that could lead to higher wages. Having higher wages could help alleviate some of the stressors they can potentially face in their lives, and will allow them to provide a better quality of life for their children.

Social policy makers have recognized the fact that many teen mothers are not graduating from high school, are not participating in the labor force, and are having more out-of-wedlock children. In an effort to encourage teen mothers to finish high school, and move on to employment, social policy makers addressed this issue when TANF was created in 1996. Teen mothers receiving TANF benefits are required to live at home, go to school, and after graduating from high school, or obtaining a GED, they are required to participate in at least 20 hours a week in the work force. Additionally, social policy makers imposed caps on benefits to teen mothers' children, by not allowing additional money for children born to teen mothers after they were receiving TANF. The purpose of this cap was to discourage teen mothers from having more children. Social policy makers

also designated TANF grant money for anti teen pregnancy programs and abstinence programs to discourage early parenting.

As previously stated, most research on teen mothers is deficit based or looked at with a negative lens. Social work as a profession has embraced the strengths perspective and the idea of risk and resilience, which states that even in the presence of risk some individuals do prevail, and the question is what factors lead to resilience. Not all teen mothers have unfavorable outcomes and just because they had children at a time when they were supposed to be developing mentally and physically themselves they are not destined for a life of misfortune, poverty, and failure. Many individuals that come from humble beginnings and difficult circumstances have prevailed, and have obtained some level of success in their lives. It is possible that some teen mothers are resilient individuals and that having a child in their teen years does not prevent them from realizing their personal dreams and goals. Some mothers may want to succeed for their children's sake, their families, or themselves. Some mothers may have the right people around them to keep motivating them and encouraging them to go to school or go to work. One of these right individuals could be the baby's father.

There is growing research on father involvement that focuses on the father-child relationship and outcomes. This research points to the benefits of father involvement for their children. However, there is a dearth of research on the impact of father involvement on adolescent mothers' education attainment or labor participation.

Therefore, the purpose of this study is to examine the factors that lead to resilience in teen mothers with an emphasis on how father involvement affects the human capital accumulation of teen mothers. The general research question is: How does the involvement of the baby's biological father affect the human capital accumulation of teen mothers? Another goal of this study is to add to the already existing research on teen motherhood and human capital accumulation, as well as, adding to the existing research on father involvement. In the next chapter the literature on human capital attainment of teen mothers' is presented with a focus on father involvement.

Chapter 2

LITERATURE REVIEW

This chapter will present a review of relevant literature about teen motherhood and human capital accumulation. Additionally the theories that will be used for the study will be presented. First, social exchange theory will be discussed. Subsequently, ecological theory will be introduced, and then it will be used as an organizing framework for this chapter. Research on the factors influencing teen mothers' human capital accumulation will be presented. Then, a summary, and the limitations of teen mothers' human capital accumulation studies will be offered. This chapter concludes with the specific research question and hypotheses that resulted from this review of the literature.

Social Exchange Theory

Social exchange theory stemmed from what is known as “utilitarian thinking.” Utilitarianism refers to several categories of theory that share a common premise. This premise is that humans are motivated and act so as to maximize those outcomes they most value (White & Klein, 2008). Social exchange theory also proposes that humans evade costly behavior and seek out rewarding statuses, relationships, interaction, and feeling states to the end that their profits are maximized. What is more, in seeking rewards, individuals of their own free will accept some cost, and similarly in avoiding cost, some rewards are renounced. But individuals will select the best outcome available, based on their perception of rewards and cost (Nye, 1979).

Rewards refer to all things physical, social, and psychological that individuals enjoy and experience satisfaction, pleasure, or gratification from (e.g., relationships, interactions, and experiences) and that individuals would choose in the absence of added cost. The costs refer to any relationship, interaction, feeling milieu, or status that an individual disliked. Costs include two distinct classes of phenomenon. One class is termed punishments, and this could include persecution, distrust, repugnance, stigma, or social disapproval. The other class is termed rewards forgone and this includes rewarding positions, relationships, interactions, feelings, or milieu forgone because a competing alternative was chosen (Nye, 1979).

Overall social exchange theory is a voluntaristic theory and this insight led Nye (1979) to pronounce that this theory is about choice. In the early stages, basic principles of the theory were formally stated in propositional form along with a sizable number of basic assumptions of exchange and of choice. Initially, social exchange theory was centered on the face-to-face interaction and relationships in the dyad and triad. Later the theory grew into a general theory of human behavior and social structure. At this time, cultures, institutions, and groups of various sizes were added (e.g., ethnic groups, banking institutions) along with the appropriate basic assumptions to address these groups.

The assumptions covered concepts like reward, costs, and reciprocity that were not limited to two-person exchanges even though most of the early social exchange work focused on that level (Nye, 1979). Overall, the assumptions imply that group phenomena, social structure, and the normative culture are

constructions of the individual. Therefore, if we understand the actions of the individual, we will additionally understand these macro social phenomena (White, & Klein, 2008).

Heath (1976) explains that there has been a bitter debate about the applicability of an economic theory to the economics of society. Because there are exchanges between members of a society that have a different moral social exchange than those of the theory. The proponents of social exchange theory respond to these arguments by stating that social exchange theory is pervasive but is not all-inclusive. The proponents of the theory state that any behaviors motivated by a sense of duty or other internalized value are excluded from the conception of social exchange theory (Heath, 1976).

According to social exchange theory, humans live in a world of scarcity and therefore must select between alternative courses of action. Furthermore, an exchange between individuals will only occur if both parties believe that the exchange will provide them with more utility than any other open option. Therefore, at the center of the exchange is something that each side wants. This exchange enables both parties to be better off than they would have been without the exchange (Heath, 1976).

One of the major contributions of social exchange theory is the concept of power-dependence relations (Molm, 1987). This concept is based on the idea that one person's power resides in the dependency of another. The concept of power-dependence has two characteristics. 1) The structural characteristics of the relations between persons rather than individual characteristics of one person

determine the power. 2) However, power and power use are conceptually discrete. Power is a function of a structural position that gives an individual control over another individual's outcomes. On the other hand, power use refers to control over another's behavior (Molm, 1987).

According to Nye (1980) social exchange theory has evolved to the point that it can address the broadest problems of social structures and human behavior. He states that humans are discrete entities and a composite of the groups in which they are members. However, the sociology of individuals is reduced to statements of rewards, cost, and goodness of outcomes. One advantage of the theory is that the greater explanatory power of exchange theory stimulates additional testable hypotheses (Nye, 1980).

Critics of social exchange theory have made charges of reductionism, assumed rationality, and tautological reasoning. The critics make these charges because they find conceptual confusion and debate concerning issues of tautology, rationality in social behavior, and reductionism in the strategy of explanation (Emerson, 1976). According to Emerson (1976) this confusion stems from a failure to honor the integrity of social relations as a unit of analysis by the critics of social exchange theory. Emerson (1976) further argues to make this point clear, that three different units of empirical observation need to be considered: "actions by individuals; transactions between individuals; and exchange relations as series of transactions between the same individuals" (p. 346).

In spite of what critics have stated, researchers have used social exchange theory to guide their investigations and the development of prevention programs. Zimmerman (1988) has used social exchange theory to analyze the relationship between state level public policies and state teen birthrates. Zimmerman (1988) found a relationship between state level policy choices and teen birthrates. States that have lower expenditures for both education and public welfare have greater teen pregnancy rates, lower school completion rates, and higher poverty rates than those states that have higher expenditures in education and public welfare.

Brown, Saunders, and Dick (1999) highlight the problems associated with secondary pregnancy in adolescence and describe an intervention program the researchers established. The Dollar-A-Day program was planned, conceptualized, and implemented using social exchange theory and adolescent development theory. The program was intended to prevent secondary pregnancies among adolescents. During the first five years, of 65 adolescents enrolled in the program only 10 became pregnant. This constituted a 15% repeat pregnancy rate. According to Brown et al., (1999) The Dollar-A-Day program's rates were substantially lower than the 30%- 35% reported by other prevention programs in the U.S.

When applying social exchange theory to the question, of how the father's involvement from the baby's birth affect the human capital accumulation outcomes of the teen mother the concepts of cost, reward, and choice have to be considered when developing the hypotheses that could potentially answer this question. According to White and Klein (2008) the majority of exchange theories

endorse the idea that profitable exchanges are valued and maintained. This fact appears to suggest that those in such exchanges have resources to exchange in the form of social capital, human capital, or economic resources.

Having stated that, it is also important to consider other aspects of the relationship between the adolescent mother and the father of her child, because the relationship is very complex. Social exchange theory poses that human beings make choices based on rationality. However, the choices that adolescents make are not always considered rational because they have many developmental changes taking place at the same time (e.g., cognitive, emotional, and physical). Furthermore, adolescents often do not make choices based on “utility” because of their inability to foresee the long term consequences of their actions.

Ecological Theory

The theory that is used as an organizing framework in this study is ecological theory. In this theory, people and their environments are viewed as unitary systems within particular cultural and historical contexts. Ecological theory posits that individuals and their environments can only be fully understood in terms of their relationships, in which each continually influences the other. For this reason, all notions resulting from the ecological perspective refer not to environment alone, or person alone; instead, each concept defines a particular person and environment relationship, whether it is positive, negative, or neutral (Germain & Gitterman, 1995). Human beings are viewed as developing and adapting through transactions with all elements of their environment. An ecological model explores both factors internal and external to the individual to

accomplish a holistic perspective. Furthermore, ecological theory views individuals, families, and small groups as having transitional problems and needs as they move from one life stage to another (Germain & Gitterman, 1995).

Bronfenbrenner adapted ecological systems theory to human behavior from the physical sciences (Corcoran, Franklin, & Bennett, 2000). According to Bronfenbrenner (1979), the ecological system is like a set of nested structures, each inside the next, like a set of Russian dolls. The developing person's immediate setting is at the inner most level. Bronfenbrenner (1979) defines development as the human being's evolving conception of the ecological environment, and his/her relation to it, as well as the human being's growing capacity to discover, sustain, or alter its properties.

Bronfenbrenner's (1979) ecological systems theory proposes a framework for the ecology of human development because it focuses on the phenomenon of development-in-context. At the center of this ecological orientation is a concern with the gradual adaptation between a growing human organism and its immediate environment. As well as, and the way in which this relationship is mediated by forces originating from more distant regions in the larger physical and social milieu.

In this ecology of human development the individual is not viewed as a "tabula rasa" on which the environment makes its impact, but as a growing, dynamic, being that gradually moves into and restructures the milieu in which it exists. Furthermore, since the environment also exerts its influence, which requires a process of mutual accommodation, the interaction between the

individual and environment is viewed as two-directional and characterized by reciprocity. In addition, the environment is not limited to a single, immediate setting but is extended to incorporate interconnections between such settings as well as to extend influences originating from the larger surroundings. The ecological environment is devised topologically as a nested arrangement of concentric structures, each contained within the next and extends far beyond the immediate situation directly affecting the developing individual and the objects to which she/he responds or the people with whom she/he interacts on a face-to-face basis (Bronfenbrenner, 1979). These structures are the: microsystem, mesosystem, exosystem, and macrosystem.

- A microsystem includes activities, roles, and interpersonal relationships which are experienced by the individual in a specified setting with specific physical and material characteristics. Some examples in this domain include family, romantic relationships, and friendships.
- A mesosystem include the interrelations among two or more settings in which the individual actively participates. For example interaction between home and school and school and place of work.
- An exosystem refers to one or more settings that do not involve the individual as an active participant, but in which events occur that affect or are affected by what happens in the setting containing the

individual. Examples in this area are policies, neighborhood, and community context.

- The macrosystem includes the cultural values and variables that affect individuals along with any belief systems or ideology. For instance, customs, life-styles, social class, and belief-systems (Bronfenbrenner, 1979; Bronfenbrenner, 1994).

Ecological transitions occur whenever a person's position in the ecological environment is altered as the result of a change of role, setting, or both (e.g., arrival of a younger sibling, entry into school, graduating, finding a job, marrying, having a child, retiring). According to Bronfenbrenner (1979), roles have a magic like power to alter how a person is treated, how she/he acts, what she/he does and thereby even what she/he thinks and feels. However, the environmental events that are the most immediate and powerful in affecting an individual's development are activities that are engaged in by others with that individual or in her/ his presence. Once the individual engages in analogous activities, this provides evidence that development has taken place in the form of a newly acquired molar activity (e.g., talking, walking, and reading). These molar activities constitute both the internal mechanism and the external expression of psychological growth (Bronfenbrenner, 1979).

When applying ecological theory to the issue of the human capital accumulation of teen mothers, variables that are part of the microsystem, mesosystem, exosystem, and macrosystem need to be explored. For example personal goals and aspirations are part of the microsystem, as well as, the teen

mother's relationship with the father. Schools are part of the mesosystem, because schools are part of the mother's social network. Social welfare agencies are part of the exosystem because their policies can potentially affect teen mothers.

Another example of a variable is race. This variable is part of the macrosystem because race is expressed the most in terms of culture.

Ecological theory can assist in organizing and synthesizing the variables to be used in research as well. The framework of ecological theory also lends itself to study the effects of the father's involvement on the human capital accumulation of teen mothers. Factors in the teen mother's environment that she has an influence on, as well as factors that she does not, can be examined (e.g., public policies, support systems). These factors can potentially contribute to the teen mother's adaptation to her environment and contribute to the interactions between the teen mother and the baby's father. What is more important is that the basic unit of analysis of the ecological theory is the dyad or two-person system (e.g., the interaction, or lack of interaction between the teen mother and the baby's father) (Bronfenbrenner, 1979).

Another reason why ecological theory is helpful in examining the effects of the baby's father involvement on the human capital accumulation of the teen mother is because the ecological perspective's strong conceptual appeal in terms of how people interact in their environment has the potential to generate new knowledge about sources of strength in the environment. According to Green (1991), researchers have emphasized the importance of examining person-environment transactions within a complete context, rather than explaining

phenomena simply by categorizing them. Green states that because a key assumption of the ecological perspective is that individuals and environments influence each other, the concepts of transactions, goodness of fit, and adaptiveness are central when using ecological theory for research (Green, 1991). Adaptive or maladaptive transactions refer to a mutuality of influence between the individual and the environment, as well as the fusion of the individual and the environment into a unit, relationship or system. Transactions can generate stress if individuals experience a lack of fit. Goodness of fit refers to the extent to which there is a match between people's adaptive needs and the qualities of their environment over time, and it occurs when a preponderance of person-environment transactions are successful, and adaptive. In ecological theory, adaptiveness is considered as a process within the person-environment unit, involving an active exchange between an individual and environment. Adaptiveness focuses on the extent to which the environment is supportive or stress-producing (Green, 1991).

Proponents of ecological theory maintain that the core mission of ecological theory is to help assess the nature of the ecological level of fit between an individual's needs, capacities, on one hand, and on the other the environmental resources and expectations (Wakefield, 1996). Other ecological thinkers have maintained that one of the strengths of ecological theory is its concept of adaptation of individuals over the life span and how individuals survive and develop satisfactorily (Green, 1991).

Corcoran (2000) used ecological theory as an organizing and synthesizing framework to review research on teen sexual activity. According to Corcoran, ecological theory can be utilized to organize the person-environment factors so that knowledge building and intervention can take place at the appropriate systems level (Corcoran, 2000). Other researchers have used ecological theory successfully to guide their research when studying teen mothers (e.g., Chase-Landsdale, Brooks-Gunn, & Paikoff, 1992; Corcoran & Franklin, 2002; Meyers & Battistoni, 2003). The literature presented in the remainder of this chapter will be organized using the ecological theory.

Microsystem

When describing a microsystem the best term is experienced. The microsystem includes objective properties of the environment, as well as the way the environmental properties are perceived or experienced by an individual in the environment. The aspects of the environment that have the most influence on an individual's psychological growth are those that have the most meaning to a person in a given situation (Bronfenbrenner, 1979).

Teen mothers' mental health in relation to father involvement

Gee & Rhodes (2003) studied the roles of biological fathers in the lives of 218 minority teen mothers during the first three years postpartum. Data were collected from an alternative school for pregnant and parenting adolescents, located in a large Midwestern city. The participants were predominantly African American (95%) and 5% were Hispanic/ Latina. Gee & Rhodes (2003), found that at three years postpartum the relationships with the fathers were, in general,

less supportive and less problematic than around the time of childbirth. Their results indicated that father support was not associated with adolescent mothers' psychological adjustment, but father absence was positively associated with both depressive symptoms and anxiety. There was no established research found related to how teen mothers' mental health impacts human capital accumulation.

In their study Gee and Rhodes (2003) obtained all their information about the biological father from the teen mothers. This could pose a problem when interpreting the results because the researchers only have information on the mothers' perceptions and not the fathers'. Additionally, another drawback when interpreting the results is that the study was composed of mostly African American teen mothers and a small percentage of Latina teen mothers. In the African American community as well as in the Latino community, the family is extremely important. The characteristics of both communities are different than the European American community. The involvement of the biological father could possibly not be as important for African American teen mothers who can rely on an extended family and church-based network. On the other hand, Latino teen mothers are more likely to be married and rely a lot more on the father (Gee & Rhodes, 2003).

Conduct disorder

Zoccolillo, Meyers, and Assiter (1997), conducted a study to investigate if a significant proportion of teenage mothers suffer from conduct disorder.

Zoccolillo et al., used a nonclinical sample of 26 teenage girls who were pregnant or had just given birth. The participants lived in the panhandle region of Texas. In

the sample 14 girls were referred by a high school for pregnant girls and teen mothers. Another 14 girls were referred by a Maternal Infant Health Improvement Act program (MIHIA). The last two girls were referred by a local hospital. The ages of the participants ranged from 13 years of age to 17 years of age. In the sample 16 were non-Hispanic white, two were of Hispanic origin, three were non-Hispanic black, two were of Hispanic-origin black, and three were American Indian. The participants were interviewed by the researchers in the latter part of 1991 using the National Institutes of Mental Health (NIMH) Diagnostic Interview Schedule, Version III- Revised (DIS-III-R). Zoccolillo et al., (1997), found that nine girls in their sample were diagnosed with conduct disorder, and 17 were not. Zoccolillo et al. (1997), argue that girls with conduct disorder lead chaotic lives and that dropping out of school, and poor job history are consequences of conduct disorder. The researchers further argue that a high proportion of teen girls with conduct disorder became pregnant. Abrahamse, Morrison, and Waite found in a study (as cited in Zoccolillo, Meyers, & Assiter, 1997), that conduct disorder and deviant behavior in teen girls were associated with a clear desire to be pregnant.

