THE ECONOMICS OF TEENAGE FERTILITY IN OKLAHOMA

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CHAPTER I

INTRODUCTION

In recent years the issue of teenage fertility in the United States has become a major public concern. Although teenage birth rates for the nation have been declining, the burden to society from this phenomenon is becoming increasingly apparent. Teenage pregnancy pervades all socioeconomic classes. Its consequences are exacerbated, however, when the parents have low educational attainment and low income earnings potential, and are themselves the children of teenage parents. The children of most teenagers are likely to be raised in a one-parent environment, leaving in doubt their prospects for achieving even a modest standard of living as adults.

Dimensions of Teenage Fertility in Oklahoma

Currently, the United States has the highest teenage fertility rate (i.e., number of teenage births per 1,000 teenage girls, 15-19 years old) of any industrialized country in the world. Oklahoma has a reputation as a state with teenage fertility rates well above the U.S. average. When compared to other states, Oklahoma ranks 8th nationally in teenage birth rates for the year 1985. Although it compares

unfavorably in this regard to most other states, Oklahoma's teenage birth rate varies considerably within the state; some counties have substantially higher rates than the national teenage average of 64.2 and some have much lower rates. In 1987, the teenage fertility rate ranged from 22 in Payne County to 114 in Greer County.

Although there has been a downward trend in Oklahoma teenage birth rates since 1982, the percentage of births to unwed teenagers has increased over the same time period. Unwed teenage mothers are less likely to be able to support themselves and their children. Seventy percent of unwed teenage mothers go on public assistance within a year, and many continue to rely on this source of support for extended periods. Several researchers (Moore, 1980; Menken, 1976, Furstenberg, 1979) have estimated that the costs American society incurs as a result of teen childbearing are substantial. Thus, it appears that government intervention to help reduce the incidence of adolescent childbearing is warranted. There is considerable uncertainty, however, about what policies and programs government should pursue to effectively address the issue.

Purpose of the Study

Within the discipline of Economics there is substantial literature on the topic of fertility. Relatively little attention has been devoted, however, to the issue of teenage fertility. The decision-making process of adolescents who

make choices about whether or not to become pregnant and/or bear a child can be modeled in the context of an economic framework.

The purpose of this dissertation is to provide an economic analysis of some of the principal issues associated with teenage fertility within the state of Oklahoma. A decision-making model of wanted and unwanted pregnancies is employed to estimate the impact of sociological, psychological, economic, and policy-related variables on the probability of adolescent childbearing. Regional variation in these variables is expected to be significant. Thus, this study also considers the effect of residential location of teenage girls on adolescent childbearing within Oklahoma.

Application of Economic Theory to Teenage Sexual Behavior

The science of economics assumes that individuals are rational in the sense that they are able to determine (within limits) what they want and will attempt to fulfill as many of their wants as possible. The degree to which they are able to do this depends on the resources at their command and the strength of their desire to surpass barriers which obstruct the attainment of their objectives (McKenzie and Tullock, 1989). Because of uncertainty surrounding certain decision-alternatives, individuals will choose the alternative which maximizes <u>expected</u> value. People sometimes err in their judgements because of incomplete information; but, this does not nullify the validity of the assumption of rational behav-

ior.

The issue of teenage fertility is complex, and the majority of teenage pregnancies are unintended. This does not mean, however, that teenagers are not rational in their fertility decision-making. Poor choices may simply be the result of incomplete information.

It is reasonable to assume that most teenagers derive utility from engaging in sexual intercourse. In many cases, however, incomplete information prevents them from knowing the full extent of the consequences of doing so. Thus, many teenagers make mistakes (i.e. fail to use effective contraception) and unintentionally become pregnant.

Although microeconomic theory assumes that individuals' preferences are stable over time, it does not attempt to ascertain how or why individuals have or form the preferences they do. In many cases, where individual preferences come from is of little significance; it is sufficient simply to acknowledge that they exist and have certain heuristic properties. Sexual and reproductive behavior, however, appear to be more related to preference formation than to the process of making choices founded on preferences already established (McKenzie and Tullock, 1989). Gary Becker (1988) points out that differences in behavior are not normally explained by differences in preferences, rather they are explained by sizable disparities between incomes and prices across individuals. It is expected that differences in individuals' incomes and the prices or costs they face will be important in

explaining differences in human sexual and reproductive behavior. It is important to acknowledge, however, that there may be substantial differences in individuals' preferences regarding fertility decision alternatives. Many teenagers may have strong negative attitudes toward acceptability of contraceptive usage and/or abortion. Others may have relatively indifferent feelings toward these practices. An individual's perceived benefits and/or costs associated with fertility decision alternatives will be partially determined by her attitudes toward acceptable and unacceptable sexual and reproductive practices. Teenage fertility decision-making can be explained by differences in individual preferences as well as differences in income and prices. Rather than focusing exclusively on differences in individual preferences, incomes, or prices, it will be helpful to examine the effects of all three on adolescent fertility behavior. Additionally, it is important to identify the factors which account for differences in preferences across individuals. A theory which incorporates the notion that preferences, as well as incomes and prices, vary across individuals will provide additional insight into the unintentional nature of teenage fertility.

Sources of Data

Primary and secondary sources of data are used for this study. This dissertation draws largely on data reported in the Census of Population and Housing for Oklahoma (Bureau of

the Census, 1980). Census data are structured such that individual-specific information is available for the measurement of many of the variables to be employed in this study. Because these data are classified on a regional basis, regional variation in the probability of adolescent childbearing can be identified and analyzed.

In an effort to obtain data on family planning services and sex edcuation, two separate survey questionnaires were developed and distributed to social service agencies and local school districts across the state.

Contributions to the Literature

This study contributes to the social science literature by improving the existing methodology for analyzing adolescent fertility behavior. The method of analysis employed in this study has three distinct features. First, the empirical analysis is based on individual data and proxies for the influence of environmental factors associated with where an individual lives. Second, the model acknowledges that there are stages of fertility decision-making. Third, the model includes a comprehensive mixture of explanatory variables from the various social sciences. Thus, it has a broader scope than that of previous studies.

An important contribution of this dissertation is that it is conducive to replication. Because census data are published every ten years for all fifty states, it is possible to update the results of this study for Oklahoma. It is also

possible to apply the methodology of this study to other states. Thus, the generic nature of the model, combined with the relative ease of obtaining much of the appropriate data, should make this dissertation a useful tool for future research.

Outline of the Dissertation

The dissertation is constructed as follows. Chapter II is a review of the literature. Chapter III contains the theoretical framework, or model, of the fertility decision-making process. Chapter IV is an exposition of the methodological procedures used to operationalize the model. Chapter V presents the findings of the empirical estimation of the model. Chapter VI includes the policy implications and conclusions of the study.

CHAPTER II

LITERATURE REVIEW

Adolescent fertility has been examined from a number of different perspectives. Many researchers have examined the determinants of adolescent sexual activity and contraceptive usage. Others have looked at factors which influence pregnancy resolution decision-making. A few studies have focused on regional variation of teenage fertility rates. In the pages that follow, the results of many these studies are discussed.

Interstate Comparisons of Adolescent Fertility

No studies have been identified which specifically address the issue of intrastate variation of adolescent fertility rates. However, researchers have conducted studies which address the issue of interstate variation in adolescent fertility rates. Each study employs a distinct research methodology; many of the results and conclusions are similar, across studies, however.

The teenage fertility rate in the United States varies considerably across state bounds. Given the diversity in social norms, economic factors, and public policies across states, this is not an unexpected phenomenon. Carolyn Stout

Morgan (1983) investigated the relationship between adolescent fertility and a series of variables which represent the degree of "modernity" within a state. Morgan defines states with high degrees of modernity as having high concentrations of individuals living in urban areas, a relatively low percentage of the population categorized as fundamentalist in their religious beliefs, and having high per capita incomes. Morgan also used a region variable as an indicator of a state's degree of modernity. Southern states are considered by her to be less modern and nonsouthern states are viewed as more modern.

Morgan used a set of intermediate variables which represents a measure of a teenager's exposure to sex. Those variables are: (1) percent of 15-19 year old females who are married, (2) percent of 15-19 year old females whose need for family planning services is unmet, (3) liberal or restrictive laws for age of consent for access to contraceptive services, and (4) a state's abortion-to-live birth ratio.

Morgan hypothesized that the more modern a state is, the lower will be the adolescent fertility rate. Using path analysis, she attempted to sort out the impact of the modernity variables from the impact of the intermediate variables on teenage fertility rates for all fifty states. Her results showed that the region variable was the single most important variable in explaining interstate variation in teenage fertility rates. The percent of females aged 15-19 years old who are married had a strong positive effect on teenage fer-

tility, and the abortion-to-live birth ratio was found to have a strong negative influence on fertility rates.

Morgan relies on Elazar's (1966) definition of distinct political cultures to explain the strong relationship between the region variable and teen fertility rates. These cultures are categorized into three groups: moralistic, individualistic, and traditionalistic. In the tradionalistic culture, policy decisions rest in the hands of an elite group that is not very concerned with programs that benefit the masses. Elazar found that traditionalistic states have a lower level of funding for education and welfare. Thus, funding limitations in these areas may work against the reduction of fertility rates, particularly for teenagers. Based on Elazar's definition, nine southern states are considered to be purely traditionalistic and five other southern states (including Oklahoma) are mainly traditionalistic. When policies are sensitive or controversial, such as sex education, contraception, and abortion, their acceptance tends to be slow. Therefore, if sex education, contraceptive usage and availability, and abortion availability influence teenage fertility rates, it would seem that the importance of state policies in these matters is enhanced. Morgan, however, does not explicitly consider the efficacy of state policies regarding these variables as means of reducing teenage fertility rates.

Using a different data set, but many of the same independent variables, Brann (1978) also examined interstate variation in teenage fertility. His study shows that the per-

cent of a state's population that is black is highly and positively associated with teen fertility rates. Additionally, the abortion ratio (number of abortions per 1,000 live births to women ages 15-19) was found to be negatively related to teen fertility rates.

Both the Brann and Morgan studies focus on the state teenage fertility rate as the dependent variable. In a more recent study, Singh (1986) examined the impact of various demographic, social, and political variables on the rates of teenage fertility, pregnancy, and abortion for all fifty states. After controlling for the percent of a state's population that is black, poor, and living in urban areas, this study finds that social factors tend to be more important determinants of state differences in adolescent fertility rates than are policy related variables.

Singh employs a series of indicators of social integration as proxies for the social climate that influences the behavior of teenagers. High rates of population growth, high rates of crime, suicide, stress, and a large circulation of sexually explicit magazines are all associated with high rates of teenage pregnancy and fertility. Generally, Singh's results show that states with lower social integration as measured by the indicators above provide environments in which more adolescents will likely become pregnant, have abortions, and experience early motherhood.

Singh also examines the influence of policy-related factors, such as education, state aid, sex education,

abortion availability, and family clinic services. From her results, Singh concluded the following:

- States in which public expenditures per student for education are high tend to have relatively high adolescent pregnancy and abortion rates and low rates of fertility.
- More generous state AFDC coverage is not acting generally as an incentive for teenage childbearing.
- A higher proportion of senior high school students receiving sex education is strongly and significantly associated with a low pregnancy rate.
- The availability of medicaid funding for abortions is associated with a higher abortion rate.
- There is a significant negative association between the percent of teenagers served by a family planning clinic and the teenage birthrate.