The study conducted by Zoccolillo et. al., (1997) found evidence to propose that a high proportion of girls with conduct disorder become pregnant, however, their sample was rather small and to attempt to generalize such findings a larger randomized sample would be needed. Furthermore, the sample consisted of teen mothers who were receiving public assistance and it is obviously not representative of all teen mothers.

Substance abuse

The use or abuse of legal, as well as illicit substances (e.g., alcohol, drugs), by teen mothers may be an important factor contributing to the unfavorable outcomes that have been established for teen mothers and their children (Barnet, Duggan, Wilson, & Joffe, 1995). According to Belcher and Shinitzky (1998) the use of alcohol and drugs in the adolescent population carries a higher risk for school underachievement, poor self image, and abuse. Teagle and Brindis (1998), argue that the estimates of substance use among pregnant adolescents range from 11% to 52% and that white pregnant teens rates of substance use is higher than among any other racial group. Teagle et al., (1998) also stated that many teen mothers stop using substances during pregnancy. However, the burdens that teen mothers experience soon after the baby is born may lead some teen mothers to resume substance use (Barnet et al., 1995). According to Trad (1993) teen mothers are attracted to illegal substances because of the escape they provide from everyday responsibilities. Nevertheless, drug use during the teen years may seriously compromise academic performance, interfere with career goals, and perpetuate defeating behaviors.

Barnet, Duggan, Wilson, and Joffe (1995) conducted a study to determine the prevalence of alcohol and drug use among adolescent mothers in the first four months postpartum. Barnet et al., collected data from 110 adolescent who attended a comprehensive adolescent pregnancy and parenting program in a large inner-city teaching hospital. The participants were predominately black and their mean age was 16.3 years of age. The data were collected through urine drug

screens and self-administered questionnaires. Barnett et al., (1995) found that almost 42% of the participants screened positive for one of eight illicit drugs at a postpartum visit or reported using alcohol since delivering their baby. The researchers found that marijuana was the most prevalent drug used. There was also a statistically significant difference in the age of users and nonusers. The participants that were using drugs were 7.2 months older than the participants that were not using drugs. Additionally, the fathers of the children of teen mothers who were users also tended to be older. However this finding did not reach statistical significance.

The findings for the Barnett et al., (1995) study can be put in question by researchers. Barnett et al., (1995) did not use a randomized sample. In addition, the participants could have been referred to the parenting program because they were high risk teen mothers, and due to that fact, the results could have possibly been compromised. What is more, the participants were given a self-administered instrument and there is a possibility that they underreported their drug/alcohol use because they thought it socially undesirable. Moreover, the participants resided in an urban area and could possibly have more access to illicit substances than teen mothers that live in rural areas. This could pose an issue with the ability to generalize Barnett et al., (1995) findings. The demographic characteristics of the participants can also limit the ability to generalize Barnett et al., (1995) study findings because 93% in the sample were African American teen mothers from economically disadvantaged backgrounds.

Mother's age at first birth and number of children

The timing when a woman experiences her first birth plays a significant role in the amount of schooling a woman obtains (Hofferth et al., 2001). Teen mothers who were older at the time of their pregnancy have been found to have higher levels of education than teen mothers who were younger at the time of their pregnancy (Scott-Jones & Turner, 1990). Boden, Fergusson and Horwood (2008) maintain that irrespective of family background and personal factors, teen motherhood creates significant obstacles to teen mothers' participation in education and involvement in the work force.

Teen mothers are likely to have additional unplanned or unwanted births. The number of children a teen mother gives birth to affects later educational attainment. It has been suggested that limiting the total number of births may be related to a teen mother fulfilling her education and occupational roles (Scott-Jones & Turner, 1990; Brown, Saunders, & Dick, 1998). What is more, according to Ermisch (2003) the main determinant for labor market participation is the number of children a mother has and what ages they are. Those mothers with children under three years of age tend to not participate in the labor market or participate sporadically.

Jones and Mondy (1994) conducted a study to describe the birth patterns of a five-year period of three groups of teen mothers who had a first birth in 1984 to 1985. These teen mothers were receiving different amounts of prenatal intervention for the index birth. Jones and Mondy (1994) used a quasi-experimental research design, in which a retrospective comparison group was

used. The data were gathered from three agencies and all 216 participants were African American, under 18 years of age, single, and of low socioeconomic status. The mean number of births for the sample was 2.2 and 41% of the teen mothers had two births. Approximately 30% had a third or fourth birth within five years of the index birth.

Jones and Mondy (1994) found it difficult to obtain school data over the 5-year period, but were able to retrieve return-to-school data for 148 participants (68%). Jones and Mondy (1994) found that the lower the grade at first birth, the less like a teen mother was to complete high school. The researchers also found that the younger the age at first birth, the less likely to have graduated from high school. Furthermore, Jones and Mondy (1994) found evidence indicating that the total number of children a teen mother had was also related to graduating from high school. In their study 44% of teen mothers with one child graduated from high school compared with 27% of teen mothers with two or more children.

One of the limitations of the study is that the interpretation of the findings cannot be generalized because of the demographic characteristics of the sample used. However, with their study, Jones and Mondy (1994) shed light on the relatively high incidence of teen mothers having second and third births and who do not graduate from high school within five years.

Gender roles

Fine and Zane (1991), from the University of Pennsylvania used two independent data sources to explore the consequences of dropping out of high school for low-income teen females and to critically examine the exceedingly

high dropout rates of teenage girls in a metropolitan area. One of the data sources was from an intensive ethnographic investigation of a public comprehensive high school in New York City, in which a 1978 cohort composed of 1,430 ninth graders was tracked archivally through graduation or discharge. They interviewed 40 recent and 15 long-term high school dropouts, analyzing materials, biographies, short stories and displays hung in the public spaces of the high school. The teenagers in the ethnographic study were predominantly black and Latina from Harlem, New York. The second data source was from focus group interviews in which 80 teen females were interviewed. During these interviews Zane asked the participating young women about their experiences as students, teen mothers or pregnant teens, and dropouts. The participating teen girls in the focus group were black, Latina, and white, and they were from Philadelphia, Pennsylvania.

In their study Fine and Zane (1991) found that low-income teens live nested inside relationships of care, responsibility, and in many occasions violence. The Latina, black, and white females whom were interviewed reported being involved in caring for themselves and their kin. These teens also lived in a world that was not organized around their needs. Additionally, Fine and Zane (1991) found with quantitative evidence that teenagers who subscribe to traditional gender roles are more likely to drop out of high school due to pregnancy, or child care needs, and that their language development skills (e.g., vocabulary, reading, and writing), deteriorate considerably when they abandon school prematurely.

Fine and Zane (1991) explored the school experiences of their participants and found that the young women internalized grade retention (being held back a grade) as an institutional message of their personal inadequacy. Some of the respondents coupled their unhappiness with school to deficient relationships with teachers and counselors. Additionally, Fine and Zane (1991) found quantitative evidence that substantiates that those teenage girls who as sophomores anticipated being married and having a child by 19 years of age and who subscribed to traditional gender roles were more likely to not graduate from high school than those teenage girls who said that they did not expect to marry, and have a child by age 19. As a result those girls who dropped out to fulfill gender roles (e.g., child care, pregnancy, and family strain) were more vulnerable to fluctuations in socioeconomic level.

Fine and Zane's study (1991) shed light on the fact that because often times females that endorse traditional gender roles enact responsibilities that are incompatible with school are forced to sacrifice their own education and aspirations in the service of others, and in their realities their needs and those of others are interwoven together. These young mothers feel the toll of being pulled in all directions.

Father's age

It is important to note that teen mothers do not always have children with teen male partners. In fact, research has shown that teen mothers tend to have male partners that are a few years older than they are (Hardy, Duggan, Masnyk, & Pearson, 1989; Marsiglio, 1995; Agurcia, Rickert, Berenson, Volk, & Wiemann,

2001). Even though some of these fathers may be in their 20's, developmentally they are often more like adolescents than adults (Nakashima & Camp, 1984; Tuttle, 1988). They may also on some occasions run into problems similar to those of their younger male counterparts. These fathers are often disadvantaged economically and have completed fewer years of schooling (Marsiglio, 1995), and in that respect appear to be more similar to teen fathers than adult fathers.

Furthermore, Furstenberg and Talvite (1980) have suggested that when couples start having intercourse, the male partner has a great deal to do with whether or not pregnancy happens, because they can refuse to use condoms or prohibit the use of other contraceptives. In addition, according to research, economically disadvantaged young men are more likely than middle-class adolescent males to have children in their teenage years and to see fatherhood as a way to legitimize their social role in the face of adversity and diminished opportunities.

Agurcia, Rickert, Berenson, Volk, & Wiemann (2001) directed a study using a sample of adolescent mothers who delivered at The University of Texas Medical Branch at Galveston. In order to be eligible to participate in the study the teen mothers had to meet five criteria: 1) identify as white, African American, or Mexican American; 2) retain custody of their baby; 3) be free of any major psychiatric disorders; 4) have a fifth grade level ability to read and write in English or Spanish; and 5) give birth to a healthy baby weighing more than 1500 grams. The sample consisted of 143 white mothers, 190 Mexican American

mothers, and 162 African American mothers. The teen mothers were interviewed after delivery and were mailed a survey to complete at 12 months postpartum.

In their study Agurcia et al., (2001) found that similar age fathers averaged 18.8 years and were on average 1.4 years of age older than the teen mothers. Their age ranged from 15 years of age to 21 years of age. The older adult fathers averaged 25.5 years of age and were on average 4 years older than teen mothers. Their age ranged from 20 years of age to 50 years of age.

Agurcia et al., (2001), found that adolescent females who became pregnant by older men were not more likely to be married or living with the baby's father than teen mothers who become pregnant by similar age men and were more likely to be living on their own. The teen mothers that lived with older fathers were found to be less likely to be enrolled in school or to be employed. These mothers that lived with older fathers also reported having enough money to live on and to have enough transportation to go places. However, teen mothers that had babies with older men and were not living with them reported not having enough money to live on and not having family support.

The study by Argucia et al., (2001) was largely a descriptive study and other studies need to be conducted to examine relationship dynamics and life circumstances between teen mothers and their baby's fathers. Additionally all the information reported was obtained from the teen mothers. If the babies' fathers were questioned different patterns of results may have been revealed.

Social support

Postpartum teen mothers need emotional, material, informational, and network support. When teen mothers feel emotionally supported they are more likely to accept other forms of support (Logsdon & Koniak-Griffin, 2005). The involvement and support provided by the male romantic partner is associated with greater life satisfaction, lower psychological distress, positive maternal-infant interaction, improved parenting, and economic benefits (Logsdon & Koniak-Griffin, 2005).

Roye and Balk's (1996) review of the American literature on partner support points out that this type of support is related to higher self-esteem scores when the teen mother feels that her support needs are being satisfied. In their literature review Roye and Balk (1996) also found that although partner support is thought to improve the economic situation of adolescent mothers, it has also been associated with non-completion of schooling for teen mothers (Warrick, Christianson, Walruff, & Cook, 1993).

Warrick et al., (1993) conducted a multisite longitudinal evaluation of the Teen Pregnancy and Parenting Project (TAPP) demonstration programs. The programs were funded privately by the Flinn Foundation and provided comprehensive services to pregnant and parenting teen mothers. However, the main objective of the programs was to keep pregnant and parenting students in school. The sample consisted of 789 students who were enrolled in the evaluation. The sample consisted of Hispanics (40%), non-Hispanic whites (34%), non-

Hispanic blacks (18%), and Native Americans (8%). The Hispanic sample was highly acculturated and the majority were third-generation Mexican Americans.

During the evaluation of the Teen Pregnancy and Parenting Project (TAPP) demonstration programs Warrick et al. (1993) found that living with a husband or boyfriend was significantly correlated with dropping out of school. In the sample 19% were living with a partner. The project coordinators believed that it was possible that the male partners were jealous of the young women being at school, because they could come in contact with or meet other young men. The project coordinators speculated that for that reason male partners often encouraged the young women to be truant. Warrick et al. (1993) also found that one of the TAPP programs that involved the male partner, as well as the teen mother was more successful in decreasing the dropout rate.

There are several issues with the Warrick's et al. (1993) multisite longitudinal evaluation design that could influence the interpretation of the results, and which in turn can create limitations for the study. One of these issues is the fact that participants were not selected randomly. This lack of randomization could have resulted in selection bias favoring more educationally motivated young participants. However, the evaluation study has some strengths: a) the study was a longitudinal survey, and b) a large sub-sample of young Mexican Americans which allowed for outcomes in this group to be compared with other non- Hispanic groups.

According to Gee and Rhodes (2003) social support, especially from male partners seems to play a central role in mitigating the postpartum adjustment

difficulties for teen mothers. Some young mothers benefit greatly from the support that is provided by the fathers of their babies, and the father's support has been rated as being as important as support provided by the teens' mothers. The support from fathers has been associated with higher levels of self-esteem for the teen mothers, and contributes to less angry and punitive parenting on the part of adolescent mothers. Gee and Rhodes also suggest that in some cases, male partners provide support and comfort, but in other cases they contribute distress and heightened adjustment difficulties when the relationship is problematic.

Mesosystem

The mesosystem is formed by different settings. The mesosystem is a set of interrelations between two or more settings in which an individual becomes an active participant. Role transactions and molar activities take place across setting boundaries (Bronfenbrenner, 1979).

Mother's residency status

According to Furstenberg, Brooks-Gunn, and Morgan (1987) even if teen mothers drop out of school, that fact does not foreclose their chances of obtaining further schooling. Many teen mothers are able to resume their education after their youngest child enters school (Furstenberg, Brooks-Gunn, & Morgan, 1987). They found teen mothers who lived with their parents were more likely to return to school and graduate from high school than those who lived on their own or with a partner. It appears that when grandmothers provided childcare on a regular basis, teen mothers were able to pursue their education (Unger & Cooley, 1992).

The proportion of black teen mothers graduating high school is much greater than whites. Hispanic teen mothers have presented with the lowest rate of high school graduation (Klepinger, Lundberg, & Plotnick, 1995). Black teen mothers are not as educationally handicapped as whites and Hispanics. Black teen mothers are more likely to live with their parents, depend on extended family for support after the child's birth, as well as, to have higher educational aspirations than white and Hispanic teen mothers. Motherhood for black teen mothers is not as compelling a reason to leave home as it is for whites (Rudd, McKenry, & Nah, 1990).

Unger and Cooley (1992) conducted a study to examine patterns of contact between teen mothers, their partners, and the child's grandmother in black and white families. The researchers used data from the Mother-Child (1984) merged data set of the National Longitudinal Survey of Youth (NLSY). Unger and Cooley (1992) used a subset of teen females who had been parents, and children born to these young women. The participants has been interviewed in their homes in 1979 and then yearly until 1984. The sample consisted of 338 teen mothers and their children. The teen mothers mean age was 17.6 years of age and ranged from 14 to 19 years of age. The children's age ranged from six to 7.9 years of age. The participants were 51% black and 49% white. The teen mothers had completed an average of 10.9 grades of education, ranging from 6 to 17 years of education by 1984.

In their study Unger and Cooley (1992) found that black teens were more likely to live with their parents, were single parents, and married later than white

teen mothers. Furthermore, black teen mothers completed more years of school than did white teen mothers. Unger and Cooley (1992) also found that in both black and white families, when teens had grandmothers providing childcare care on regular bases during their child's first two years, they were able to complete more years of education.

Unger and Cooley (1992) pointed out that male partner contact was generally positive for the child's development, nevertheless this was not always true for the teen mother. The researchers found that early marriages for whites were associated with less maternal education. The researchers also found that for black teen mothers living with a partner, 33% abandoned school before the 10th grade in comparison to 15% who were not living with a partner.

The study conducted by Unger and Cooley has some important features. One of these features is that it was longitudinal. Additionally, the sample consisted of black and white teen parents from a nationally representative sample. However, because the participants were from a disadvantaged background and were black and white the results may not be generalizable to other ethnic groups or to teen parents living in families with substantial financial resources.

Employment

The employment opportunities available to teen mothers affect the mothers' ability to support themselves and their children. These employment opportunities are essentially determined by the qualifications teen mothers bring to the market (Klepinger, Lundberg, & Plotnick, 1995). In addition, it has been found that education is highly related to employment. It has also been found that

teenage childbearing appears to increase the rate of completion of the General Educational Development (GED) test (Hotz, Williams-McElroy, & Sanders, 2005). However, a GED may carry a lower return in future earnings than a high school diploma (Cameron & Heckman, 1993). According to Cameron and Heckman (1993), individuals who hold a GED have the same labor market outcomes as high school dropouts. What is more, GED certified individuals have lower employment rates, less work experience, and less post-secondary training than high school graduates (Cameron & Heckman, 1993). Those GED graduates who attend college take a more vocational-oriented set of courses than high school graduates. Nevertheless, even with a high school diploma there are not high-paying jobs for women without advanced training (Polit & Kahn, 1984). In the present day, teen mothers who are not able to obtain higher education are at a disadvantage because of the falling demand for low-skill labor (Hofferth, Reid, & Mott, 2001). Therefore, teen mothers without a college education find themselves in unskilled or semiskilled jobs in the service sector of the economy (Furstenberg et al., 1987). Additionally, because of their educational deficiency, teen mothers are forced to accept jobs that offer less on-the-job training, and as a result prospects for higher paying jobs may be reduced (Trussell, 1980).

Exosystem

The exosystem operates in a causal sequence that requires at least two steps. In the first step, events occurring in external settings are connected to the individual's microsystem. In the second step, the microsystem processes in the individual's life create developmental changes for the individual.

Social policy

As mentioned earlier, teenagers living with their parents have more support with child care, which provides more time for the teen mother to pursue education or job related training (Hutchens, Jakubson, & Schwartz, 1989). Hutchens, Jakubson, and Schwartz (1989) conducted a study to examine the effects of AFDC benefits upon a teen mother's tendency to live in a subfamily. A subfamily is a family that does not maintain their own household, but lives in somebody else's home that is related or not related to them (U.S. Census Bureau, Population Division, Fertility & Family Statistics Branch, 2004). The sample was drawn from the March 1984 Current Population Survey (CPS). This survey contains data on AFDC income in calendar year 1983. The sample consisted of 1,599 single mothers. In the sample, 608 were householders who did not receive welfare, 351 were heads of subfamilies not receiving welfare benefits, 464 were householders who were receiving welfare benefits, and 176 were subfamily heads who were also welfare recipients. After conducting a binary logit model and a universal logit model Hutchens et al., found that in some states, if a single mother decided to head a subfamily in a larger family unit, she would receive significantly lower AFDC benefits. This led the researchers to state that at least in some states, how AFDC benefits were structured had the potential to discourage single mothers to live as a head of a subfamily. In some states, single mothers would have higher AFDC benefits if they lived as heads of their own household. However, receiving higher benefits only had a small effect on living arrangements for single mothers.

The researchers also found that a single mother's age was associated with whether she was the head of her household or lived in a subfamily. The higher a single mother's age was the higher the relative probability of her being a householder. Also, the number of children that a single mother had, and if she lived in the south increased the relative probability of a single mother being the head of the household (Hutchens et al., 1989). Hutchens et al., also found that non-whites had a lower probability of being the head of their own household.

In their study Hutchens et al. (1988) have found evidence that appears to indicate that the structure of AFDC benefits at least in some states have the potential to discourage some mothers from living in subfamilies, but because the behavioral effect of differential treatment for heads of household and subfamilies was found to be small, it is unlikely that this was a major cause for how mothers decided to live.

According to Acs et al., (1998) Medicaid should not discourage a parent from working at least part time even though Medicaid does not appear to affect hours worked for those that are employed. Under Section 1931 families can continue to be eligible for Medicaid even after entering low-wage jobs (Greenberg, 1998). Most people that need Medicaid work in low paying jobs.

Hill and Macan (1996) argue that the fact that low paying jobs do not offer health insurance, coupled with the mental and physical health problems related with poverty, diminish the likelihood that impoverished heads of household will work. Furthermore, that these circumstances would be exacerbated when there is

one or more disabled children, or children with special needs which increases the need for health insurance.

In a study Kalil and Danziger (2000) examined the socio-economic and psychological well-being of 88 teen mothers in one Michigan county. Caseworkers in a local welfare office helped the researchers by providing the names of teen mothers that resided with a parent or guardian who were receiving either TANF or Medicaid. Half of the teen mothers in the sample were receiving TANF in 1997. The other half of teen mothers in the sample was receiving Medicaid in 1997. Kalil and Danziger (2000) solicited participation from the teen mothers and their mothers. The information was collected via in-home face-to-face interviews that lasted an average of 90 minutes. In the sample, 48% of the participants were African American, 40% were white, and 12% reported being Latina, Native-American or mixed ethnicity. Kalil and Danziger (2000) found that those teen mothers who reported more child care problems were less likely to be enrolled in or graduate from high school, and those teen mothers that reported to have higher educational expectations were more likely to be in school or graduated. White mothers and those mothers who were living with grandmothers were less likely to be enrolled in school, or to have graduated from high school than African American teen mothers, and non-coresiding teen mothers. Kalil and Danziger (2000) also found that almost a third of the teen mothers in the sample were employed for pay. A very important finding was that receiving cash assistance benefits was not associated with being enrolled in school, living with parents or a guardian. Kalil and Danzinger (2000) also argued that it was unclear

if the school attendance requirement by TANF would increase overall educational achievement for teen mothers. The researchers further argued that TANF may boost GED enrollment and school attendance, but not significantly increase graduation rates.

The state of Arizona implemented programs such as the living arrangements for minor parents and sanctions under a waiver before PRWORA mandated them in other states (Zeigler, 2004). In Arizona, the waiver program was called EMPOWER (Employing and Moving People Off Welfare and Encouraging Responsibility) (The National Crittenton Foundation, 2008). In Arizona, teen mothers receiving welfare benefits must live in an adult-supervised setting. Teen mothers in Arizona are allowed to live with a parent, legal guardian, or adult relative (Wood & Burghardt, 1997). Nevertheless, teen mothers are allowed to live independently if they have no parental or legal guardian available or if the teen mother has lived independently for at least one year prior to applying for welfare benefits (Wood & Burghardt, 1997). However, as soon as TANF was mandated nationally, Arizona passed a waiver for the TANF living arrangement requirement for teen mothers. Arizona immediately looked for ways to avoid altogether the responsibility to provide, or to assist in locating homes for teen mothers. Therefore, teen mothers who outgrow foster care and are receiving TANF in Arizona only have to comply with the school/training requirement (The National Crittenton Foundation, 2010). Even though Arizona's welfare agencies do not fund teenage parent group homes, the state legislature may assign TANF funds for Second Chance Homes for teen mothers who are homeless or in foster

care (The National Crittenton Foundation, 2010). According to the U.S. Department of Housing and Urban Development (2001) Second Chance Homes are “adult-supervised, supportive group homes or apartment clusters for teen mothers, and their children who cannot live at home because of abuse, neglect or other extenuating circumstances” (para. 3). In Arizona, teen mothers who lack a high school diploma, and are receiving TANF benefits are encouraged to work toward a diploma or a GED. In spite of this, Arizona contracts with GED programs for teen mothers on a limited basis. The GED programs also incorporate life skills and parenting education classes (Wood & Burghardt, 1997). However, similar to other states in the U.S., Arizona has a work-first approach which enjoys political support. According to Jacobs and Winslow (2003) the emphasis on work-first welfare reform may have affected and limited the chances of welfare recipients to pursue higher education.

Jacobs and Winslow (2003) conducted a study to assess the impact of welfare reform on access to higher education for poor single mothers and welfare recipients. Jacobs and Winslow examined short-term and noncredit versus degree granting programs. The researchers also examined the overall extent of participation in post-secondary education. Jacobs and Winslow used data from the Current Population Surveys (CPS), the National Household Education Survey (NHES), and the National Post-Secondary Student Aid Survey (NPSAS). The researchers also used data from case studies of welfare reform and community colleges in six states. The CPS is a large data source that tracks enrollment trends. The CPS data included 9,000 respondents in 1995 and 8,000 in 2000. The CPS

allows researchers to examine the enrollment patterns of young single mothers and welfare recipients. The NHES were intended to track enrollment patterns of adult students and traditional aged college students. The NHES was administered before welfare reform to slightly less than 11,000 respondents in 1995 and to slightly less than 4,000 respondents after welfare reform in 1999. Jacobs and Winslow (2003) compared the enrollment rates of welfare recipients and nonrecipients for 1995 and 2000 using the CPS data, and then the researchers conducted a multivariate regression analysis to assess the influence of welfare receipt on other factors on enrollment. Jacobs and Winslow also replicated the CPS results with the NHES data.

The researchers found that in some states education is not approved as a work activity (e.g., Connecticut, Oregon, and Wisconsin), in some states education is permitted when combined with some work (e.g., Arizona, California, and New Mexico), and in some states education is approved as a work activity (e.g., Alaska, Georgia, and Florida). Jacobs and Winslow (2003) argue that the data from all their sources point to a decline in the number of welfare participants attending establishments of higher education in the U.S. in the period after the passing of TANF. In the NHES data the researchers found a decline in the enrollment of all ages of TANF recipients between 1995 and 1999, and these findings were statistically significant. In the CPS data it was found that there was a comparative decline for single mothers versus others.

Furthermore, it was found in the NPSAS data that the enrollment of TANF recipients changed noticeably from degree-based programs to short-term

certificate programs. However, Jacobs and Winslow contended that the traditional over-representation of welfare recipients in Associate degrees is eroding, and their underrepresentation in four-year degree programs is growing. Jacobs and Winslow (2003) stated that the CPS data indicates that state policies matter when it comes to differences in enrollment in institutions of higher learning. The researchers found that states with the most restrictive policies on education for TANF recipients had lower enrollment rates than states with more liberal options.

Home Visitation

The state of Arizona has also implemented home visitation programs with TANF, state, and foundation money for at risk families. One of the home visitation programs in Arizona is Healthy Families Arizona (HFAz). This home visitation program falls under the Healthy Families America (HFA) umbrella and it started in 1991 as a demonstration project. HFAz is a voluntary program open to all families for a lifetime maximum of five years. The goals of HFAz include 1) the prevention of child neglect and abuse, 2) the improvement of children's development and health, and 3) the promotion of positive parent child interactions (Krysiak & LeCroy, 2007). The HFAz program is administered by the Arizona Department of Economic Security (ADES) and the funds for the program are appropriated on an annual basis. In addition, the program is guided by a community-based, statewide steering committee with six standing committees. These six committees focus on training, credentialing, community partnership, advocacy, policies and procedures (Krysiak & LeCroy, 2007).

The state legislature has made changes in the process and content of HFAz over the years since its conception. One of the changes was the inclusion of the expectation that the program assist families to diminish their dependency on public assistance by reducing their illiteracy and encouraging them to seek employment and self-sufficiency. The families participating in HFAz are also expected to receive required community services and if needed education on successful marriage (Krysik & LeCroy, 2007). HFAz is a relationship-based program; therefore, the development of trust and of a constructive relationship between the home visitor and the client is very important to the process. The foci of the home visits address issues such as personal goals, emotional support, and referral services amongst others (Krysik & LeCroy, 2007).

Macrosystem

The macrosystem is composed of patterns that can potentially exist in the micro-, meso-, and exo- systems at the level of the subculture, and culture as a whole, alongside any belief system or ideology. The macrosystem is apparent in the connection of form and content revealed by the analysis of a given culture or subculture with respect to the three prior lower-order systems of the ecological environment (Bronfenbrenner, 1979).

Culture and education

Culture can be a potential channel of influence for an individual's educability, and how much education an individual attains. Culture refers to customary beliefs and ethnic, religious, and social group values that are transmitted from generation to generation (Guiso, Sapienza, & Zingales, 2006).

Educability refers to the basic orientation, motivation, and skills that are required to succeed in school (Chan & Rueda, 1979). For example, for Mexican-Americans education is not as important as the status an individual has within the family and friendship networks for which differences in education are less relevant. Furthermore, the ties in Mexican-American extended family and pseudo-kinship are very strong (Mirowsky & Ross, 1980). However, Blair, Legazpi-Blair, and Madamba (1999), argue that socioeconomic status and ethnicity influence students' educational performance.

Blair et al., (1999) conducted a study to examine the potential effects of ethnic-group membership and social class on educational performance. Blair et al., (1999) proposed that educational achievement variations across racial and ethnic groups can be pinned down to the familial context. The researchers argue that parenting styles and parents' valuation of education exist across ethnic cultures, and they may influence educational achievement.

Blair et al., (1999) used data from the first two waves of the National Educational Longitudinal Study (NELS) (1988 and 1990). The NELS includes data about the student, and this data was taken from students, their parents, school administrator, and teachers. Students were randomly drawn from 1,057 schools nationwide. The final sample consisted of 14,063 students.

In their study Blair et al., (1999) found that cultural characteristics were only scantily associated with students' educational achievement. However, the effect of the cultural characteristics varied somewhat from one group to the other. Language preference (other than English) in the home was not significantly

associated with educational achievement. The presence of extended kin in the home was statistically associated to educational performance. Higher levels of school performance were found among African American students who had extended kin in the home, but the opposite was found for white students. Lower levels of school performance were found among white students who had extended kin in the home. Blair et al., (1999) argue that the impact of ethnicity on educational achievement might be difficult to detect within a survey research format, and it would be a mistake to come to the conclusion that ethnicity is insignificant as a predictor of student's educational performance.

Blair et al., (1999) found the strongest association between social class characteristics such as income, parental education, and availability of educational resources within the home, and educational achievement across all ethnic and racial groups (African American, white, Asian, Hispanic). Family structural traits, such as single parent status, and number of siblings were also found to be significantly associated with students' educational performance.

Hill and Jepsen (2007) carried out a study to identify the role that factors such as race, ethnicity, immigration status, families, neighborhoods, and behavior play in accomplishing positive school and work outcomes for individuals who seem destined for a poor start (e.g., teen pregnancy, school dropout). Hill and Jepsen (2007) were also interested in highlighting any differences in these predictors relative to individuals not likely to have a teen pregnancy or be school drop outs. Hill and Jepsen (2007) used data for the study from the National Educational Longitudinal Survey (NELS). The NELS is a nationally

representative study of eighth-grade students' experiences, aspirations, parental background and school resources. The surveys were conducted in 1988, 1990, 1992, 1994, and 2000. The sample consisted of 6,280 females and 5,967 males.

Hill and Jepsen (2007) found that race, ethnicity, and generation have a statistically significant effect on poor starts with no other control variables. The researchers found that being Asian is associated with a lower likelihood of being a teen mother, and being a female third generation Asian was associated with lower probabilities of dropping out of high school. On the other hand, being Mexican American or black is associated with higher chances of being a teen mother or a dropout (Hill & Jepsen, 2007). Conversely, being a second generation non-Mexican Hispanic female is associated with a lower likelihood of dropping out of school or being a teen mother. Hill and Jepsen (2007) also found that students who used drugs or engaged in sexual intercourse by age 19 were at higher risk for a teen pregnancy or dropping out of school. Females who were likely poor starters who attended schools with school-to-work programs were more likely to work full time. Females at risk to be teen mothers or dropouts whose mothers had a college degree had less likelihood than females whose mothers dropped out of school to work full time. Additionally, females likely to be poor starters who were part of a gang in 1992 were more likely to work full time than those who did not belong to a gang (Hill & Jepsen, 2007).

Hill and Jepsen (2007) in their study also found that race was associated with discrete rates of post-secondary attendance. It was found that most ethnic groups had a higher likelihood of post-secondary education than third generation

whites. In addition maternal education and family income were solid positive predictors of post-secondary education for poor starters. But having a large number of siblings had a negative influence on post-secondary education for poor starters. Furthermore, females likely to be poor starters that worked while in high school had increased possibilities of post-secondary attendance.

Summary

Teen motherhood has been found to create many obstacles for the human capital accumulation of young mothers. The time of the first birth has consequences for the amount of education a teen mother accrues. Older teen mothers have been found to have higher levels of education than younger teen mothers. Also, mothers that have higher educational goals and aspirations are more likely to graduate from high school. Furthermore, teen mothers are more likely to obtain a GED verses a high school diploma, and not enroll in a four-year college education program than their nonparenting female counterparts. Research has established that because education is associated with employment, in many occasions teen mothers are forced to take low prestige dead-end jobs that often do not offer further on the job training. In spite of efforts made by policy makers when they enacted the new TANF teen requirements to persuade teen mothers to stay in school, it appears that not much has changed as far as teen mothers getting more education. Most TANF programs for teens end at the high school level and most teen mothers are encouraged to get a GED. After that they are required to work at least 20 hours a week.

Research on father involvement has established the teen mothers do not always have babies with men their own age, but often the baby's father is older. It has also been found that although the teen mothers' child's father may be older, they may still developmentally be similar to their younger male counterparts. Additionally, researchers have found evidence to support that when a teen mother has a positive relationship with the baby's father, she is more likely to experience greater life satisfaction, economic benefits, and maintain a positive mother-infant relationship and less punitive parenting. Conversely, when a teen mother has a low quality relationship with the baby's father this interaction can bring additional stress and anxiety to the teen mother's life. However, if the father is absent the teen mother has been found to experience greater depressive symptoms and anxiety than when the father is present. Moreover, teen mothers that reside with an older male partner have been found to be less likely to be enrolled in school or to be employed. On the other hand, teen mothers that live with their family are more likely to be in school or employed.

Research on teen mothers' mental health has found that teenagers with conduct disorder may have a desire to be pregnant, and can still lead chaotic lives and drop out of school. Researchers also found evidence that when individuals use drugs or alcohol, it contributes to unfavorable outcomes, because substance use compromises academic performance, interferes with goals and can maintain defeating behaviors.

Teen mothers that subscribe to traditional gender roles of caretaker have been found to be more likely to drop out of high school due to pregnancy. Also,

the number of children a teen mother has tends to affect later educational attainment and labor market participation. The more children a teen mother has the less likely she will go on with her education or will work outside the home. Mothers with children younger than three years of age have been found to be employed at lower rates than mothers of older children.

Researchers have also found evidence to support that cultural characteristics are associated with a student's educational achievement. Race was also found to be associated with different rates of post-secondary education for all ethnic groups but not for third generation whites. Other variables that researchers have found to be positively associated with post-secondary attendance are working while in high school and having a mother that is a college graduate.

Limitations

Researchers try to use the methods they consider are best for their analysis so they can obtain the most accurate results. However, researchers cannot always control all the details of the data they have available to them. Sometimes researchers have financial constraints that do not allow them to sample as many participants as they would want. Often researchers have to use already existing data sets. These circumstances can frequently lead to limitations in a study. Research on teen mothers' human capital accumulation is not immune to having some of these limitations. There are other factors that prevent some studies from delivering results that can be generalized. Some researchers choose to study specific races, such as studying whites and blacks or blacks only. By doing this the researchers leave all other ethnic groups and races out (e.g., Rudd, McKenry,

& Nah, 1990; Unger & Cooley, 1992; Scott-Jones & Turner, 1990) . Some researchers use data specific to an area in the United States (e.g., Kalil & Danzinger, 2000).

According to Boden, Fergusson, and Horwood (2008), existing studies of teen motherhood and later outcomes suffer from three limitations: 1) some researchers use specialized populations or selected samples; 2) the lack of control for factors that could be correlated with teen motherhood and also play a part in later adverse educational and economic outcomes, such as measures of social, family, and individual factors; 3) the use of cross-sectional designs and data for which measures were obtained retrospectively. These measures include early parenthood, contextual factors, and backgrounds.

In addition, Boden et al., (2008), argue that studies based on comparison of teen mothers and older mothers on all outcomes, require a comparison of women of different ages, and that the timing of the exposure to motherhood could potentially cause difficulties in determining the extent of the discrete effects of teen motherhood.

Specific Research Question and Hypotheses

The present study seeks to find evidence that answers this study' research question. The general research question is: How does the involvement of the baby's biological father affect the human capital accumulation of teen mothers? Furthermore, after reviewing literature on the human capital accumulation of teen mothers, and literature on father involvement, particular hypotheses have been formulated using social exchange theory and ecological theory as a framework.

Ecological theory is concerned with the adaptation and mutual accommodation between individuals and their environment. Therefore, ecological theory will help assess the nature of the ecological level of fit between a teen mother's needs and capacities on one hand, and on the other, the environmental resources and expectations available to the teen mother. By analyzing the teen mother's environment, new sources of strength that can aid a teen mother in her quest for human capital accumulation can potentially be recognized. However, ecological theory is conceived topologically and looks at the relationships between linked systems in an individual's environment, but does not provide guidance as to what level in the individual's environment are more primary or essential.

In contrast, social exchange theory is not based on systems but is more concerned in addressing all behaviors and social structures based on a hierarchy of value to the individual. According to social exchange theory, individuals are motivated and act as to maximize those outcomes they perceive to be the most profitable to them, even if in the process they have to accept some cost. Additionally social exchange theory poses that if we understand individuals we will understand macrosocial phenomena.