Only a small number of states have high teen birth rates and high abortion rates, or low teen birth rates and low abortion rates. Singh argues that extremes in pregnancy rates are determined primarily by a greater prevalence of unintended conceptions in states with higher pregnancy rates; the use of contraceptives merely represents the level of sexual activity in the population. The general social milieu in which teenagers live seems to be the most important factor explaining their levels of fertility, abortion, and pregnancy.

A comprehensive study by Moore (1980) investigated the policy determinants of teenage childbearing. Using the state teenage fertility rate as a dependent variable, Moore examined the impact of the following public policy variables for all fifty states:

- state AFDC benefit level
- state AFDC acceptance rate
- state level of Medicaid benefits
- state provision of food stamps
- state coverage of unborn children by government programs
- availability of family planning clinic services
- age of consent laws for contraceptive usage
- availability of abortion services
- age of consent laws for abortion services

The findings of this study support several of Singh's findings. Specifically, Moore found no evidence that public assistance policies are an economic incentive to adolescent childbearing. Relatively liberal AFDC benefits, higher Medicaid health payments and higher food stamp payments were not found to predict higher teen fertility rates.

A common thread to the four studies summarized above is that social factors were found to be more important than public policy factors in explaining teenage fertility. The author of each of these studies claims to have incorporated economic factors into his/her research. However, a thorough examination of the economic incentives associated with adolescent childbearing is beyond their purview.

In each of these studies, the primary focus was placed on the aggregate behavior of a group of individuals. In an effort to avoid the "ecological fallacy" (associations based on measures for geographic areas are interpreted in terms of the behavior of individuals), the interpretations of their findings are restricted to a <u>macro-level</u> analysis (i.e. state level analysis). None of these studies treats the teenager as a rational economic agent who weighs the expected costs and benefits associated with her sexual behavior and makes

decisions accordingly.

Empirical Studies of Adolescent Fertility Decision-making

Psychological Factors

Although the results of studies that have examined the impact of sociological, policy-related, and economic variables vary widely, some researchers believe that certain psychological factors contribute substantially to the incidence of adolescent childbearing. In this view, adolescents are characterized as having low self-esteem, limited cognitive ability, and unrealistic expectations about their lives. Studies have found that pregnant teenagers typically are dissatisfied with their own capabilities and in many cases are attempting to fill a void in their lives by having a baby (Falk, et al. 1981, and Schneider, 1982). Some teens, faced with a lack of hope about the future, and a sense of lost opportunity and economic insecurity, perceive the option of pregnancy as highly desirable. Some researchers believe that a lack of maturity prevents some teens from understanding the consequences associated with irresponsible sexual behavior and the costs of childbearing and childrearing (Smith et al. 1982).

A recent study by Abrahamse, Morrison, and Waite (1988) suggests, however, that the decision to become pregnant may be quite rational and well-thought-out by some adolescents. Using a theory known as problem-behavior, they examined

teenagers who were willing to consider single parenthood. This theory postulates that certain people exhibit behavior characterized by a cluster of alienation, rebelliousness, and certain types of risk-taking. Because problem-behavior theory accounts for the reported willingness to become parents as adolescents, the authors argue that economic theory can provide a complementary perspective. That is, a teenager's seemingly irrational willingness to consider nonmarital childbearing might make sense when framed in terms of expected costs and benefits. It was determined that the willingness to consider single motherhood is a function of patterns of nonconforming behavior, educational opportunity costs, and self reported depression, which may be a proxy for low self-esteem.

On the surface it appears that the decision to become a teenage parent is impulsive and highly irrational. However, Gary Becker (1962) points out that seemingly irrational behavior on the part of any economic agent does not keep them from responding to the costs and benefits associated with a decision. Becker contends that "irrational units would be forced by a change in opportunities to respond rationally." (p.11) This seems to be what happens to many teenagers who are faced with a change in available alternatives regarding sexual behavior. Although their behavior may appear to be irrational, teenagers' decision-making represents rationality because they seem to be responsive to economic stimuli (i.e. to changes in opportunity costs).

The findings of a study by Sklar and Berkov (1974) support Becker's assertion regarding rational behavior. They conclude that changes in the penalty-reward structure surrounding teenage childbearing in the United States is a primary cause of increases in teenage illegitimacy. Incentives for single motherhood have remained strong, while penalties against it have been greatly diminished.

For many teenage women, having a baby continues to be a rewarding experience, particularly where there is a lack of viable and satisfying alternatives to motherhood. Sklar and Berkov state (1974 p.89): "Although it does not seem likely that teenagers purposefully become pregnant to get public assistance benefits, these benefits reduce/increase the net cost/benefit associated with childbearing." They also point out, that prior to 1960, unwed mothers and their children were often treated in cruel ways. Modern humanitarian attitudes and social welfare programs have effectively reduced the cost of adolescent childbearing.

Adolescent Sexual Activity

There are numerous empirical studies in which researchers have attempted to ascertain the underlying factors which influence a teenager's choice regarding sexual intercourse (see Furstenberg, et al. 1985, 1987). The decision to engage in sexual intercourse has been analyzed from a number of perspectives. Most studies have emphasized one or more of the following questions: How effective are school sponsored sex

education programs in reducing sexual activity among teenagers? What effect do the attitudes of peers and parents have on this decision? How important is the impact of religiosity on the teen's choice in this matter? These questions are difficult to answer empirically, primarily because the data for sexual activity among adolescents is extremely limited. Nevertheless, researchers have tried to answer these questions.