Social exchange theory and ecological theory share two concepts. One of these concepts is the idea of reciprocity. For ecological theory an individual's relationship with her/his environment is two-directional and characterized by reciprocity. For social exchange theorists, society would not work if there was no reciprocity between individuals and social structures. The other concept is the

dyad. For social exchange theory the focus of inquiry is on the face-to-face interactions and relationships of individuals, and for ecological theory the dyad or two individual units is the basic unit of analysis. In conclusion, social exchange theory and ecological theory come from different perspectives but they have some aspects in common and complement each other by providing different perspectives to the dyad analysis and the concept of reciprocity.

At the time of the baby's birth the teen mother/ father dyad is faced with three possible options. 1) father not involved with the baby at all, 2) co-residence with the father, 3) involved but not co-residents. There is preliminary research (e.g., Unger & Cooley, 1992) that suggest that teen mothers that have more support outside of the babies' fathers at the microsystem level have an easier time adapting to motherhood and allow for longer term pay offs. Some of the teen mother's internal factors that can influence her transition and adaptation to motherhood and that can also influence if the mother will continue her education are her mental health, social networks, and her family. Teen mothers that receive financial help and child care as well as emotional support from their parents will be more likely to continue their education than those who do not. A teen mother who feels supported, and who does not have to worry about money issues or child care will have a greater chance adapting to her new role of mother. This teen mother will also feel more encouraged and value more the other areas of her life, including education.

However, teen mothers who are not involved with the fathers and who do not have support from their families have been found to experience more

depression and to not be enrolled in school. On the other hand, if a teen mother resides with the baby's father then the role of caretaker and romantic partner may become more important, and she might not pursue additional education. Furthermore, in a previously mentioned qualitative study (e.g., Fine and Zane, 1991) it was found that teenagers who subscribe to traditional views of gender roles are more likely to drop out of school and not graduate than those who do not. Furthermore, when teen mothers enact the caretaker role they are often forced to sacrifice their education and aspirations because caretaker responsibilities are incompatible with the student role.

If the teen mother resides with her family and is involved, but not residing with the baby's father, the role of caretaker will not be as important for the teen mother, and the role of student will be more valuable, therefore, she will be more likely to be in school. Teen mothers who live with their parents may be more likely to have the opportunity to still be students and daughters while being mothers because they have financial and childcare assistance. They may also experience less depression and anxiety and more satisfaction with their lives because they are still involved with the babies' fathers.

Research suggests (e.g., Fine & Zane, 1991; Unger & Cooley, 1992; Hill & Jepsen, 2007) that some of the teen mother's external factors that influence her transition to motherhood and whether she will pursue additional education are her ethnic background and whether or not she receives TANF benefits. It can be said that teen mothers who receive TANF benefits will obtain more education than teen mothers who do not receive TANF benefits because teen mothers who

receive welfare assistance are required to be in school to continue receiving benefits. Teen mothers who receive TANF benefits also can feel more supported as they transition to the new stage of motherhood because they do not have to struggle as much financially as others who do not, and also can take advantage of other social services such as parenting classes and food stamps. Furthermore, a teen mother's cultural background can influence whether or not she will obtain more education or not.

After reviewing the literature on teen mothers and human capital accumulation it was apparent that studies only examine one level at a time. There were no studies found that combined the ecological levels (e.g. microsystem, mesosystem, exosystem, and macrosystem) to study this phenomena. Additionally, during the review of the literature it was found that culture has a lot to do with whether an individual pursues an education or not, however, there were no studies found that investigated the relationship between father involvement and culture with education. Therefore, by adding father involvement to the equation of teen motherhood and human capital accumulation this study seeks a more nuanced understanding of this phenomenon.

To conclude, it is important to mention that the data available will dictate the variables that are accessible for analysis, as well as dictate the hypotheses that will be formulated. Therefore, the specific hypotheses will be established in the next chapter.

Chapter 3

METHODS

In this chapter the methods that will be used in this study will be discussed. The data set is a subset of the Healthy Families Arizona longitudinal evaluation. The subjects for this study will be those participants between the ages of 13 and 21 years of age. The requirements to be involved in the study that the data set is taken from will be described. The variables to be used are: mother's substance use, TANF participation, mother's residency status, mother's disability, number of children, subsequent pregnancies, child's age, child's disability, child care problems, mother's age, father's age, race, father involvement, education, and labor market participation. In addition, the research question, the hypotheses for the study, and the statistical procedures that will be used will be presented.

Healthy Families Arizona

The Healthy Families Arizona longitudinal evaluation data are available as a result of the work performed by LeCroy and Milligan Associates, Inc. Healthy Families Arizona is a voluntary, home visitation program, aimed at the prevention of child abuse and neglect. This secondary prevention program is targeted to the parents of newborns with risk factors that make them vulnerable to child abuse and neglect, and at risk of parent/child relationship and child development problems. The 10 risk factors that qualify parents for the program include parental history of abuse and neglect, substance abuse, mental health problems, poor coping skills, a lack of social support, unrealistic developmental expectations of infants and toddlers, difficulty with bonding and attachment,

attitudes favorable toward harsh discipline, anger management issues, and lack of resources to meet basic needs.

Modeled on the Healthy Families America program, Healthy Families began in Arizona in 1991. Administered by the Arizona Department of Economic Security Division of Children, Youth, and Families, Healthy Families Arizona realized considerable growth until 2008 when the state faced a budget crisis. The longitudinal evaluation of Healthy Families Arizona was designed and conducted by LeCroy and Milligan Associates, Inc. to answer questions on the efficacy of the program.

The longitudinal evaluation was a randomized controlled trial (RCT) and included a variety of measures to examine factors such as mental health, domestic violence, discipline, parent child attachment, child behavior, quality of the home environment, cognitive development, maternal well being, and human capital accumulation. The purpose of these measures was to assess the full range of risk and protective factors related to child abuse and neglect, and to examine potential program outcomes.

The evaluation team established a set of criteria to target evaluation site selection. In 2004 the Healthy Families Arizona Quality Assurance team provided data on the 24 established Healthy Families Arizona sites. Based on stability of staff and number of participant openings it was decided that the best location for the evaluation in a metro area would be Pima County. Oversight for all nine Pima County sites occurred through Child and Family Resources, Inc.

Recruitment

IRB approval was completed in December 2006 and five exclusion criteria related to recruitment were specified in collaboration with the administrative staff of Healthy Families Arizona in Pima County and in consultation with the Family Assessment Workers in Pima County. The five exclusion criteria included:

1. Families referred to Healthy Families Arizona by CPS.
2. Families who self-referred.
3. Families for which the hospital social worker made a referral to Healthy Families Arizona.
4. Families that were particularly crisis ridden as determined by the FAW staff in consultation with their supervisors.
5. Families who enrolled in Healthy Families Arizona prenatally, except for those who enrolled in the 8th month of pregnancy or later, in which case they were not enrolled in the evaluation until after they had the baby (LeCroy & Milligan Associates, Inc , 2008).

The five exclusion criteria were specified to ensure a sample representative of the most typical Healthy Families Arizona participants in Pima County. In addition, the family had to meet two standard criteria for inclusion in Healthy Families Arizona. First, the score on the Parent Survey had to be equal to or greater than 25 for either parent. This score indicated that the family was at risk for child abuse according to a validation study done by the researchers Murphy, Orkow and Nicola (1985). Second, the child had to be no more than three months of age at the time of enrollment to the evaluation.

In the longitudinal evaluation, 98 families were randomly assigned to the Healthy Families Arizona program, and 97 families were randomly assigned to a control group that did not receive Healthy Families Arizona services. All 195 participating families voluntarily agreed to be involved in the longitudinal evaluation for a period of five years, with the option to withdraw at any time without consequences.

Data Collection

Data were collected from the families upon entry to the evaluation, and data collection was thereafter scheduled to follow the age of the child at six-months, and one, two, three, four, and five years. The participants received incentives in the amount of \$60.00 for year one, and \$30.00 for year two. The study was suspended in year 3 due to the state budget crisis. Also, a \$10.00 incentive was provided to anyone who informed the research assistants of changes in contact information between interviews.

Interview schedules were designed specifically for the longitudinal evaluation and included questions that asked about the mother's living arrangements, employment, education, mothers' perception of the child, relationship with the father, and child's age. There were four interview schedules: baseline, six, twelve, and twenty-four months.

Data collection occurred in the home or at a place convenient to the mother and all interviews averaged 70 minutes at each time period. The interviews were conducted in English or Spanish, according to the mother's preference. In this way, the longitudinal evaluation is representative of the

families that the Healthy Families Arizona program serves. The questions varied somewhat at each data collection period, although some questions remained the same to measure change over time.

The Healthy Families Arizona support specialists did not know if participants were part of the longitudinal study. Although the original plan was for the research assistants to not know the participants' treatment assignments, this was not possible as there were only two research assistants. The research assistants were responsible for recruitment to the study as well as data collection, and this necessitated that the research assistants know the participant's group assignment so they could determine which form to use for data collection. For instance, HFAz Family Support Specialists administered the Ages and Stages Questionnaire (ASQ) to the Healthy Families Arizona participants, whereas the research assistants administered the ASQ to the control group participants. If and when experimental families left the Healthy Families Arizona program, the research assistants administered the ASQ.

To ensure that the participants properly understood each item on the interview schedule, the research assistants read all items out loud and recorded the participants' responses on the interview schedule. Visual charts that depicted the response categories for questions with ordinal level responses (e.g., strongly disagree, disagree, neutral, agree, strongly agree) were used as visual aids to assist the participants in answering the questions. Furthermore, the research assistants had never been involved in delivering or managing the Healthy Families Arizona program or any other type of home visitation program. The research assistants

were young females who each had a young child; one was Hispanic and Spanish speaking, and the other Caucasian.

In order to preserve confidentiality, each family was assigned a unique identification number. Each interview schedule was coded with the family's ID number rather than their name to protect confidentiality. The research assistants and data entry staff entered the data and filed the hard copy records. The hard copy data are stored in a locked file cabinet used exclusively for the Healthy Families Arizona longitudinal evaluation. Only the staff members involved with the longitudinal evaluation have access to the data and the list of names associated with the unique identifiers. An independent ethics review committee, ARGUS IRB, reviewed the protocol for the evaluation. The ASU IRB approved the use of this secondary data for research (see Appendix A) and the Human Research Curriculum Completion Report (see Appendix B).

Sample

For the purpose of this study young teen mothers will be examined. In this study participants between the ages of 13 and 21 years are considered young mothers. There were 84 young mothers ($N = 84$) between the ages of 13 and 21 that participated in the longitudinal evaluation study at baseline. However, at the six month point only 77 young mothers ($N = 77$) completed the interview, and at the 12 month point only 72 young mothers ($N = 72$) completed the interview. As shown in Table 1, the age most reported by the participants was 19 years of age. Also, as shown in Table 1, over half of the participants identified as being Hispanic (65.5%), and less than a fifth of the sample reported being white (19%).

Table 1. Descriptives for Age and Ethnicity *N* = 84

Variable	Frequency	Percent
Mother's age		
15 and less	7	8.2
16	3	3.5
17	13	15.1
18	14	16.3
19	22	25.6
20	15	17.4
21	12	14
Mother's ethnicity		
white	16	19
Hispanic	55	65.5
black	4	4.8
American Indian, Aleut, Eskimo	1	1.2
multi-racial	7	8.3
other	1	1.2
missing	2	

It is important for this study to highlight that in the United States, individuals age 18 and onward have the legal rights of adults such as the right to vote and the right to sign legal documents, however they do not have the right to buy alcohol until age 21. Therefore, individuals do not possess all adult rights until age 21. This is one of the reasons why in this study mothers that are 21 years of age are still considered young mothers. Additionally, this period (18-21 years of age) is part of the human developmental period now identified as emerging adulthood (Arnett, 2004; Arnett, 2007).

Arnett (2004) argued that it is important to recognize that a new life period has developed between the end of adolescence and young adulthood. Arnett

(2004) labeled as “emerging adulthood” this human developmental period that takes place in the late teens through about the mid-twenties (Arnett, 2004; Arnett, 2007). According to Arnett, it is during this period that young individuals gradually lay the foundations for an adult life in the areas of love, work, and world views. Arnett also emphasizes that Erik Erikson’s theory of development through the life course assumed a central challenge or crisis for each developmental stage and that the challenges Erikson described for adolescence was identity versus role confusion. Arnett makes the case, that central to the challenge of identity versus role confusion are the exploration of possibilities in love, work, and ideology. Erik Erikson presented his theory in the 1950’s, but according to Arnett, today the identity exploration that Erikson proposed takes place mostly in emerging adulthood (Arnett, 2004).

Arnett asserts that nowadays in our information-based economy it takes longer to reach adulthood than it did in the past. Arnett further argues that the road to adulthood for young people today is longer than as recently as the 1970’s in the United States, and in other industrialized societies and postindustrial countries of the West and Asia (e.g., Germany, France, Japan, South Korea) (Arnett, 2004; Arnett, 2007) due to the lengthening of higher education, extended job instability during the twenties, and the rise in ages of entering marriage and parenthood. Arnett maintains that emerging adulthood is not universal because it only subsists under specific conditions, which have occurred recently in industrialized and postindustrial countries. However, according to Arnett the period of emerging adulthood is likely to become more omnipresent worldwide in

future decades with the growing globalization of the world economy. He suggests that it is possible that by the end of the 21st century, emerging adulthood could be a normative period of human development globally (Arnett, 2004).

Hypotheses

The goal of the present study was to use the secondary data to answer the research question. The general research question is: How does the involvement of the baby's biological father affect the human capital accumulation of teen mothers? Even though the data were originally used to evaluate the Healthy Families Arizona program, this study will not include any hypotheses regarding the Healthy Families Arizona intervention, however, involvement in the Healthy Families Arizona program will be considered as a covariant. In this study, father involvement will be used as an independent variable in the analysis. According to the literature reviewed in the previous chapter, father involvement affects the direction of a teen mother's human capital accumulation. It is expected to find that co-residency with the father will negatively impact the human capital accumulation of young mothers, however, it is expected that a young mother will gain more human capital when a father is not a co-resident but is involved.

After reviewing the variables available in the data particular hypotheses were formulated:

H1: Young mothers who live with their parents will increase their human capital acquisition, specifically in terms of education and employment.

H2: Young mothers that used illegal drugs or alcohol will not increase their human capital acquisition, specifically in terms of education and employment.

H3: Young mothers who suffer from depression will not increase their human capital acquisition, specifically in terms of education and employment.

H4: Mother's age will be positively related to human capital acquisition, specifically in terms of education and employment.

H5: Young mothers who suffer from a disability will not increase their human capital acquisition, specifically in terms of education and employment.

H6: Young mothers who receive TANF benefits will increase their human capital acquisition, specifically in terms of education and employment.

H7: Young mothers with more than one child will not increase their human capital acquisition, specifically in terms of education and employment.

H8: Young mothers who co-reside with their baby's fathers will not increase their human capital, specifically in terms of education and employment.

H9: Young mothers who are involved with their baby's fathers who are not co-residents will increase their human capital, specifically in terms of education and employment.

Plan for Analyses

The programs to be used for statistical analysis in this study are SPSS 18 and STATA. A descriptive analysis will be performed based on level of measurement to establish the frequency distribution of the nominal and ordinal variables as well as the mode, mean, and standard deviations of the continuous variables. Also, bivariate relationships will be examined: ANOVA will be performed between the continuous dependent variables (DV) and the moderating variable to compare means (e.g., level of education (DV), and father involvement). Chi-square will be performed on all categorical dependent variables and categorical moderating and control variables (e.g., enrolled in school/ not enrolled in school and father involvement). Correlation will be conducted for continuous variables. All continuous variables will be centered. The centering of data helps with interpretation and makes the intercepts a meaningful quantity.

It is expected that over time there will be some increase in human capital. Thus, in order to measure the true impact of father involvement, the statistical models must also estimate this trajectory. To accomplish this, the data will be structured in a long format, with one observation for each time point for each teen mother. In other words, the way the data will be structured will nest observations of time within subjects in order to measure the impact of cumulative father involvement. This method will yield a trajectory variable reflecting change over time. All time-varying measures will be subscripted as indicators measured for each *i*th mother and time point *t*. An indicator for the number of months since the initial interview will identify each time point (M_{it} , coded 0 at entry, then number

of months thereafter). Since the data will be structured in this way, the analyses will be carried out using a “random-effect” regression technique that adds a mother-specific effect to control for unobserved characteristics of the mother that may impact the outcomes. As a result, all of the models will include a random-effect term for each mother noted as the Greek letter delta, δ_i .

The random-effects model (RRM) was chosen to analyze the data because it was developed to handle many of the peculiarities of longitudinal data. One of these peculiarities is missing data. Although some methods exclude variables with missing data from the analysis the random-effects model does not. This ability of the RRM can potentially make the analysis more powerful. Also because RRM treats time as a continuous variable, subjects do not have to be measured at the same time, and covariates can be incorporated in the model and can be either time-varying or invariant (Hedeker & Mermelstein, 1996).

Power

Given that the data will be structured in a long format, the number of observations will be greater than the number of participants (observations = participants * time points). It is possible that many respondents will have little variation in our outcome measures across time, thus, it is expected that there will be a larger design effect. This means that a very conservative estimate of the effective sample size is close to the actual number of participants or $N = 84$.

Based on a sample size of 84 participants, and using power calculation tables from Cohen, there is almost sufficient power (0.75) to detect a moderate effect

size of .30 (Cohen, Cohen, West, & Aiken, 2003). According to Jacob Cohen (1988), power, effect size, significance criterion, and sample size are related and any one of them is a function of the other three. Therefore, increasing one of the four factors will result in an increase of power. Increasing sample size is not an option with the use of secondary data. The remaining options for increasing power are to increase the alpha level, study homogenous groups, add covariates to reduce error variance, and use one-tailed tests instead of two-tailed tests. Based on the relatively small sample size ($N = 84$) and the possibility of a small effect size, the decision was made to keep alpha at .05, but to use one-tailed tests which are consistent with the directional hypotheses. This in effect increases alpha. By studying a subset of the sample in the original study, homogeneity is increased. Also covariates will be added as suggested by the literature (e.g., race, mother's age).

Measures

The independent, moderating, control, and dependent variables for this study have been chosen taking into consideration the relevant literature available about teen motherhood, father involvement, and teen mother's human capital accumulation. The available data, also dictate the variables available to the study. Table 2 compares a list of the variables found in the literature to a list of variables available in the secondary data. The only variables not included in the secondary data that were indicated in the literature indicated in the literature include gender roles, relationship with father, and conduct disorder. The next section in this chapter will describe how each variable will be operationalized for this study.