Sex Education in the United States. Curriculum guidelines for sex education are often developed at the state level. The localized nature of curriculum implementation, however, has resulted in large variation in the types and content of sex education courses offered across school districts as well as the age at which students are first exposed to these courses (Orr, 1982). Some courses are nothing more than a basic human anatomy class, while others provide specific information about venereal disease, contraceptives, and human sexuality.

Opponents of sex education assert that it augments the probability of sexual activity among adolescents; however, supporters claim that sex education will promote more effective contraceptive practices among sexually-active teenagers. (Marsiglio and Mott, 1986). Zelnik and Kim (1982) have shown that exposure to a comprehensive sex education course may increase the likelihood that a teenager will engage in sexual intercourse at an earlier age, but that sexually active teen-

age girls who have had sex education are less apt to become pregnant. These results may be biased, however. Marsiglio and Mott (1986) revealed that a significant percentage of teenagers are having sexual intercourse before they are exposed to sex education.

For most teenagers living in the United States, the major source of information related to sexual practices is peer group members (Billy and Udry, 1987). Reliance on this source usually results in pervasive misinformation about the female menstrual cycle as well as erroneous ideas about contraceptive methods. It is not definitively known whether sex education has any significant impact on teenage contraceptive usage. Dawson (1986) reports that a majority of students who take sex education courses have more tolerant views toward the sexual behavior of others but little change in the values which influence their own sexual behavior.

The Swedish Approach to Sex Education. The Swedish approach to sex education is a comprehensive and diversified plan which appears to have been highly successful. The philosophy behind this plan distinguishes between fundamental values, which should be promoted in the curriculum, and more controversial issues, which are taught from a value-free perspective. Examples of the former are the rejection of sexual violence, respect for the individual's sexual rights, and tolerance for sexual diversity. More controversial issues, such as abortion, premarital sexual relations, and

contraceptive practices are presented from various perspectives, and specific positions are not endorsed by the schools (Brown, 1983).

The Swedish curriculum is founded on the notion that most 16 and 17-year-old females are sexually-active and thus should be exposed to information that helps them make well-informed decisions. A national policy insures that all Swedish teenagers are exposed to courses with the objectives. They include:

- Acquisition of a knowledge of anatomy, physiology, ethics, and social relations that will equip people to experience sexual life as a source of happiness and joy in fellowship with others and to strive for relationships characterized by responsibility, consideration, and concern.
- Acquisition of an objective and comprehensive introduction to different values and philosophies that have a bearing on sexual life.
- Development of the capacity to understand that sexuality is an integral part of a person's life and is indissolubly connected with the development of personality.
- Acquisition of a greater awareness, and thus the ability to make informed choices at different levels of maturity and sexual experience.

The Swedish philosophy acknowledges further that: teaching should be characterized by respect for different patterns of sexual behavior, insofar as they are based upon a willingness to show responsibility and consideration. By not taking sides on the issues of moral questions regarding human sexuality, and keeping channels of communication open for unbiased consideration of alternative views of human relationships, Sweden has been highly successful at reducing unwanted teenage pregnancies.

Influences of Friends and Relatives. Recent studies (Furstenberg, Morgan, Moore, and Peterson, 1987; Billy and Udry, 1988; Newcomer and Udry, 1987) have found that the effects of friends' and parents' attitudes, and parental marital status are key determinants of teenage sexual activity. Some researchers believe that parental attitudes are especially important in influencing levels of sexual activity among adolescents (Shah and Zelnik, 1981). Rosen (1986) asserts, however, that levels of teenage sexual activity are not affected by parental advice or attitudes. Instead, he argues that sexually-active teenage girls are influenced more by the attitudes of their peers toward sexual intercourse.

Racial Differences in levels of Sexual Activity. Kantner and Zelnik (1972) discovered that sexual activity is affected by race and family background. Their study found evidence that black women generally initiate sexual intercourse at younger ages than white women: 15.5 years for blacks and 16.2 years for whites. Furthermore, black unmarried teenage girls were found one and one half times as likely to be sexually active as are white teenage girls of the same age. Kantner, et al. (1972) also found that teenagers living in poverty are no more likely to be sexually experienced than are their affluent counterparts.

Among all teenagers who are sexually active, whites seem to engage in sexual intercourse more frequently than blacks and are more apt to have had several different partners

(Maryland, 1985). Although race seems to be a good predictor of age at first intercourse, it has not been determined why this is the case.

Adolescent Contraceptive Usage

Kantner and Zelnik (1973) have estimated that roughly five percent of all female adolescents who engage in sexual activity are doing so in an attempt to become pregnant. Considerably more than five percent, however, ultimately become pregnant and give birth.

Given that a teenager chooses to engage in sexual intercourse, a decision must be made about whether to use some form of contraception. The decision not to use contraceptives increases the probability of pregnancy; nevertheless, many teenagers who do not wish to become pregnant never seek contraception.

Several studies (Dryfoos, 1973; Gold and Benson, 1985; Kisker, 1984; Shah and Zelnik, 1981; Studer and Thornton, 1987) have addressed the issue of contraceptive usage by sexually active adolescents. Lack of contraceptive use by teenage females appears to be the result of three underlying factors: inadequate information about contraception, less than sufficient access to contraceptives, and a lack of reinforcement for consistent use of contraception. Research supports the view that for most teenagers, there is a lack of information about where to get contraceptives, how to get them, how to use them, and which methods are most efficacious

(Jones, et al., 1985).

Access to Family Planning Services. Family planning services include pregnancy testing and counseling, and the provision of contraceptive and abortion related services. The majority of sexually-active teenagers that practice some form of birth control usually obtain it from some type of publicly-funded family planning clinic. However, many months of sexual activity usually elapse before they make their first visit to a clinic (Akpom, Akpom, and Davis, 1976).

A major drawback of the U.S. family planning clinic system is that it was originally designed as a service for individuals living below the poverty line, and it is frequently avoided by adolescents who perceive these clinics to be a provider for welfare clients. Government-funded clinics usually charge little or no fee for their services, but sometimes will not guarantee confidentiality for teenage clients. Confidentiality is also a major concern for teenagers who fear that their parents may become aware that they are sexually active.

There is variation in state laws regarding confidentiality of clinic services provided to teenagers. As a result, many teenagers choose not to visit a clinic if they live in a jurisdiction which has restrictive age of consent (or parental notification) laws for contraceptive services. The U.S. system is considered to be reasonably accessible in a strictly geographic sense. There is a sense of stigma as well as

lack of trust, however, associated with visiting a publicly-funded family planning clinic.

A study by Chamie, et al., (1982), examined family planning clinics and community characteristics in selected U.S. counties by focusing on differences between counties in which high and low proportions of teenagers at risk of unintended pregnancy obtained birth control services in clinics. Their measures of teenage females in need of services and those actually served are based on The Guttmacher Institute's definition of need (Dryfoos, 1973).

The counties examined in the Chamie, et al., study were categorized as high-met-need (average of 75% of teenagers in need were served) and low-met-need (average of 28% of teenagers in need were served). Several important results were revealed by this study, including:

- Clinics in high-met-need areas appear to be more numerous, flexible, diverse, innovative, assertive, and visible than those in low-met-need areas.
- There are twice as many clinics per teenage females at risk of unwanted pregnancy in high-met-need counties than in low-met-need counties; the former clinics also provide more hours of service per week.
- Clinics in high-met-need counties are more likely to receive income from a variety of federal, state, and local government and private sources; clinics in low-met-need areas are more likely to be heavily dependent on federal funds.
- Health departments provide the majority of family planning services in low-met-need counties, but there is a much greater diversity of type of agencies in high-met-need counties.
- Clinics in high-met-need counties more often have special out-reach and follow-up programs involving teenagers, and are more apt to have specific activities to recruit ado-

lescents.

- Clinics in high-met-need areas more frequently provide services to minors without requiring parental consent or notification.

- State laws and policies more often encouraged teaching contraceptive education in the schools in high-met-need counties.

- Clinic personnel in high-met-need areas are more frequently invited by public schools to make presentations before students; the schools in these counties are also more apt to request information about birth control from family planning clinics.

- In high-met-need counties, policies are more likely to definitively explain the rights of minors to obtain contraception on their own consent; in low-met-need areas there is usually no policy spelling out those rights.

- Physicians in high-met-need areas are more likely to prescribe contraceptives for unmarried minors without parental consent than they are in low-met-need counties.

- Physicians' fees for contraceptives are lower in high-met-need counties than in low-met-need areas.

Based on those findings, Chamie, et al., conclude that more open and active family planning clinics in high-met-need areas are supported by more liberal laws and policies regarding minors' rights to access to family planning services. Furthermore, there is strong encouragement and support of birth control instruction in the schools in high-met-need counties. As a result, the incidence of unwanted teenage pregnancies and births is much lower in many high-met-need counties than in low-met-need counties.

Other studies support the findings of the Chamie, et al. study (Zabin and Clark, 1983; Zabin and Clark, 1981; Zelnik and Kantner, 1979). Those studies show that most sexually-active teenagers in need of family planning services who are

not served by such clinics perceive them to be cost-prohibitive, too far away from home, and/or lacking client confidentiality.

Some sexually-active teenagers rely on private providers (profit or nonprofit) of family planning services. Many other sexually-active teenagers, however, perceive private providers as an inaccessible source of birth control. Physicians in private practice usually charge substantial fees for their services and often will not guarantee client confidentiality for teenage patients who seek family planning services. Many teenage girls cannot afford to purchase contraceptives from physicians in private practice. Other teenagers are apprehensive about their parents being informed that they are sexually active. As a result, many teenage girls choose not to obtain family planning services from physicians in private practice.

In many locations privately-funded nonprofit organizations serve sexually active teenagers' needs for contraceptives. These organizations typically do not charge fees for their services. However, policies related to client confidentiality vary from strict confidentiality in some organizations to consistent parental notification in others.

Desirability of Using Contraceptives. Access to contraceptive services does not necessarily reduce the likelihood that a teenager will become pregnant. The typical adolescent sexual encounter is characterized by a large element of

chance opportunity. Several studies (Goldsmith, Gabrielson, Gabrielson, Mathews and Potts, 1972; Zabin and Clark, 1983; Zelnik and Kantner, 1979) conclude that many teenagers do not use contraceptives regularly either because they did not expect to have sexual intercourse or because they believed it was wrong to be prepared for a sexual encounter in advance. As a result, many sexually active teenagers rarely or never use birth control and ultimately become pregnant. Kristin Moore (1980, p. 109) explains that: "The difficulty of simultaneously managing the initiation of a sexual relationship and negotiating the rules of birth control use seems to overtax the capacity of many younger adolescents. Many teens wishing to maintain at least the facade of spontaneity, may fear that any act of preparation would brand them as having planned to have sex." But a spontaneous encounter that is not premeditated may be perceived as perfectly acceptable, even if no contraceptive is readily available. Impulsive behavior combined with a sense of immorality associated with planning for a sexual encounter may explain why some teenagers do not use some form of birth control consistently.

In some cases teenage girls are able to attain contraceptives on a regular basis, but do not always use them in a consistent manner because they are not positively reinforced by providers, parents, peers, and/or male partners. A lack of open and frequent communication between a teenage girl and her sexual partner is related to lower frequency of contraceptive usage. It appears that teenage sex partners who op-

enly communicate about their fertility goals are much likely to use contraceptives consistently than those teenagers who do not (Kisker, 1984).