Table 2. Literature and Study Variables

Variables in Literature	Variables in Secondary Data
Mother's age at first birth	Mother's age
Mother's residency status	Mother's residency status
Gender roles	Not available
Child care	Child care
Mother's mental health	Depression
Conduct disorder	Not available
Substance use	Substance use
Social policy	TANF participation
Mother's financial support	Mother's financial support
Culture	Ethnicity
Father's age	Father's age
Employment participation	Employment participation
Mother's education	Mother's education
Mother's disability	Mother's disability
Child's disability	Child's disability
Number of children	Number of Children
Child's age	Child's age
Subsequent pregnancies	Subsequent pregnancies
Father involvement	Father involvement
Father residency status	Father residency status
Relationship with father	Not available

Independent Variables

Substance use

Substance use was measured by five questions in the secondary data.

These include: Do you drink beer or alcohol? To which the mother could answer yes or no. If the mother answered yes then another question was asked: In the past

two weeks how many times did you drink beer or alcohol? The third question was Do you smoke marijuana? To which a participant could answer yes or no. If the mother answered yes then a fourth question was asked: Do you use any other drugs, for example, cocaine, crack, or meth? To which a mother could answer yes or no. If a mother answered yes then another question was asked: In the past two weeks how many times did you use drugs? The fifth question was do you feel you could benefit from drug/alcohol treatment? To which a mother could answer yes, no, or don't know. These questions were asked during all interviews.

A composite variable was created for this study using the following questions: Do you drink beer or alcohol? Do you smoke marijuana? And, Do you use any other drugs, for example, cocaine, crack, or meth? This variable will produce a count of the "yes" responses to these questions. Also a frequency variable will be created from responses to the questions that asked: In the past two weeks how many times did you drink beer or alcohol? In the past two weeks how many times did you use drugs? The frequency of alcohol and drug consumption will be determined by the participants' reported highest frequency of usage. In addition, to establish perception of need for treatment the question: Do you feel you could benefit from drug/alcohol treatment? will be used as a single item variable (1 = Yes, 0 = No). This question may provide additional information about a mother's substance use. It could be possible that a mother might answer no to the beer, alcohol, and drug questions, because she could feel that it is not socially desirable to consume alcohol or drugs, or she may not have used in the past two weeks, but she might answer yes to the drug/alcohol treatment question.

TANF participation/Social Security income/ Mother's financial support

TANF participation, Social Security income, and mother's financial support were measured by one primary question: In what other ways do you currently support your family financially? To which a participant provided answers to all of the options: partner's employment, paid family/maternity leave, TANF (welfare/cash assistance), child support, Social Security income, unemployment insurance, money from family/friends, and other. This question was asked during the six and 12 month interviews.

A single-item variable at each time point will be created to identify respondents that reported receiving TANF benefits, which will leave the remaining respondents as *Other* (1 = TANF, 0 = Other). This will allow the respondents that are supporting their families financially with TANF funds to be compared to those who reported supporting their families by other means.

A single-item variable at each time point will be created to identify respondents that reported receiving Social Security income, which will leave the remaining respondents as *Other* (1 = Social Security income, 0 = Other). This will allow the respondents that are supporting their families financially with Social Security income to be compared to those who reported supporting their families by other means.

A single-item variable at each time point will be created to identify respondents that reported receiving money from their family/friends, which will leave the remaining respondents as *Other* (1 = Money from family/friends, 0 = Other). This will allow the respondents that are supporting their families

financially with money they receive from their family/friends to be compared to those who reported supporting their families by other means.

Mental health

A mother's mental health was measured by using the Center for Epidemiologic Studies Depression Scale (CES-D). This scale is a commonly used measure of depression. Scores on the CES-D ranged from 0 through 60 for the 22-item version. Higher scores represent greater levels of depression, and scores greater than or equal to 16 suggest clinically significant levels of psychological distress. This 22-item scale included such items as "I did not feel like eating, my appetite was poor," "I felt depressed," and "I felt that everything I did was an effort." Responses indicated how often in the past week the respondent had those feelings and ranged from 1 = rarely or none of the time (less than one day) to 4 = most or all of the time (5-7 days). This 22-item scale was administered during the baseline interview only.

The internal reliability of the scale will be computed for each ethnic subgroup in the sample being used for the study. This will establish if the scale is performing properly for each group. The CES-D was originally constructed to measure depressive symptomatology in the general population (Radloff, 1977). The four-factor structure of the CES-D has been found to be suitable for use with black and white English-speaking Americans (Radloff, 1977). However, comparative studies have raised questions in regards to the validity of depression scales when studying different ethnic groups (Crockett, Shen, Randall, Russell, & Driscoll, 2005). According to research the construct and meaning of depression

may be different across cultural groups (Crockett et al., 2005). Additionally, linguistic and cultural differences may influence the interpretation of the items and their relevance to depression, or actual experiences of positive affect (Golding & Aneshensel, 1991). According to Crockett et al., (2005) Latinos have a tendency to somaticize mental health issues, and report more symptoms of distress than whites.

Crockett et al., (2005) conducted a study to examine the equivalence of the CES-D for Anglo and Latino adolescents. They examined configural and metric invariance. They also examined scalar and functional equivalence. Crockett et al., wanted to find out if Latino and Anglo adolescents had the same concept of depression as the CES-D and if they did, the researchers wanted to know if the CES-D measured depression equally for Anglo and Latino adolescents. To accomplish their goal the researchers used a subsample of adolescents in grades seven through twelve ($N = 10,691$) that participated in National Longitudinal Study of Adolescent Health. The subsample was 51% female, 8,550 of the participants reported being Anglo Americans, 444 reported being Puerto Rican American, 409 reported being Cuban Americans, and 1,288 reported being Mexican Americans.

In their results Crockett et al., (2005) found mixed results for measurement equivalence of the CES-D for the adolescents. The researchers also found using confirmatory factor analysis (CFA) that the original four-factor model of the CES-D (Radloff, 1977) was supported among Anglo and Mexican American adolescents but not with Cuban and Puerto Rican adolescents.

However, full metric invariance was not supported for Mexican Americans when compared to Anglo adolescents. Three of the items in the CES-D loaded more strongly on the Negative Affect factor for Mexican American adolescents than for Anglo Americans. Therefore, a lack of full metric invariance could augment the risk of classification error. But, the differences in depression symptoms between Anglo and Mexican Americans were subtle (Crockett et al., 2005). The four-factor model of the CES-D (Radloff, 1977) was not supported for Puerto Rican or Cuban adolescents. According to Crockett et al., (2005) one possible explanation is that Cuban and Puerto Rican adolescents have a somewhat different concept of depression than Anglo Americans, which possibly leads them to report different patterns of symptoms. Consequently, the misclassification for depression is greatest with Cuban and Puerto Rican adolescents (Crockett, et al., 2005). As the majority of mothers in this study are Mexican American the CES-D should be a suitable measure.

Mother's residency status

A mother's residency status was measured by two questions which were: What is your current housing situation? Do you: own, rent your home, live with one or both of your parents, live with other family members or friends, other? This question was asked during all interviews. The second question was: What is your relationship to the other people who live in your household? To which the participant could answer: Spouse, unmarried partner, parents, other adult relative (grandparents, aunts, uncles, cousins, siblings), unrelated adult (friend, roommate, boarder), other biological/step children, related children, (siblings, cousins,

nieces, nephews), unrelated children. This question was also asked during all interviews.

A single-item variable will be created from both questions to identify mothers that reported living with their parents which will leave the remaining respondents as *Other* (1 = Live with parents, 0 = Other). The parent option from both questions will be included to better capture the number of mothers that live with their parents. It is possible that a mother might not report that she lives with her parents in the first question because she may rent, however she may reside with her parents. The second question then provides an opportunity to respond if she lives with her parents.

Mother's disability

A mother's disability was measured by two questions which were: Have you ever been diagnosed with a disability? To which a mother could answer yes or no. The second question was: Have you ever attended special education classes? To which a mother could answer yes, or no. These questions were asked during the baseline interview only.

These two questions were combined into a single-item variable. If a mother answers yes to either question she will be coded for disability (1 = Yes, 0 = No). This will provide an indicator of mothers who have been diagnosed with a disability as well as those who could possibly have a learning disability but who have not been formally diagnosed, however attended special education classes.

Number of children

The number of children a mother had was measured by two questions: Is the target child your first child? To which the mother could answer yes, or no. If they answered yes, then the number of children will be one. If they answer no, the second question was: How many children did you give birth to before? To which a mother could provide the number of children she had given birth to before. The number of children she reports as being born before the target child will be added to the number one (target child) for a total count. These variables were taken from the baseline interview. The number of children will be measured as a ratio-level variable.

Subsequent pregnancies

A mother's subsequent pregnancies were measured by a single question at each time point: Are you currently pregnant? To which the participant could answer yes, no, or I don't know, during the six month interview. During the 12 month interview the mother was asked: Are you currently pregnant? To which a mother could answer yes or no.

A single-item variable will be created and used at each time period for: Are you currently pregnant? For which answers will be yes, and no (1 = Yes, 0 = No). This will allow identifying the mothers that reported having had subsequent pregnancies.

Children's ages

The children's ages were measured by two primary questions: What date was target child born? To which the mother had to provide the month, day, and

year the baby was born. The second question was: What are the ages of all the children living with you? To which the mother had to provide the month, day and year of birth for all the children she had given birth to that lived with her. These variables were taken from the first interview the mother participated in.

Because the data contain information on the date of birth of the mother's child/children, the age of the child/children will be computed and centered on sample averages. Because the intervention is spaced by particular numbers of months, age will be coded as decimal years, or the age in months divided by 12.

Child's disability

Child's disability was measured by two questions: Has a doctor ever told you that the target child has a disability or a birth defect? To which a mother could answer yes or no. This question was asked during the baseline interview. The second question is: In the last six months has a doctor told you that (child's name) has a disability? To which the mother could answer yes or no. This question was asked during the six and 12 month interviews.

A variable will be created for each time period to indicate whether the child has been diagnosed with a disability: (1 =Yes, 0 = No). This will allow the identification of mothers who have children with a disability.

Child care

Child care problems were measured by two questions. The first question was: Overall, how adequate would you rate your child care arrangements? To which a participating mother could answer: More than adequate, adequate, inadequate, very inadequate, and not applicable. This question was asked during

the six, and twelve month interviews. The second question was: Do any of the following people look after (target child) for you when you are not present? To which a participant mother could answer: Husband/biofather, husband/not biofather, boyfriend/bio father, boyfriend/not biofather, biological father, child's grandparent, children 13 + in the family, children 12 or under in the family, other relatives, neighbor/friend, paid babysitter, child care center, other, please specify. This question was asked during the six and 12 month interviews.

A single-item ordinal variable will be used as is for the first question. Two single item variables will be constructed from the second question. The variable father as alternative caregiver will be coded yes or no (1 = Yes, 0 = No). All the categories related to the biological father will be included because the mother may be married to the father or may still be dating the father or may not be romantically involved with the father, but the father may still be is involved in taking care of the baby. For the second variable the grandparents as alternative caregivers will be coded yes or no (1 = Yes, 0 = No). The child's grandparents are included in a variable because literature has shown that young mothers who have consistent child care help from child's grandparents are more likely to be enrolled in school.

Father involvement

Father involvement at each time (FI_{it}^k) will be classified into two dummy variables: 1) the father is a co-resident, and 2) the father is not a co-resident, but is involved. The father is neither a co-resident nor involved is the reference category.

Father involvement was measured by five questions, which were: Was the father at the birth? To which the mother could respond yes, or no. The second question was: Does he have contact with the child? To which the mother could respond yes or no. If the mother answered yes, then she had to answer a third question: How often does the father usually see the child? These questions were taken from the first interview the mother participated in. The second question and third question were also asked during the six and 12 month interviews. The fourth question was: Does the baby's father live with you? To which a participating mother could answer yes, or no. This question was only asked during the baseline interview. The fifth question was: What is your relationship to the other people who live in your household? To which the participant could answer: Spouse, unmarried partner, parents, other adult relative (grandparents, aunts, uncles, cousins, siblings), unrelated adult (friend, roommate, boarder), other biological/step children, related children, (siblings, cousins, nieces, nephews), unrelated children. This question was asked during all interviews.

At baseline co-residence with the father was asked directly. At six and 12 months it was impossible to determine if the mother's response to the living situation question "boyfriend" or "spouse" referred also to the father. Therefore, if the mother reported that the father had daily contact with the baby, it will be assumed that the "boyfriend" or "spouse" is the baby's father. But if the mother reports that the baby's father has contact with the baby but it is not daily, and she also reports living with a boyfriend or spouse, the response will be coded as involved but not a co-resident.

Control Variables

The control variables will include the effects of age and ethnicity. Because the data contain information on the date of birth, the age of the mother (Mait) and the age of the father (Fait) will be computed and centered on the sample averages. Because the intervention is spaced by particular numbers of months, age will be coded as decimal years, or the age in months divided by 12.

Race/Ethnicity

The variable race was measured by one main question: How do you describe your race or ethnicity? To which the respondent could answer: white, Hispanic (originating from what country), African/American/Black, Asian/Pacific Islander, American Indian, Aleut, Eskimo, Multi-racial/Mixed, Other. This variable was taken from the first interview the mother participated in.

Two dummy ethnicity variables will be created for which the reference is the other category (e.g., Hispanic/Other, and white/Other). The majority of the participants that will be used in this study identified as Hispanic (65.5%) or white (19%), therefore, these two ethnic groups will be the focus of discussion in regards to ethnicity. For that reason, the remaining respondents will be under the category of “Other.”

Dependent Variables

The dependent variables in the study are: education and labor market participation. The variable education indicates whether a young mother is enrolled in school, and the variable labor market participation indicates whether a teen mother is employed.

Education

Education was measured by two questions: Are you currently attending school and/or in job training? To which a participant could answer yes or no. The second question was: What is the highest level of education that you have completed? To which a participant could answer: Grade school (through Junior high school), some high school, high school diploma or GED, some college, college degree, beyond college (Master's , PhD), other. These questions were asked during all interviews.

A single-item categorical variable will be used for the question: Are you currently attending school and/or in job training? For which respondents can report yes or no (1 = Yes, 0 = No). This variable will aid in the count of how many mothers are in school/job training and those that are not. An ordinal variable also exists: What is the highest level of education that you have completed? The categories for this variable will be: Grade school (through Junior high school), some high school, high school diploma or GED, some college, college degree, beyond college (Master's, PhD), other (1 = Grade school (through Junior high school), 2 = Some high school, 3 = High school diploma or GED, 4 = Some college, 5 = College degree, 6 = Beyond college (Master's, PhD), 7 = Other). This variable will be useful for obtaining descriptive information however, it is not specific enough to measure gains in education as an individual might be enrolled in school and remain in the same category at all three time periods.

Labor Market participation

Labor market participation was measured by two primary questions: Are you currently employed? To which the participant could answer yes or no. If the respondent answered yes then another question was asked: How many hours do you work in a typical week? The number of hours working for pay per week was provided. These questions were asked during all interviews.

A single item variable will be used for the question: Are you currently employed? For which the answer can be yes or no (1 = Yes, 0 = No). This variable will allow for the count of how many mothers reported being employed. A continuous variable is represented in the data for the question: How many hours do you work in a typical week? For which the hours that a mother reported working represent the hours she worked per week.

Chapter 4

RESULTS

The purpose of this study is to explore how father involvement affects the human capital accumulation of young mothers. This chapter focuses on answering the research question and testing the hypotheses of the study. In the first part of the chapter ecological theory will be used as an organizing framework to present descriptive information on the sample. The age and ethnicity of the young mothers in the study has already been discussed in chapter three. In the second part of the chapter the results for bivariate analyses are presented. This will include the results of the ANOVA examining the continuous dependent variables and the moderating variable to compare means (e.g., hours worked per week (DV), among the three categories of father involvement). The results for chi-square examine the associations between all categorical dependent variables and the categorical moderating and control variables (e.g., school/ no school and father involvement). The results of the correlations among continuous variables will be presented. This chapter will conclude with the result of the random-effects regression model (RRM).

Descriptives for Study Variables

Ecological theory will inform the order in which the descriptives are presented (e.g., microsystem, mesosystem, and exosystem). The only macrosystem variable, culture, was presented in the previous chapter to describe the sample. Additionally, Tables 3 and 4 will present categorical mother, child,

and father variables. Table 5 will present continuous mother, child, and father variables.

Microsystem

Descriptives for the young mothers' microsystems at baseline, six months, and 12 months are presented in this section. These include descriptive statistics on mother-related variables including mother's mental health, disability, substance use, number of children, child disability, children's age, child care problems, and subsequent pregnancies.

Mother's mental health/disability. The majority of the young mothers in the study did not meet clinically significant levels of psychological distress as measured by the CES-D at baseline. Approximately 4.0%, however, scored over the clinical cut off score of 16 indicating clinical levels of psychological distress. Additionally, nearly 12% ($n = 10$) of the young mothers in this study reported that they had been diagnosed with a disability at least once in the past and 9.5% ($n = 8$) of mothers reported that they had attended special education classes. The mother's diagnosis will be used to test hypothesis number five. Because there is not enough variance for mother that scored 16 or above in the CES-D this variable will not be used for any further analyses, and hypothesis number three is not testable.

Substance use. The number of mothers reporting alcohol use increased at each time examined (e.g., baseline, six months, and 12 months). As shown in Table 3, during the baseline interview 10.7% ($n = 9$) of the young mothers reported using alcohol. During the six month interview, 19.7% ($n = 15$) reported

using alcohol, and during the 12 month interview, 23.6% ($n = 17$) reported using alcohol. There were only 13.1% ($n = 11$) of mothers in the study 21 years of age. Therefore, more mothers than those of legal age reported alcohol use.

The mode for how many days in the past two weeks the participating mothers reported drinking was zero at all time points. Nevertheless, during the baseline interview, 4.8% ($n = 4$) of the mothers reported drinking one day in the past two weeks, 1.2% ($n = 1$) of the mothers reported drinking two days in the past two weeks, and 1.2% ($n = 1$) reported drinking three days during the past two weeks. Most mothers reported having less than three drinks during the days that they did drink, but 1.2% ($n = 1$) of the mothers reported drinking three or more drinks on the days she reported drinking alcohol in the past two weeks.

During the six month interview, 7.1% ($n = 6$) reported drinking one day in the past two weeks, 3.6% ($n = 3$) reported drinking two days in the past two weeks, and 3.6% ($n = 3$) reported drinking four days in the past two weeks. Most mothers reported having less than three drinks on the days that they consumed alcohol, but 4.8% ($n = 4$) reported drinking three or more drinks on one of the days that they reported drinking alcohol in the past two weeks. Additionally, 3.6% ($n = 3$) reported drinking three or more drinks on two of the days they reported drinking alcohol in the past two weeks and 1.2% ($n = 1$) of the mothers reported drinking three or more drinks on three of the days she reported drinking alcohol in the past two weeks.