Adolescent Pregnancy Resolution

Teenagers who become pregnant are faced with a decision of whether to have an abortion or carry the pregnancy to term. Several studies have been conducted to determine the variables which significantly influence an adolescent's decision regarding the resolution of a pregnancy. Previous studies have focused on economic and psychological variables which appear to be relevant in the resolution decision. In a survey article, Lucy Olson (1980) determined that adolescent women who terminate a pregnancy are distinctly different from their full-term counterparts. Her study reports that there are differences between the two groups with respect to age, race, education, sources of financial support, religion, attitudes, and socioeconomic background. Olson's study reached the following conclusions with respect to the pregnancy resolution decision:

- White teens are much more likely to abort a child than are black teenagers.
- Unmarried teenagers are most likely to seek abortions during their very early or late teens. But, the average age of an adolescent who gets an abortion is older than that of the average age of a term patient.
- Abortion patients are more likely to come from intact families and have fewer siblings
- Abortion patients tend to be more financially independent of their families than term patients.

- Poor grades and academic problems are usually present before a teenage mother becomes pregnant. Term patients usually earn lower grades than abortion patients.
- Aborters are less likely to have moral or religious objections to abortion.
- Teenagers who have abortions tend to have greater knowledge of role models who have had abortions, and teens who become mothers have had more experience with single parenthood role models in their families.

In summary, the adolescent who has an abortion tends to be more financially independent, more academically motivated, and have higher career aspirations than the typical teen who becomes a mother.

Other studies confirm some of the findings of the Olson survey article. A study by Rosen (1980) which looked at the impact of parents on adolescent decision-making found that few teenagers told their parents when they first thought that they might be pregnant. But, over half did consult their mothers in deciding the resolution of the pregnancy. The single most important person among white adolescents who decided to keep their children, however, was their male partner. It is believed by Rosen that, because few adolescents involve their parents until they think they are pregnant, the parents may not have been aware of their daughters' sexual activity.

More recently, a study by Eisen, Zellman, Leibowitz, Chow, and Evans (1983) examined psychological, background, and economic variables affecting an adolescent's decision about whether to abort or not. Their study found that the typical teenager who chose abortion was generally character-

ized by the following:

- 18-19 years old
- white
- financially independent
- high level of academic achievement,

It was also determined that teenagers who chose to carry their pregnancies to term were more likely to be Mexican-American and Catholic, to be receiving public aid in the form of AFDC and/or Medicaid, to be high school dropouts, to have lower grades in high school, and to be supported financially by their parents. Additionally, the pregnancy resolution was found to be influenced by the girl's boyfriend, best girlfriend, and mother, but not her father.

The Eisen, et al. study is one of few to look at factors affecting the teen's decision to marry given that she does carry the baby to term. It was found that the only discriminating variable affecting this decision was receipt of state aid. Teenagers whose families received AFDC and/or Medicaid for delivery of the child were more inclined to remain single than to marry.

A similar study by Leibowitz, Eisen and Chow (1986) used the following independent variables in explaining an adolescent's pregnancy resolution decision: (1) a proxy for a teenager's value of time (i.e., high school grade point average), (2) public- and self-support variables (i.e., AFDC and Medicaid, family income, and teen's income), and (3) ethnicity. They found that a teenager was more likely to have an abortion if she had a relatively high value of time (i.e. high

grade point average) was financially independent of her family, and was not of Mexican-American or Hispanic Catholic descent.

It has been asserted that public assistance in the form of AFDC, food stamps, and Medicaid acts as an economic incentive to out-of-wedlock childbearing among adolescents. A study by Janowitz (1976) examined the impact of AFDC on illegitimate birth rates of women of all ages. She concluded that the welfare system has a substantial positive impact on illegitimate birth rates of young women, 15-24 years of age. Contrary to this finding, other studies have shown that neither the level of AFDC benefits nor the AFDC acceptance rate in a given area acts as an economic stimulus to adolescent childbearing (Moore and Caldwell, 1977; Moore, 1978). Moore (1978) also found that the presence of subsidized family planning clinics does lower fertility rates, particularly for black teenagers, and that the availability of abortion tends to reduce the incidence of childbearing among single white teens.

The Issue of Pregnancy: Further Considerations

It has been determined that younger teenagers delay longer than older adolescents in seeking medical advice (Hatcher, 1976). Furthermore, younger adolescents are likely to have less experience in obtaining professional assistance related to pregnancy than are older teenagers. Thus, for many younger teenagers, months pass between the time of conception

and the time a decision is made about pregnancy resolution.

Even the best informed teenagers may have difficulty in acknowledging their pregnancies. The emotional aspects associated with being pregnant can be very burdensome for some adolescents, particularly younger ones. Thus, many teenagers who are aware that they may be pregnant will go through a period of pregnancy denial. For many adolescents, denial of pregnancy, uncertainty about to whom to turn, and fear of telling parents are key factors in their delay in making a decision regarding pregnancy resolution.

Individuals who are facing a decision about whether or not to have an abortion can have pronounced psychological complications. The decision to abort is a highly ethical and moral dilemma for most women. Thus, many teenagers of all ages with unwanted pregnancies delay seeking an abortion. In many cases, the delay is so long that it is too late to legally obtain an abortion. Abortion is usually illegal for pregnancies which have entered the third trimester. Some teenagers will illegally seek out abortion after a six-month delay; many others will not. As a result, many teenagers become mothers unintentionally.

Stages of Fertility Decision-Making

According to Hass (1974), fertility decision-making must be understood as a process, a situational variable, subject to various influences at different times. If fertility is to be explained, it is important to incorporate the impact of

demographic, economic, sociological and psychological variables on an individual's decision-making process. The impact of these variables will vary across individuals resulting in variation in fertility decisions.

The model constructed by Hass acknowledges the fact that adolescent fertility decision-making is affected by a comprehensive and complicated set of factors. The essence of Hass' model is that there are stages of fertility decision making: (1) the preconception stage, (2) the pregnancy resolution stage, and (3) the postnatal stage. Hass argues that it is the perception of the consequences of childbearing and the values associated with these consequences which affect fertility goals, actions taken to implement these goals, and the ultimate result of these actions.

According to Hass, the principal factors which affect fertility decision-making are:

- individuals' level of knowledge concerning biological factors that influence the probability of conceiving a child (i.e., menstrual cycle, age at menarche),
- individuals' level of information about the availability of and accessibility to various birth control measures (i.e., contraception, abortion, etc),
- individuals' attitudes towards conceiving children, as well their attitudes toward using various forms of contraception,
- individuals' attitudes toward childrearing, adoption, etc.
- individuals' perceived consequences (i.e. costs) of childbearing and childrearing in terms of cultural, financial, and situational factors, and the
- degree of communication between sexual partners.

Hass emphasizes the following points. First, if sex-

ually active individuals are not aware that they have birth planning control alternatives available to them, they will not be able to decide to influence the probability of pregnancy and childbearing. In this case the probability of pregnancy will be a function of biological factors only. Second, an individual's attitude toward birth control is a precondition for decisions about fertility planning. If all known birth control options are unacceptable, fertility will not be subject to manipulation. Third, greater knowledge and availability of birth planning control, will facilitate more efficient decision-making by an individual (or couple). Individuals who are more favored in this respect will be more careful in formulating their fertility goals, and will implement a more effective action to insure that the desired fertility outcome will occur.

The action an individual undertakes to achieve the desired fertility result will depend partly on her ability to communicate and concur with her sex partner on the desired outcome. The efficacy of the action undertaken will depend on the availability of and accessibility to the resources required (e.g., contraceptives, abortion, medical care) to achieve the desired fertility outcome. This in turn will have an impact on the fertility outcome (i.e., the probability of pregnancy and birth).

Dialogue between sex partners will be a key factor affecting the fertility outcome. High levels of communication between sexual partners is likely to result from sharing rel-

evant information which may affect perceived costs and/or benefits of different alternatives. This in turn will allow for a "better-informed" fertility decision.

If a couple have good rapport regarding matters of birth control and fertility planning, they will be more apt to make unanimous decisions on their fertility goals and how to carry them out. Unification of a couple's fertility goals will enhance the likelihood that their decisions will be effectively implemented (i.e., that their desired fertility outcome is achieved).

The crux of Hass' model is that it facilitates the consolidation of concepts from various social sciences, including economics, into a theory of adolescent fertility behavior. The theoretical orientation provides a broad framework for determining the expected relationships between adolescent childbearing and its many explanatory factors.

CHAPTER III

THEORETICAL ORIENTATION

Adolescent childbearing is a phenomenon which cannot be wholly explained in terms of any one social science. It is better explained and understood using an interdisciplinary approach. Such an approach will afford a more complete and stronger theoretical foundation for analyzing the issues associated with adolescent childbearing. In this chapter theoretical relationships between the probability of teenage childbearing and its determinants are explained.

A Theory of Teenage Fertility

The occurrence of a teenage birth is not entirely predictable. There seems to be an inescapable element of chance which no current fertility theory can explain. However, numerous studies (from chapter II) have shown that it is possible to predict the effect of many factors on the probability that a teenage birth will occur.

Theoretically, it is expected that the individual teenage female will attempt to maximize net benefits when making fertility decisions. Her optimum fertility decision will be the one in which total net benefits (i.e. benefits-costs) are maximized subject to existing information, attitudes, re-

sources and opportunities. Certain decision alternatives will be unacceptable because they are perceived as wrong or immoral.

The benefits associated with fertility decision-making are a function of the utility derived from participation as a sex partner and as a mother. It is a difficult task to ascertain and measure these benefits. Insofar as individual tastes and preferences condition utility, it is likely that attitudes toward sexual activity, childbearing and childrearing will be important determinants of benefits. Sexual intercourse, per se, provides utility to the participants, as does childbearing and childrearing. Unfortunately, there is no way of measuring this type of benefit. However, there is no reason to believe that it varies in a systematic fashion across teenage girls.

Adolescents who wish to give birth early in life will have clearly defined fertility objectives. However, the unintentional nature of most teenage pregnancies and births suggests that most sexually active teenagers do not accurately assess the costs associated with fertility decisions (i.e. sexual intercourse, pregnancy, and childbirth). These costs include psychic costs, and explicit and implicit expenses incurred as a result of fertility decision-making.

The probability that a teenage birth will occur is determined by the complex interaction of individual fecundity, attitudes, information, resources, and opportunities.

Fecundity, the biological readiness for sexual activity,

conception, and childbirth, will vary across teenage females. The actions of teenage girls in terms of sexual activity, contraception, abortion, and childbirth are affected by their attitudes toward these events. Individual attitudes are shaped partially by the influences of parents, peers, sex partners, religious beliefs, and cultural sanctions from members of their ethnic community.

Availability of relevant information about biological determinants of childbirth, contraceptive availability and usage, abortion alternatives, and the social and economic consequences of childbearing and early parenting will also affect a teenage girl's fertility actions.

Individuals' fertility actions are constrained by resources available for family planning services, childbirth, and childrearing. Resources may be provided by teenage girls, or they may be furnished by their families and/or public assistance.