During the 12 month interview, 6% ($n = 5$) young mothers reported drinking one day in the past two weeks, 7.1% ($n = 6$) reported drinking two days

in the past two weeks, and 3.6% ($n = 3$) reported drinking three days in the past two weeks. Furthermore, most mothers reported drinking less than three drinks on the days they reported drinking, however, 4.8% ($n = 4$) reported drinking three drinks or more on one day of the days they reported drinking in the past two weeks. Moreover, 3.6% ($n = 3$) reported drinking three or more drinks on two of the days they reported drinking in the past two weeks and 1.2% ($n = 1$) reported drinking three or more drinks on three of the days she reported drinking alcohol in the past two weeks.

The marijuana use of the participating mothers varied at the different points examined. During the baseline interview, 2.4% ($n = 2$) of the participating mothers reported smoking marijuana, while at the six month interview, approximately 4.0% ($n = 3$) of the young mothers reported smoking marijuana, and at the 12 month interview only 1.4% ($n = 1$) of the mothers reported smoking marijuana. All of the mothers reported not using any other drugs at all data collection points. What is more, there were no frequencies reported at any of the times examined in this study for the variable: in the past two weeks how many days did you use drugs? Only one mother reported needing drug/alcohol treatment at each time period.

A composite substance use variable was created for this study from the questions: Do you drink beer or alcohol?, Do you smoke marijuana?, and Do you use any other drugs, for example, cocaine, crack, or meth? This new substance use variable produced yes and no answers. At baseline 11.9% ($n = 10$) of the young mothers reported using substances. During the six month interview 20.2%

($n = 17$) of the young mothers reported using substances, and during the 12 month interview 21.4% ($n = 18$) of the participating mothers reported using substances.

Number of children/children's age. As shown in Table 4 approximately 73% ($n = 61$) of the participating mothers reported that the target child was their first child. The approximately 27% ($n = 23$) of mothers that reported that the target child was not their first child gave birth to between one and four additional children prior to the current birth, with most of them reporting having had one child prior to the current birth. Also, the mothers reported their additional children's ages being between one and nine years of age. But most of them reported that the age of the additional children living with them was one year of age.

Child's disability. There was a small increase between the baseline interview and the six month interview in the mother's reports that they had been told by a doctor that the target child had a disability. During the baseline interview, 1.2% ($n = 1$) of the mothers reported a doctor told her that the target child had a disability. During the six month interview, 2.6% ($n = 2$) reported that a doctor told them the target children had a disability, and during the 12 month interview, 2.8% ($n = 2$) reported that a doctor told them the target children had a disability. There is not enough variability in this variable to be used in any of the additional analyses for this study.

Subsequent pregnancies. Research has postulated that young mothers are likely to have additional unplanned or unwanted births (Scott-Jones & Turner, 1990; Brown, Saunders, & Dick, 1998). In this study, there was an increase in

reported subsequent pregnancies by the young mothers at the six and the 12 month interviews. As shown in Table 3 some 3.9% ($n = 3$) of the young mothers reported subsequent pregnancies at the six month interview, and 12.5% ($n = 9$) at the 12 month interview.

Child care. After creating a variable that would reflect the percentages of fathers that helped the young mothers with childcare, whether he was the husband, boyfriend or just reported as the biological father, overall there were increases in the reports from the six month interview to the 12 month interview. As shown in Table 4 during the six month interview, 51.5% ($n = 35$) of the young mothers reported that they had help with child care from the target baby's biological father, and during the 12 month interview, 52.8% ($n = 38$) of the young mothers reported that they had help with child care from the target baby's biological father.

The number of mothers reporting that they had help with child care from the target child's grandparents decreased slightly between the six month and the 12 month interviews. During the six month interview, nearly 85.5% ($n = 65$) of the young mothers reported that they had help with child care from the target children's grandparents when they were not around, and during the 12 month interview, 76.4% ($n = 55$) of the participating mothers reported having help with child care from the target children's grandparents. Nonetheless, most of the participating mothers reported having at least adequate child care at the six and 12 month interviews (see table 4).

Mother's financial support. The young mothers in this study reported receiving income from different sources and they include: "partner's employment," "paid family/maternity leave," "TANF," "child support," "social security income," "unemployment insurance," "money from family/friends," and "other." However, only the sources that are part of the mothers' microsystem will be discussed in this section. The mothers' reports of receiving income from "TANF," "social security insurance," "unemployment insurance," and "other" will be discussed in the exosystem section.

The mothers' reports of supporting their family with "partner's employment" money increased at the six month time point but decreased at the 12 month time point. Approximately 43% ($n = 36$) of the participating mothers reported that they supported their families with money from their "partner's employment" during the baseline interview. During the six month interview, approximately 49% ($n = 41$) of the mothers reported supporting their families with money from their "partner's employment," and during the 12 month interview, 44% ($n = 37$) of the mothers reported supporting their families with money from their "partner's employment." Nonetheless, it is not known if the partners were the target babies' fathers or if they were new people in the mothers' lives (see table 3).

The mothers' reports that they support their family with "paid family/maternity leave" was stable from the baseline time point to the six month point, but decreased at the 12 month time point. Only 1.2% ($n = 1$) of the participating mothers reported supporting her family with "paid family/maternity

leave” money during the baseline interview. During the six month interview, again only 1.2% ($n = 1$) of the young mothers reported supporting her family with “paid family/maternity leave” money and during the 12 month interview, none of the mothers reported supporting their families with “paid family/maternity leave” money (see table 3).

The mothers’ reports that they supported their family with “child support” money remained stable from the baseline time point to the six month time point, but increased at the 12 month point. During the baseline interview, 3.6% ($n = 3$) of the young mothers reported that they supported their families with “child support” money. During the six month interview, again 3.6% ($n = 3$) of the mothers reported supporting their families with “child support” money, and during the 12 month interview, 4.8% ($n = 4$) of the mothers reported that they supported their family with “child support” money (see table 3).

The young mothers’ reports of financial subsidiaries from family/friends declined at the six and 12 month interviews. During the baseline interview, 44% ($n = 37$) of the young mothers reported receiving money from family/friends to support their family. During the six month interview, approximately 37% ($n = 31$) of the participating mothers reported receiving money from family/friends to support their family and during the 12 month interview, 27.4% ($n = 23$) of the mothers reported receiving money from family/friends to support their family (see table 3).

Income. As shown in Table 5 not all participating mothers were low income. The usual monthly income mothers reported at baseline ranged from zero

to \$3,000.00 with a mean of \$608.10 ($SD = 709.66$). The usual monthly income mothers reported during the six month interview ranged from zero dollar to \$2,529.00 with a mean of \$724.62 ($SD = 705.70$). The usual monthly income mothers reported during the 12 month interview ranged from zero to \$3,300.00 with a mean of \$756.27 ($SD = 885.38$). There was a high percentage of missing values during all the time periods for this variable. At baseline there were 29% missing values, and there were 35% missing values at the six month and 12 month points. Consequently, this variable will not be used for any additional analysis in this study.

Father's age. As mentioned earlier, it is not always the case that young mothers have children with men in their age group. The mothers participating in this study reported the ages of the fathers to be between 15 and 43 years old. The average father's age was 22 years of age, ($SD = 5.48$) (see table 5). The mode was 19 years of age.

Father involvement. As shown in Table 4 at the baseline interview, 59.5% ($n = 50$) of the participating mothers reported that the target baby's father was present at the birth. The young mothers reported that 38.1% ($n = 32$) of the fathers were co-residents; however, 77.4% ($n = 65$) of the mothers reported that the father had contact with the baby at that same point. Nonetheless, the mothers' reports that the fathers had contact with the target child decreased during the first six month period to 72.7% ($n = 56$), and then decreased again to 72.2% ($n = 52$) at the 12 month period. Additionally, the mothers' reports that the father was in

contact with the baby varied at each time point examined, and ranged from daily contact to no physical contact but to talking to the baby on the phone.

After classifying variables into 1) the father is neither a co-resident nor involved with his child, 2) the father is a co-resident, and 3) the father is not a co-resident, but is involved it was found that during the baseline interview that 22.6% ($n = 19$) of the fathers were neither a co-resident nor involved, 38.1% ($n = 32$) were co-residents and 39.3% ($n = 33$) were not co-residents but were involved. During the six month interview, 26% ($n = 20$) of the mothers reported that the fathers were neither co-residents nor involved, 11.7% ($n = 9$) were a co-resident, and 62.3% ($n = 48$) were not co-residents but were involved. During the 12 month interview, 25% ($n = 18$) of the mothers reported that the fathers were neither co-residents nor involved, 13.9% ($n = 10$) were co-residents and 61.1% ($n = 44$) were not co-resident but were involved. See table 4 for frequencies of co-residence.

Mesosystem

In this section the descriptives for the variables from the participating mothers' mesosystem will be presented and include: mother's residency status, education, and employment participation.

Mother's residency status. The residency status of the mothers in this study varied from living with parents, to living with a spouse, and changed over time (see Table 3). During the baseline interview, 28.6% ($n = 24$) the young mothers in this study reported living with their parents. During the six month

interview, the reports of living with parents by the mothers dropped to 21.4% ($n = 18$) but then went up to 26.2% ($n = 22$) during the 12 month interview.

The mothers' reports of living with a spouse increased slightly during the six and 12 months interviews. During the baseline interview, 9.5% ($n = 8$) of the young mothers reported living with a spouse (see Table 3) During the six month interview, 10.7% ($n = 9$) of the mothers reported living with a spouse and during the 12 month interview approximately 12% ($n = 10$) of the young mothers reported living with a spouse. However, as mentioned earlier it is not possible to know if the mothers were residing with the target child's father or if they were living with someone else.

Education. The school attendance of the young mothers in this study appeared to have increased at each time examined (see Table 3). During the baseline interview, 19% ($n = 16$) of the participating young mothers reported attending school. During the six month interview, 24.7% ($n = 19$) of the mothers reported being in school, and at the 12 month interview, 27.8% ($n = 20$) of the young mothers reported being in school.

After analyzing the data on the highest level of education completed by the participating mothers it was found that between the baseline time point and the six month time point three mothers moved up a level from "grade school" to "some high school" and one mother moved up one level from "some high school" to "high school /GED." Also between the baseline time point and the six month time point seven mothers moved up one level from "high school/GED" to "some

college” and two mothers moved up one level from “some college” to “college degree.”

It was also found that between the six month time point and the twelve month time point two mothers moved up a level from “grade school” to “some high school” and five mothers moved up one level from “high school/GED” to “some college”. Additionally, it was found that one mother moved up one level from “some college” to “College degree.”

Labor market participation. The labor market participation of the mothers in this study showed modest increases at the different times examined. During the baseline interview, 19% ($n = 16$) of the young mothers reported being employed (see Table 3). During the six month interview, 35.1% ($n = 27$) reported being employed and during the 12 month interview approximately 39% ($n = 28$) reported being employed. Additionally, most mothers reported working 30 hours per week at baseline. Most employed mothers reported working of 40 hours per week at the six and 12 month periods. The mean hours employed varied at each time point, during the baseline interview, the participating mothers reported working an average of 31.19 hours per week ($SD = 8.73$) (see Table 5) During the six month interview, the mean increased to an average of 33.30 ($SD = 9.41$) hours per week, and during the 12 month interview the participating mothers reported working an average of 32.75 hours per week ($SD = 11.33$).

Exosystem

The variables from the young mothers’ exosystem will be discussed. These variables include: “TANF” participation, “social security income,”

“unemployment insurance,” and “other.” The TANF participation of the mothers in this study will be discussed next.

TANF participation. Not many of the mothers in this study received TANF benefits, although many of the mothers come from low income backgrounds. The number of participating mothers reporting that they supported their family with TANF funds was stable over time. As shown in Table 3 during the baseline interview and six month interview 16.7% ($n = 14$) of the participating mothers reported supporting their family with TANF funds, but during the 12 month interview, 15.5% ($n = 13$) of the mothers reported supporting their families with TANF funds.

Social Security income. The mothers’ reports that they supported their family with “social security income” increased from the baseline time point to the six month time point, but decreased during the 12 month time point. During the baseline interview, 9.5% ($n = 8$) of the mothers reported that they supported their families with “social security income.” During the six month interview, 10.7% ($n = 9$) of the mothers’ reported supporting their families with “social security income,” and during the 12 month interview, 6% ($n = 5$) of the mothers reported supporting their families with “social security income.”

Unemployment insurance. There were no reports of mothers’ supporting their families with “unemployment” insurance money during the baseline interview or the 12 month interview. During the six month interview, 1.2% ($n = 1$) of the mothers did report supporting her family with “unemployment insurance.”

Other. During the baseline interview 71.4% (60) of the mothers reported that they supported their families with “other” means. The majority of the mothers that reported supporting their families with “other” means reported that they received WIC benefits (Special Supplemental Nutrition Program for Women, Infants, and Children) to support their families. At the six month interview 76.2% ($n = 64$) of the young mothers reported that they supported their families with “other” means, and during the 12 month interview 66.7% ($n = 56$) of the mothers reported supporting their families with “other” means. During the six month interview and the 12 month interview most of the mothers reported supporting their families with food stamps.

Table 3. Descriptive Characteristics for Mothers

Variables	Baseline (<i>N</i> = 84)	Six months (<i>N</i> = 77)	Twelve months (<i>N</i> = 72)
Alcohol use			
yes	10.70%	19.70%	23.60%
no	89.30%	80.30%	76.40%
Marijuana use			
yes	2.40%	3.90%	1.40%
no	97.60%	96.10%	98.60%
Disability			
yes	11.90%	n/a	n/a
no	88.10%		
Subsequent pregnancies			
yes	n/a	3.90%	12.50%
no		96.10%	87.50%
Financial support			
partner's employment	42.90%	48.80%	44.00%
family/friends	44.00%	36.90%	27.40%
social security income	9.30%	10.50%	5.80%
unemployment	0.00%	1.20%	0.00%
child support	3.60%	3.60%	4.80%
Lives with parent(s)			
yes	28.60%	21.40%	26.20%
no	71.40%	78.60%	73.80%
Lives with spouse			
yes	9.50%	10.70%	11.90%
no	90.50%	89.30%	88.10%
Enrolled in school			
yes	19.00%	24.70%	27.80%
no	81.00%	75.30%	72.20%
Highest level of education			
Grade school	8.30%	6.60%	3.60%
Some high school	42.90%	46.10%	44.00%
High school/GED	36.90%	26.30%	13.10%
Some college	10.70%	14.50%	19.00%
College degree	n/a	2.60%	1.20%
Employment participation			
yes	19.00%	35.10%	38.90%
no	81.00%	64.90%	61.10%
TANF participation			
yes	16.70%	16.70%	15.50%
no	83.30%	83.30%	84.50%

Note: n/a means not measured at time period

Table 4. Descriptive Characteristics for Fathers and Children

Categorical Variables	Baseline (<i>N</i> = 84)	Six months (<i>N</i> = 77)	Twelve months (<i>N</i> = 72)
Alternative care by biological father			
yes	n/a	51.50%	52.80%
no		48.50%	47.20%
Alternative care by grandparents			
yes	n/a	85.50%	76.40%
no		14.50%	23.60%
Child care			
More than adequate	n/a	40.80%	34.70%
Adequate		47.40%	47.20%
Inadequate		2.60%	6.90%
Not applicable		9.20%	11.10%
Father present at birth			
yes	59.50%	n/a	n/a
no	40.50%		
Father in contact with child			
yes	77.40%	72.70%	72.20%
no	22.60%	27.30%	27.80%
Father is co-resident			
yes	38.10%	11.70%	13.90%
no	61.90%	88.30%	86.10%
Baby is first child			
yes	72.60%	n/a	n/a
no	27.40%		

Note: n/a means not measured at time period

Table 5. Descriptive Characteristics of Sample

Continuous Variables	Baseline	Six months	Twelve months
	(<i>N</i> = 84)	(<i>N</i> = 77)	(<i>N</i> = 72)
	Mean (<i>SD</i>)	Mean (<i>SD</i>)	Mean (<i>SD</i>)
CES-D Scores	4.67 (4.64)	n/a	n/a
Days drinking in past two weeks	1.00 (1.00)	1.60 (1.40)	1.53 (1.01)
Hours worked per week	31.19 (8.73)	33.30 (9.41)	32.75 (11.33)
Number of children	1.48 (.99)	n/a	n/a
Monthly income	\$ 608.10 (709)	\$ 724.62(705)	\$ 756.27 (885)
Father's age in years	22.05 (5.42)	n/a	n/a
Mother's age in years	18.46 (1.83)	n/a	n/a

Note: n/a means not measured at time point

Bivariate Analyses

Because significance tests are useful guides when deciding if certain variables are or are not needed for the explanation of the dependent variable in a regression (Cohen, Cohen, West, & Aiken, 2003), correlation analyses, chi-square analyses and ANOVA analyses were preformed. Additionally significance testing aids in determining the magnitude of correlation among sets of variables. When high correlations exist between independent variables multicollinearity can occur, meaning that as a variable becomes increasingly correlated, the estimates of the individual regression coefficient become more and more unreliable and provide

less unique information (Cohen, Cohen, West, & Aiken, 2003). According to Green and Salkind, (2008) correlation coefficients of .10 irrespective of sign are considered small, correlation coefficients of .30 irrespective of sign are by convention interpreted as medium, and correlation coefficients of .50 irrespective of sign are considered large coefficients (Green & Salkind, 2008).

ANOVA

A one-way ANOVA was conducted to compare the difference in means among the different levels of father involvement (e.g., 1) the father is neither a co-resident nor involved, 2) the father is a co-resident, and 3) the father is not a co-resident, but is involved) on the variables: number of children, number of hours worked per week, work earnings in the past two weeks, and monthly income. As shown in Table 6 these relationships are examined at all three time points: baseline, six and 12 months.

As shown in Table 6, at baseline there was a statistically significant difference in mother's mean monthly income across the three categories of father involvement $F(2, 81) = 10.17, p = .000$. Tukey post-hoc comparisons of the three levels of father involvement indicated that when the father was a co-resident ($M = 985.69, SD = 800.28$) a mother's monthly income is \$716.14 more than when the father is not a co-resident, but is involved ($M = 269.55, SD = 357.74$), $p = .000$. However, the mean monthly income when the father is a not a co-resident nor involved ($M = 560.16, SD = 725.08$) did not differ significantly from the other two conditions. All other comparisons were not statistically significant (e.g., number of children, hours worked per week, and work earnings in the past week).

As shown in Table 6, at the six month point, there was a statistically significant difference across the three categories of father involvement on a mother's monthly income at the $p < .05$ level for the three conditions, $F(2, 74) = 3.74, p = .03$. Tukey post-hoc comparisons of the three levels of father involvement indicated that when the father was not a co-resident, but was involved ($M = 937.60, SD = 725.16$), a mother's monthly income was \$ 492.20 more than when a father was not a co-resident nor involved ($M = 445.40, SD = 503.44$), $p = .02$. However, when the father was a co-resident ($M = 772.78, SD = 739.12$) income did not differ from the other two conditions. All other comparisons at six months were not statistically significant (e.g., hours worked per week, and work earnings in the past week). After looking at these results it was noted that there were only two groups (e.g., father is not a co-resident nor is involved, and father is not a co-resident but is involved) for the variables number of hours worked per week and work earnings per week in the ANOVA. Therefore, it was decided to perform an independent-samples t test between the two groups and the variables number of hours worked per week and earnings in the past week. The independent-samples t test between the two groups of father involvement and number of hours worked was not statistically significant, $t(66) = .325, p = .75$. The independent-sample t test between the two groups of father involvement and earnings in the past week was not statistically significant either, $t(66) = .634, p = .53$ (see Table 6).

At the 12-month point, there was a significant difference in mother's income at the $p < .05$ level for the three conditions of father involvement, $F(2, 69)$

= 5.88, $p = .01$. Turkey post-hoc comparisons of the three levels of father involvement indicated that when a father was a co-resident ($M = 1007.57$, $SD = 236.43$) the mother's monthly income was \$862.89 more than when the father was not a co-resident, but was involved ($M = 549.10$, $SD = 1100.12$), $p = .01$. However, when a father was not a co-resident, nor involved ($M = 298.48$, $SD = 853.63$) the amount of monthly income did not differ from the other two conditions. As shown in Table 6, all other comparisons were not statistically significant (e.g., hours worked per week and work earnings in the past week).

Table 6. ANOVA Results for Father Involvement

Variables	Father involvement			<i>F</i> (<i>p</i> =)
	No contact	Resident	Contact/not resident	
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	
Monthly Income				
0	560.16 (725.09)	985.69* (725.09)	269.54* (357.74)	10.17 (.00)
6	445.40* (503.44)	772.78 (739.12)	937.60* (725.16)	3.74 (.02)
12	576.06* (558.18)	1,687.50* (950.48)	824.61 (906.20)	5.89 (.00)
Number of children				
0	1.63 (1.01)	1.34 (.79)	1.33 (.78)	.90 (.41)
6	n/a	n/a	n/a	n/a
12	n/a	n/a	n/a	n/a
Earnings per week				
0	116.67 (202.07)	224.25 (200.00)	162.50 (197.38)	.35 (.71)
6	402.14 (176.65)	n/a	438.55 (220.44)	.63a (.53)
12	426.88 (232.29)	370.00 (321.40)	453.53 (229.00)	.17 (.85)
Number of hours worked				
0	5.26 (12.63)	7.47 (14.11)	4.85 (11.96)	.36 (.69)
6	34.71 (7.11)	n/a	32.80 (10.21)	.32a (.75)
12	35.63 (9.09)	37.33 (2.52)	30.59 (12.91)	.80 (.46)

Note: *N* at 0 = 84 (baseline), *N* at 6 = 77 (6 months), and *N* at 12 = 72 (12 months).

Asterik indicate significant groups from post hoc testing.

n/a means not measured at that time point.

a = *t* test

Chi-square results for categorical variables

Chi-square analyses were performed to evaluate the association between father involvement and school attendance, and labor market participation. Chi-square analyses were also performed to evaluate the association between a mother being Hispanic and school attendance, labor market participation, and father involvement as well as, the association between a mother being white and school attendance, labor market participation, and father involvement. All of the chi-square analyses were conducted using a one-tailed test.

School attendance

A chi-square test was conducted to evaluate the association between school attendance by the mother and father involvement at baseline. As shown in Table 7 this association was not significant, $X^2(2, N = 84) = 3.08, p = .21$. This association was also examined at the six month point and the association was found to not be significant, $X^2(2, N = 77) = 1.56, p = .46$. The association between school attendance by the mother and father involvement was examined at 12 months and it was found that the association was not significant, $X^2(2, N = 72) = 3.69, p = .16$.

Labor market participation

At baseline a chi-square analysis was conducted to evaluate the association between labor market participation by the mother and father involvement. As shown in Table 7 this association was not statistically significant, $X^2(2, N = 84) = 1.19, p = .55$. This association was also examined at the six month point, and it was found that the association was not statistically

significant, $X^2(2, N = 77) = 5.78, p = .06$. The association between labor market participation by the mother and father involvement was examined using a chi-square analysis. The association was not statistically significant, $X^2(2, N = 72) = .57, p = .75$.

Hispanic

At baseline a chi-square analysis was conducted to examine the association between a mother being Hispanic and father involvement. As shown in Table 8, the association between these variables was not statistically significant, $X^2(2, N = 84) = .86, p = .65$. This association was also examined at the six month point and it was found to not be significant, $X^2(2, N = 77) = .36, p = .83$. Another chi-square analysis was conducted to examine the association between a mother being Hispanic and father involvement at the 12 month point. It was found that this association was not statistically significant, $X^2(2, N = 72) = .24, p = .88$.

At baseline with a chi-square analysis it was found that the association of a mother being Hispanic and school attendance was not statistically significant, $X^2(2, N = 84) = .79, p = .37$. This relationship was also examined at the six month point, and it was found that the association was not significant, $X^2(2, N = 77) = .14, p = .71$. A chi-square analysis was performed at the 12 month point to examine the association between a mother being Hispanic and school attendance and the relationship was not significant, $X^2(2, N = 72) = .34, p = .56$.

As shown in Table 8, at baseline the association between a mother being Hispanic and participating in the labor market was significant, $X^2(2, N = 84) =$

4.13, $p = .04$. It appears that when a mother is Hispanic she is less likely to be employed at baseline, 12.7% of the Hispanic mothers were employed and 87.3% of the Hispanic mothers were not employed compared to 31% of non-Hispanic mothers employed and 69% not employed. If there was no association it would be expected that 19% of the 55 Hispanic mothers would be employed ($n = 10.5$). This association was also examined at the six month point and the relationship was found to be significant, $X^2(2, N = 77) = 7.67, p = .006$. It appears that when a mother is Hispanic she is less likely to be employed, 24% of the Hispanic mothers were employed and 76% of the Hispanic mothers were not employed. If there was no association it would be expected that 35% of the Hispanic mothers would be employed. A chi-square analysis was conducted to examine the association between a mother being Hispanic and labor market participation for the 12 month point and the association was found to not be significant, $X^2(2, N = 72) = 2.77, p = .10$. At the 12 month point, it appears that when a mother is Hispanic she is as likely to be employed as the other mothers, approximately, 32% of the Hispanic mothers were employed and approximately 68% of the mothers were not employed.

White

At baseline a chi-square analysis was conducted to examine the association between a mother being white and father involvement. As shown in Table 9, this relationship was found to not be significant, $X^2(2, N = 84) = 1.81, p = .40$. This association was also examined at the six month point and it was found that the association was not significant, $X^2(2, N = 77) = .06, p = .97$. Another chi-

square analysis was conducted at the 12 month point to examine the association between a mother being white and father involvement and the association was not significant, $X^2(2, N = 72) = 1.15, p = .56$.

At baseline a chi-square analysis was performed to examine the association between a young mother being white and attending school. As shown in Table 9, the association between these variables was not significant, $X^2(2, N = 84) = .001, p = .97$. This association was examined again at the six month point and it was found that the association was not significant, $X^2(2, N = 77) = .04, p = .84$. The association between a mother being white and attending school was examined at the 12 month point using a chi-square analysis. This association did not reach significant levels, $X^2(2, N = 72) = .55, p = .46$.

Additionally, after performing a chi-square analysis to examine the association between a mother being white and a mother's labor market participation the association was found to not be significant, $X^2(2, N = 84) = .45, p = .50$. This association was also examined at the six month point and the association was found to not be significant, $X^2(2, N = 77) = 1.10, p = .29$. At the 12 month point the association between a mother being white and a mother's labor market participation was examined using a chi-square analysis. This association was not significant, $X^2(2, N = 72) = .90, p = .34$.

Table 7. Contingency Table for Father Involvement									
Variables	Father involment								
	No contact			Resident			Contact/not resident		
	0	6	12	0	6	12	0	6	12
School attendance									
yes	6.3%	15.8%	40.0%	43.8%	10.5%	15.0%	50.0%	73.7%	45.0%
no	26.5%	29.3%	19.2%	36.8%	12.1%	13.5%	36.8%	58.6%	67.3%
Labor market participation									
yes	18.8%	25.9%	28.6%	50.0%	0.0%	10.7%	31.3%	74.1%	60.7%
no	23.5%	26.0%	22.7%	35.3%	18.0%	15.9%	41.2%	56.0%	61.4%
Hispanic									
yes	23.6%	28%	23.4%	34.5%	12.0%	14.9%	41.8%	60.0%	61.7%
no	20.7%	22.2%	28.0%	44.8%	11.1%	12.0%	34.5%	66.7%	60.0%
White									
yes	25.0%	26.7%	35.7%	50.0%	13.3%	14.3%	25.0%	60.0%	50.0%
no	22.1%	25.8%	22.4%	35.3%	11.3%	13.8%	42.6%	62.9%	63.8%

Note: N at 0 = 84 (baseline), N at 6 = 77 (6 months), and N at 12 = 72 (12 months)

Asterik indicates statistical significance at $p < .05$ *

Table 8. Contingency Table for Hispanic						
Variables	Hispanic					
	Hispanic			Not Hispanic		
	0	6	12	0	6	12
School attendance						
yes	21.8%	26.0%	25.5%	13.8%	23.0%	32.0%
no	78.2%	74.0%	74.5%	86.2%	77.0%	68.0%
Labor market participation						
yes	12.7%*	24.0%*	31.9%	31.0%*	55.6%*	52.0%
no	87.3%*	76.0%*	68.1%	69.0%*	44.4%*	48.0%

Note: N at 0 = 84 (baseline), N at 6 = 72 (6 months), and N at 12 = 72 (12 months)
Asterik indicate significance at $p < .05$ *

Table 9. Contingency Table for White						
Variables	White					
	White			Not White		
	0	6	12	0	6	12
School attendance						
yes	18.8%	26.7%	35.7%	19.1%	24.2%	25.9%
no	81.3%	73.3%	64.3%	80.9%	75.8%	74.1%
Labor market participation						
yes	25.0%	46.7%	50.0%	17.6%	32.3%	36.2%
no	75.0%	53%	50.0%	82.4%	67.7%	63.8%

Note: N at 0 = 84 (baseline), N at 6 = 77 (6 months), and N at 12 = 72 (12 months)
Asterik indicates significance at $p < .05$ *

Correlations for continuous variables

Correlation coefficients were computed among the study's continuous variables for the baseline, six, and 12 month time points. These variables include: mother's age, father's age, total CES-D scores, monthly income, number of days that alcohol was consumed in the past two weeks, number of hours worked per week, number of children, and the highest level of education completed.

Baseline

There was a moderate significant correlation between the age of the mother and the age of the father at baseline, which indicates that as the age of the mother increases, the age of the father increases, $r(77) = .32, p < .01$. The correlation between the total monthly income at baseline and mothers age was significant, $r(82) = .42, p < .001$, which indicates a positive relationship between mother's age and mother's total monthly income. The correlations between a mother's age at baseline and the hours she worked per week was significant, $r(82) = .29, p < .001$, this indicates that as a mother gets older the amount of hours she works per week increase (see Table 10). Additionally, there was moderate significant relationship between a mother's age and the highest level of education completed by the mother at baseline, $r(82) = .48, p < .001$, it appears that the older the mother the higher the level of education completed at baseline. There were no statistically significant correlations at baseline between mother's age and CES-D score, number of days drinking in the past two weeks, and number of children.

The number of children a mother reported having at baseline and a mother's CES-D scores were found to have a significant correlation, $r(82) = .22, p < .05$. This would indicate that as the number of children a mother has goes up the mother's CES-D scores also go up. There were no statistically significant correlations at baseline between a mother's CES-D scores and monthly income, number of days drinking in the past two weeks, number of hours worked per week and highest level of education (see Table 10).

The results of the correlation analysis show that the small correlation between a mother's monthly income and the amount of days a mother drinks alcohol was significant at baseline, $r(82) = .24, p < .05$, this indicates that as a mother's monthly income increases, the number of days she drinks alcohol increase as well. Additionally, a medium significant correlation was found between a mother's income per month at baseline and the number of a hours a mother works per week at baseline, $r(82) = .33, p < .01$. It appears that as a mothers number of hours worked per week increase, the mother's income per month also increase. The correlation between a mother's monthly income and a mother's highest level of education completed was found to be significant at baseline, $r(82) = .25, p < .05$. This indicates that as a mother's level of education increases, the mother's monthly income increases. There were no statistically significant correlations between monthly income and number of children at baseline (see Table 10).

There were also no statistically significant correlations at baseline between number of days drinking in the past two weeks and number of hours worked per

week, number of children, and highest grade completed (see table 10).

Additionally, there were no statistically significant correlations at baseline between number of hours worked per week and number of children or highest grade completed. Furthermore, there were no statistically significant correlations at baseline between number of children and highest grade completed.

Table 10 . Summary of Correlations for the Baseline *N= 84*

Variables	1	2	3	4	5	6	7	8
1 Mother's age	1.00	0.32**	-0.13	0.42**	0.07	0.29**	0.104	0.48**
2 Father's age	0.32**	1.00	-0.15	0.15	0.20	0.12	0.21	0.26*
3 CES-D scores	-0.13	-0.15	1.00	-0.17	0.06	-0.06	0.22*	-0.09
4 Income per month	0.42**	0.15	-0.17	1.00	0.24*	0.33**	0.06	0.25*
5 Drinking days in past 2 weeks	0.07	0.20	0.06	.24*	1.00	-0.03	-0.09	0.06
6 Hours worked per week	0.29**	0.12	-0.06	.33**	-0.03	1.00	0.12	0.16
7 Number of children	0.10	0.21	0.22*	0.06	-0.09	0.12	1.00	-0.03
8 Highest level of education	0.48**	0.26*	-0.09	0.25*	0.06	0.16	-0.03	1.00

Note: ** Significant at the .01 level (2-tailed).

* Significant at the .05 level (2-tailed).

Six months

As shown in Table 11, there were no statistically significant correlations at the six month point between any of the variables used in the correlation analysis. These variables included monthly income, drinking days in the past two weeks, hours worked per week, and highest level of education.

Table 11. Summary of Correlations for Six Month Period *N* = 77

Variables	1	2	3	4
1 Income per month	1.00	0.17	0.15	0.15
2 Drinking days in past 2 weeks	0.17	1.00	0.33	0.22
3 Hours worked per week	0.15	0.33	1.00	0.04
4 Highest level of education	0.15	0.22	0.04	1.00

Note: ** Significant at the .01 level (2-tailed).

* Significant at the .05 level (2-tailed).

12 months

As shown in Table 12 at the 12 month point the only correlations found to be statistically significant were between the highest level of education completed and drinking days in the past two weeks, $r(70) = .28, p < .05$. All the other correlations were not statistically significant. The other variables included in this correlation were income and hours worked per week. No variables were excluded from the regression analysis due to high intercorrelations. All statistically significant correlations were in the low to moderate range.

Table 12. Summary of Correlations for Twelve Month Period *N= 72*

Variables	1	2	3	4
1 Income per month	1.00	0.04	0.15	0.08
2 Drinking days in past 2 weeks	0.04	1.00	-0.17	.28*
3 Hours worked per week	0.15	-0.17	1.00	-0.12
4 Highest level of education	0.08	.28*	-0.12	1.00

Note: ** Significant at the .01 level (2-tailed).

* Significant at the .05 level (2-tailed).

Random-Effects Regression Models

Two linear and two logistic random effects regression models were planned. The binary dependent variables of interest for the logistic random effects regression models were employment participation and education participation. The two continuous dependent variables were hours worked per week and level of education. An assumption of the linear regression model is that the dependent variable is normally distributed. Examining number of hours worked per week showed that this variable was not normally distributed because a number of participants had zero hours of employment. An attempt was made to create a variable to reflect the predicted probability of employment and enter it into the model, however, no variables were statistically significant in this model. The difficulty of examining hours employed as a dependent variable is that it mixes

the choice or the condition of voluntary and non-voluntary nonemployment with those who are in the workforce. To conduct a random effects regression for this dependent variable, a larger sample of young mothers in the workforce would be required.

The second linear dependent variable, highest grade completed, was also not appropriate for use in a regression equation. This variable was measured at the ordinal level, and the one-year time period was not sufficient to examine gains in education at the ordinal level of measurement. Therefore, the following sections of this chapter deal only with the two random effects logistic regression analyses.

In preparation to conduct the random-effects regression analyses three new variables were created. One of these variables was time; the other two variables were interaction variables. One of the interaction variables was time x father is involved, and the other was time x father is a co-resident. The reference category for the two dummy variables representing father involvement (co-resident and involved not a resident) was father not involved. The variables number of children and mother's age were centered.

Group assignment associated with the RCT was tested as a covariate, that is either control group participation or Healthy Families Arizona participation. Group assignment had no statistically significant effect with either dependent variable, school attendance or employment participation, and thus was excluded from further analyses.

In addition a logistic regression analysis was preformed to conduct an analysis of missing data as the overall number of young mothers decreased at

each time period. There were no statistically significant demographic differences between those young mothers who dropped out at the six and 12 month data collection points and those who did not drop out.

School attendance

The first random effects regression analyses to be discussed concerns the dependent variable school attendance. The full model was computed first with the two moderating variables father is a resident and father is involved but not a resident. The two interaction variables with time and father is a resident and father is involved were included. The independent variables included in the regression were mother lives with parents, substance use, TANF, Social Security income, mother's disability, and number of children. Control variables were Hispanic, mother's age, and time. The indicator of fit for the full model was not statistically significant.

Next, a trimmed or reduced model was computed removing those variables that were not statistically significant in the full model and including the variables related to father involvement. This model included the dependent variable school attendance and the variables father is resident, father is involved, time x father is resident, time x father is involved, mother's age, number of children, and time. All the independent variables were entered into the model simultaneously. The indicator of model fit was statistically significant for this model (See Table 13).

The regression coefficients were used to calculate the predicted probabilities of school attendance. The trend was for school attendance to increase

over time, however, this was negatively impacted by father involvement. The interaction of time x father involvement was statistically significant. Co-residence with the father was not a significant predictor of school attendance. The odds of a mother being enrolled in school when the father was involved were 12% lower than when the father was not involved. Mother's age was a statistically significant predictor of school attendance. For the average mother every additional year the probability of attending school decreased by 59%. The number of children was also negatively related to school attendance at a statistically significant level. For a mother with an average number of children every additional child she has decreased the probability of attending school by 24%.

Employment

The second dependent variable for the random effects regression analysis included the dependent variable labor market participation. The full model was ran initially including the same variables as the full model for school attendance. Again, the indicator of fit for the full model was not statistically significant.

A trimmed or reduced model including those variables that were statistically significant in the full model and the moderating variables related to father involvement and co-residence was computed. This model included the dependent variable labor market participation and the variables father is resident, father is involved, time x father is resident, time x father is involved, mother's age, number of children, and time. Again, all the independent variables were entered simultaneously. The indices of model fit were statistically significant for this model. The results show that the trend over time was for employment to

increase, and this was not moderated by father involvement, although the time by father was a co-resident interaction term did approach statistical significance ($p = .056$).

The coefficients were used to calculate the predictive probabilities of employment. Mother's age was statistically significant. For the average mother, every additional year the likelihood of being employed increased 2.9 times. Number of children was not significant.

Hypothesis Results from Analysis

In this section the study hypothesis will be discussed, as well as the findings of the study. Due to the number of hypothesis, each hypothesis will be discussed separately.

H1: Young mothers who live with their parents will increase their human capital acquisition, specifically in terms of education and employment.

There were no statistically significant effects on participation in employment or school attendance when the young mother lived with her parents.

H2: Young mothers who use illegal drugs or alcohol will not increase their human capital acquisition, specifically in terms of education and employment.

There were no statistically significant effects for substance use.

H3: Mother's age is positively related to increases in human capital acquisition.

As shown in Table 13 there were statistically significant effects for mother's age and labor market participation. However, as shown in Table 14 even though mother's age was statistically significant with regard to school attendance, it was found that for the average mother, every additional year she gained, the probability that she attended school decreased by 59%.

H4: Teen mothers who suffer from a disability will not increase their human capital acquisition, specifically in terms of education and employment.

There were no statistically significant effects on participation in employment or school attendance for mother's disability.

H5: Young mothers who receive TANF benefits will increase their human capital acquisition, specifically in terms of education and employment.

There were no statistically significant effects on participation in employment or school attendance for mothers who received TANF benefits.

H6: Teen mothers with more than one child will not increase their human capital acquisition, specifically in terms of education and employment. As shown in Table 13 there were statistically significant negative effects on school attendance for number of children, but there were no statistically significant effects on labor market participation for number of children.

H7: Young mothers who co-reside with the babies' father will not increase their human capital, specifically in terms of education and employment.

There were no statistically significant effects on participation in employment or school attendance for mothers who co-reside with the babies' father.

H8: Young mothers who are involved with fathers who are not co-residents will increase their human capital, specifically in terms of education and employment. There were no statistically significant effects on participation in employment or school attendance for mothers who are involved with a father who is not a co-resident, However, the interaction of time and father is involved but not a co-resident was statistically significant for school participation.

Table 13. Random-Effects Regression for School Attendance

Variables	Coefficients	SE	95% Confidence Intervals	
Father is resident	2.259	1.431	-0.546	5.064
Father is involved	2.324	1.346	-0.314	4.961
Time x Father is resident	-1.034	0.972	-2.940	0.870
Time x Father is involved	-2.081*	0.875	-3.780	-0.366
Mother's age	-0.527*	0.208	-0.935	-0.120
Number of children	-1.398*	0.703	-2.780	-0.020
Time	1.909*	0.780	0.380	3.437
Constant	-4.622***	1.350	-7.270	-1.976

Note: Chi-square = 14.11, $p = .05$

Asterisk mean statistical significance: *** $p < .001$, ** $p < .01$, * $p < .05$.

Table 14. Random-Effects Regression for Labor Market Participation

Variables	Coefficients	SE	95% Confidence Intervals	
Father is resident	-0.178	1.254	-2.636	2.280
Father is involved	-0.115	1.185	-2.438	2.208
Time x Father is resident	-1.802	0.942	-3.650	0.455
Time x Father is involved	-0.621	0.808	-2.204	0.96
Mother's age	1.060**	0.334	0.404	1.715
Number of children	-0.131	0.539	-1.188	0.925
Time	1.743*	0.713	0.347	3.141
Constant	-3.111**	1.12	-5.300	-0.922

Note: Chi-square = 17.09, $p = .02$.

Asterisk mean statistical significance: ** $p < .01$, * $p < .05$.

Chapter 5

DISCUSSION

Currently, and more so than in the recent past, human capital attainment is critically important for the economic well being of young mothers and their children. It is well established that the amount of human capital a young mother accumulates, in particular education, can make a difference in occupation, income level, and her and her children's quality of life over the life span. This study is important because it examines factors that can potentially lead to greater understanding of human capital attainment for young mothers.

Unlike previous studies that have examined only one tier of the ecological system, this study examined a combination of variables that are important to human capital accumulation at each level of the ecological system: the microsystem, mesosystem, exosystem and macrosystem. This study also used social exchange theory to highlight the relevance of the relationship between the young mother and the father of the baby on human capital accumulation following birth of a new baby

Literature

The literature regarding human capital accumulation of young mothers is characterized by small samples and the examination of small subsets of variables. Several relationships with young mothers' human capital attainment have emerged in prior studies and were considered for this study. In summary, it has been found that the younger the age at first birth, the less likely a young mother will graduate from high school. Additionally, the number of children a young

mother has is negatively associated with graduating from high school. The presence of young preschool age children is negatively related to labor market participation. What is more, young mothers who report more child care problems are less likely to be enrolled in or graduate from high school (Kalil & Danziger, 2000). Past research has also found that young mothers who co-resided with the baby's father were less likely to be enrolled in school or be employed (Warrick et al., 1993; Furstenberg et al., 1987). Residence with parents has been associated with participation in the workforce and attendance in school (Furstenberg et al., 1987; Unger & Cooley, 1992). Also, researchers have found an association between substance use and dropping out of school (Hill & Jepsen, 2007). The effects of cultural characteristics have been found to vary from one ethnic or racial group to another. These previous findings, combined with ecological and social exchange theory led to a set of hypothesized relationships that considered variables at each level of the ecological system, and that recognized the mother/father dyad as influential on the attainment of human capital.

Findings

Due to the multifaceted nature of the results of this study, the results are discussed separately. These results include information about the school attendance and labor market participation of young mothers.

School attendance

Using a random-effects regression model it was found that the school attendance of young mothers is negatively impacted by father involvement over time. These findings are consistent with what has been already argued in the

existing literature on young mothers' school attendance. Additionally, it was found that for an average mother, every additional year she ages her probability of attending school decreased. This finding is not consistent with previous findings in the literature. It could be possible that these results are affected by some of the mothers that already have a high school diploma, are in college, and are taking some time off after the baby's birth. It could also be possible that the results are affected by some of the mother's level of education, age, and them being involved with the father. In this study it was also found that the number of children a mother has negatively impacts her likelihood of attending school. These findings are in agreement with the already existing literature on young mother's school attendance.

Employment

In this study mother's age was statistically significantly related to employment. For the average mother every additional year she ages her likelihood of being employed increase almost three times regardless of father involvement. Employment does increase over time, however the interaction with residing with the father is in the direction of a negative trend on employment over time. In the literature it is shown that when a young mother co-resides with the baby's father she is less likely to participate in the workforce, the findings in this study are therefore consistent with previous findings.

Also in this study using a chi-square analysis it was found that Hispanic mothers were less likely to work than mothers who were not Hispanic at baseline and at the six time point. These findings are consistent with the literature. It is

possible that Hispanic mothers subscribe more to traditional gender roles and therefore, the role of caretaker is more important to them during the early months after the baby's birth. It is also possible that Hispanic mothers live with the babies' fathers and therefore, they are receiving financial support from the fathers and feel that they do not have to work for pay. This in turn could potentially affect the final results of the analysis in this study.

There were factors of employment that were not able to be examined. One of these factors was the differences between mothers that worked part time versus mothers that worked full time. This was not possible because the numbers of hours worked variable was not normally distributed. Another factor that was not examined was, if mothers were co-residing with their parents and the babies' father at the same time and how that would affect their likelihood to participate in the labor force.

Limitations

There are a number of limitations in the current study. One of the limitations of this study is sample size, due to the number of mothers ages 13- 21 years that participated in the study. Having a relatively small sample ($N = 84$) poses the possibility of a lack of significant findings. However, since increasing the sample size was not an option it was decided to use one-tailed tests which is consistent with the directional hypotheses proposed. On the other hand, the alpha level was kept at .05.

Another limitation is that the data were collected based on mother reports. This included the information on father involvement, and while this information will deepen our comprehension of father involvement, it would be ideal if we were able to have reports from the father as well as the mother. This would potentially provide greater accuracy and add the father's and the mother's perspectives (Shapiro, Krysik, & Pennar, in press). Additionally, the fact that the mother's were interviewed face-to-face could have influenced how they responded to some of the questions, therefore limiting accurate reporting due to social desirability. An example of this would be the answers to the substance use questions. The mothers' reports of alcohol use and marijuana use were low.

A third limitation is the fact that father involvement is a rich, complex, and multidimensional concept that needs substantial work to understand and measure effectively (Hawkins & Polkovitz, 1999). A description of father involvement has not been formally established. However, Lamb (1986) has proposed a three part typology of father involvement that has been indorsed by a number of researchers: 1) interaction (e.g., playing, feeding, grooming child); 2) accessibility (e.g., availability to child); and 3) responsibility (e.g., assuming care and welfare of the child). However, this description does not facilitate exploration of other forms of father involvement. The concept of father involvement should include an array of cognitive, spiritual, economic, affective, and ethical task that father do for their children (Hawkins & Polkovits, 1999).

A fourth limitation to this study is the fact that it is a secondary data analysis. In this study the data includes some variables that are not very explicit. An

example of this is a variable for which the participant is asked what her relationship is to the other people living in her household. One of the answers is “boyfriend.” However, this option does not allow the determination if “boyfriend” was a new boyfriend or the baby’s father. Also, the data includes answers to questions that are asked at one point only, but it would be optimal if it included answers to the questions for all time points. For example, the participants’ mental health was only assessed using the CES-D at baseline. This makes it impossible to analyze if a mother’s depression levels changed at different time points. What is more, the participants had given birth to a child, no more than three months prior to the interview, which can possibly affect depression levels for a mother. Additionally, the data does not include the same information of interest for this study, such as information about the mother-father relationship, gender roles and conduct disorder.

A fifth limitation is that the mothers in the study may not be representative of all young mothers. The young mothers in the study are parents of newborns at risk for child abuse and neglect, and at risk of parent/child relationship problems. Additionally, a large percentage of the mothers in the study were Hispanic. These factors may pose an issue for generalizing the results to young mothers that identify as black or other ethnic backgrounds. Also, the participating young mothers lived in a southwest metropolitan area which may make it difficult to generalize to families in rural areas or that do not live in the southwest. Nevertheless, in spite of these limitations the data permits a longitudinal,

exploratory investigation of the research question which has not been previously explored in the published literature.

The secondary data used for this study were rich in terms of the number of variables that were represented. Further analysis of employment, however, and specifically hours employed over a defined time period needs to be carried out on a larger sample of young mothers who are employed. It is not feasible to examine hours of employment as zero for those who are not employed and treat this as a continuous variable.

Implications for Social Work and Home Visitation

One of the fundamental parts of the mission of social work is to work with vulnerable populations or populations at risk and to advocate for them (NASW, 2000). Given the high poverty rates of young mothers and their children, and the chronic nature of poverty over the lifecycle, attention to young mothers' human capital by social workers is warranted. As home visitation programs such as Healthy Families Arizona proliferate as the core strategy for serving this at-risk population, it is important that home visitors address not only parenting and the prevention of child abuse and neglect, but also the quality of family life which is impacted by maternal human capital. Outside of income, maternal education and employment have been linked to less parental stress and more positive discipline practices.

This study did not show a positive human capital impact related to the Healthy Families Arizona program. This relationship needs to be explored

further in larger samples of participants and in other geographic areas where Healthy Families America and other home visitation programs are offered. It may be the case that this piece of the home visitation intervention needs to be further developed or formalized in order to realize gains that can be documented through quantitative analyses.

As home visitation models expand to be more inclusive of fathers they should focus not only on the parental and partner/spousal role of the young mother, but also on the role of maternal human capital in the family. Home visiting programs should focus on what the father of the baby and the extended family members can do to nurture the mother's participation in human capital attainment as a long-term strategy to ensure family well-being. Warrick et al., (1993) found that involving fathers as well as mothers in a teen mother dropout prevention program led to lower dropout rates for mothers.

In order to ensure that home visitors address human capital with mothers, they need to be educated on the multifaceted benefits of increasing human capital, and human capital accumulation needs to be formalized as a program component whether that is through curricula, modeling, social support, etc., or a combination of strategies. Ideally, the ability of home visitation programs to positively impact human capital in the future would build support for home visitation as a secondary prevention approach in a cost benefit sense.

Although TANF and Social Security income receipt were not significant in the multivariate analysis, they may show an impact on school attendance and employment in a larger sample. The descriptive analysis on TANF and

Social Security income receipt were somewhat surprising in terms of the take-up rate. Utilization of WIC and food stamps were also reported, pointing to the home visitor's role in connecting young mothers with available and needed resources. Receipt of child support was surprisingly low ($n = 4$ at the highest) given the proportion of out-of-wedlock births and nonresidential fathers in the sample. Home visitors may have difficulty advocating for child support benefits as they try to engage with mothers and fathers in the early stages of involvement because it is a complex issue. Mothers may not feel that they need to institute official child support when the father is voluntarily contributing, or because it may damage their relationship with the father. Also mothers may not want to report that they receive child support because they would have to claim it as income, and this may affect their eligibility to receive benefits.

This study points to the need for home visitors to know how to assist young mothers with family planning and how to delay additional pregnancies and encourage birth spacing. Number of children was negatively related to participation in school. As some models of home visiting employ lay-home visitors and non-nurse practitioner home visitors such as Healthy Families Arizona, additional training around this topic is suggested. This would include not only effective prevention strategies, but also the boundary issues around home visitor's personal beliefs related to sexual activity and family planning options.

Implications for Policy

This study has implications for social policy. Federal and state legislation addressing home visitation should explicitly include fathers because it is clear through this and previous research that fathers are involved with the young mothers of their babies to a great extent, even though marriage rates are low in the first year after birth. Furthermore, policymakers need to make sure that when policies are created to involve the biological father in programs that young mothers participate in, that enough funding is provided for that goal and that the policy is fully implemented. The impact of exosystem variables such as TANF and Social Security income were not revealed in this study, however, should be considered in studies with larger samples of young mothers.

Implications for Research

This study has implications for future research. This study was an exploratory analysis on a relatively small sample of young mothers. It is important to try to replicate these findings using larger data sets in diverse locations. Although the literature points to culture impacting human capital accumulation for African Americans, this study was not able to test this to any extent given the under representation of this group in the data. A measure of relationship quality or partner social support should also be included so that the social exchange theory can be tested more directly. Future research should ensure that consistent measures are used at each data collection period. For instance, in this study, there was only one measure of mother's depression administered at

baseline. The post partum period can affect maternal depression and thus this one measure may not have been a good representation of the mother's mental health during the first year after giving birth. The extent that the young mothers ascribe to traditional gender roles was also not considered due to the absence of such measures in the secondary data.

This study found STATA and the random-effects regression models (RRM) useful for the analysis. First, it allowed for the study of a research question and hypotheses pertaining to the timing of an event occurrence. It allowed for the testing of time-varying covariates and the testing of interactions of time and other covariates. Using interaction terms allowed for the testing of moderating effects concerning father involvement. This method is recommended for future research. The particular statistical procedure also was appropriate for use given the nested structure of the data. Random-effects regression models (RRM) have also been suggested for the analysis of clustered (e.g., schools, clinics) or longitudinal ordinal response data.

Ecological theory was useful for the overall organization of this study, regardless of the fact that not all hypothesis were found to be statistically significant. The lack of statistically significant results could potentially be due to some of the limitations of the study (e.g., sample size).

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APPENDIX A

OFFICE OF RESEARCH INTEGRITY AND ASSURANCE

To: Judy Krysik
UCENT

From:  Mark Roosa, Chair
Soc Beh IRB

Date:  10/16/2008

Committee Action: Exemption Granted

IRB Action Date: 10/16/2008

IRB Protocol #: 0810003346

Study Title: Healthy Families Arizona

The above-referenced protocol is considered exempt after review by the Institutional Review Board pursuant to Federal regulations, 45 CFR Part 46.101(b)(4).

This part of the federal regulations requires that the information be recorded by investigators in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. It is necessary that the information obtained not be such that if disclosed outside the research, it could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.

You should retain a copy of this letter for your records.

APPENDIX B

HUMAN RESEARCH CURRICULUM COMPLETION REPORT

CITI Collaborative Institutional Training Initiative

Human Research Curriculum Completion Report Printed on 7/16/2010

Learner: Rose Rojas (username: rose777)

Institution: Arizona State University

Contact Information Judy Krysik

Department: Social Work

Email: yasmeen_4@msn.com

Group 2 Social & Behavioral Research Investigators and key personnel:

Stage 1. Basic Course Passed on 07/16/10 (Ref # 4663168)

Required Modules	Date Completed	Score
Introduction	07/16/10	no quiz
History and Ethical Principles - SBR	07/16/10	3/4 (75%)
Defining Research with Human Subjects - SBR	07/16/10	5/5 (100%)
The Regulations and The Social and Behavioral Sciences - SBR	07/16/10	5/5 (100%)
Assessing Risk in Social and Behavioral Sciences - SBR	07/16/10	4/5 (80%)
Informed Consent - SBR	07/16/10	5/5 (100%)
Privacy and Confidentiality - SBR	07/16/10	2/3 (67%)
Research with Prisoners - SBR	07/16/10	4/4 (100%)
Research with Children - SBR	07/16/10	4/4 (100%)
Research in Public Elementary and Secondary Schools - SBR	07/16/10	4/4 (100%)
International Research - SBR	07/16/10	3/3 (100%)
Internet Research - SBR	07/16/10	4/4 (100%)
HIPAA and Human Subjects Research	07/16/10	2/2 (100%)
Workers as Research Subjects-A Vulnerable Population	07/16/10	4/4 (100%)
Conflicts of Interest in Research Involving Human Subjects	07/16/10	2/2 (100%)

Arizona State University	07/16/10	no quiz
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For this Completion Report to be valid, the learner listed above must be affiliated with a CITI participating institution. Falsified information and unauthorized use of the CITI course site is unethical, and may be considered scientific misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Course Coordinator