Economic opportunities will condition teenage girls' fertility decisions by affecting the opportunity costs associated with these decisions. Opportunities will be partly determined by employment and educational prospects.

Each of the aforementioned general determinants of the probability of a teenage birth can be represented by specific independent variables. The principal independent variables employed in this study are listed in Table I. This list is restricted to variables for which data can be obtained for statistical analysis. Although the list does not include all

relevant determinants, it does include a comprehensive mixture of variables from various social sciences. The nature and impact of these variables is discussed in the pages that follow.

TABLE I

DETERMINANTS OF TEENAGE FERTILITY

teenager's age
teenager's marital status
teenager's mother's age at first marriage
years of education completed by teenager's mother
religious attitudes toward family planning
minority status
female labor force participation rate
physician-provided family planning services
government-funded family planning services
abortion services
public assistance income received
school enrollment status
years of school completed
per capita income in area of residence
unemployment rate in area of residence
poverty status

Teenager's Age

The primary biological determinant of fertility is fecundity. Fecundity occurs soon after puberty and rises with age through the teenage years. Although fecundity cannot be observed, age is an appropriate proxy for it. Age represents more than fecundity, however; it also reflects greater opportunities for sexual relations, greater knowledge about family planning, more opportunities for employment, etc. If only fecundity increased with age, there would probably be a positive relationship between age and teenage births. It is possible that other correlates of age may offset the effect of age on fecundity. It cannot be concluded, a priori, what will be the effect of age on the probability of a teen birth.

The Impact of Attitudes

A teenager's attitude towards sexual behavior will be influenced to a large degree by what she perceives to be acceptable and appropriate actions on her part. This attitude will affect her choices regarding intercourse, contraception, and pregnancy resolution. An individual's attitude typically will be a function of many different variables. Most cannot be measured directly. Therefore, the following proxies are employed.

Teenager's Marital Status. The influence of a female's sexual partner on her fertility decision-making will depend primarily on the nature of their relationship. Teenage fe-

males who are married are likely to be significantly affected by the attitudes of their husbands. However, teenage girls who are unwed will be influenced by their sexual partners to a lesser degree. If the sexual relationship between the teenagers is casual and/or in an early stage, it is expected that the impact of the male partner on the female's decisions will not be significant. But, if teenage sexual partners have advanced to a stable, committed and long-lasting sexual relationship, the impact of the male on the female's decisions is expected to be significant. Teenager's marital status is used as a partial proxy for the influence of her sexual partner on the probability of her becoming pregnant. The frequency of sexual intercourse among married teenage girls is likely to be greater than that of unmarried teenagers. However, teenage couples who marry will be much more likely to communicate and plan their decisions regarding childbearing. Thus, the effect of teenage marital status on adolescent childbearing is not known, a priori.

Teenager's Mother's Age at First Marriage. The age at which a teenager's parents first became parents may be suggestive of their views about early motherhood. The attitude of those parents who bore their children as teenagers is expected to be one of greater tolerance for early childbearing than for those parents who had their children later in life. Thus, the general attitude of girls of teenage parents will be one of greater acceptance of early motherhood. Therefore,

these girls are expected to have a greater probability of bearing children as adolescents than teenage girls of nonteenage parents. In this study, the age at which the teen's mother first married is used as a proxy for the age at which her parents became parents.

Years of Education Completed by Teenager's Mother. Studies have shown that women who are better-educated have greater knowledge of human reproduction, sexuality, and pregnancuy prevention, and more favorable attitudes toward birth control and abortion (Goldsmith, et al., 1983). Thus, there is expected to be a negative relationship between the teen's mother's level of education and the probability that the girl will give birth as a teenager.

Religious Attitudes Toward Family Planning. The church is an active and prominent player in promulgating and monitoring adherence to acceptable sexual behavior. The influence of religious affiliation, defined as membership in a specific church denomination, and religiosity, defined as the frequency with which a person attends a religious service, may be important in explaining variations in sexual activity and contraceptive usage among teenagers. Ruppel (1970) argues that religious affiliation does not affect levels of sexual activity and contraceptive usage among teenage females. He asserts, rather, that it is differences in degrees of religiosity across teenage girls which affect those levels.

Many teenagers who regularly attend religious services tend to develop a "psychological allegiance to a church group as a referent" (Billy and Udry, 1987). This affiliation with a religious referent group provides a teenager with role models and, in most instances, a sanctioning system which discourages sexual activity. Therefore, these groups do not offer assistance with, or condone, the use of contraceptives.

Most religious groups in the United States have traditionally taken a stance against premarital sexual intercourse. Many teenagers who attend church regularly are sexually active, however, if only on an infrequent basis (Studer and Thornton, 1987). The typical adolescent sexual encounter is one of spontaneity in which contraception is rarely practiced. This is especially true for younger teenagers (i.e. 15-17 years old).

Many methods of birth control are designed for female use exclusively. Furthermore, effective use of these methods usually requires that females be prepared for intercourse in advance of a sexual encounter. Contraceptive preparedness for many religious teenage girls tends to confirm the reality that they are sexually active and therefore conflicts with church teachings. Many religious teenagers may deem it inappropriate to plan for a sexual rendezvous by securing some form of birth control technology. But a spontaneous encounter that is not premeditated may be perceived as more acceptable. Thus, many religious teenage females do not use con-

traceptives.

The spontaneous nature of the typical adolescent sexual encounter, the attitudes of many religious teenagers regarding premeditated sexual intercourse via contraceptive procurement, and the unacceptability of contraceptives by most church denominations tend to diminish the use of birth control among many religious teenagers.

Higher degrees of religiosity are associated with diminished frequency of sexual intercourse and contraceptive usage among teenage females. However, it does not appear that higher degrees of religiosity reduce the number of teenage sexual encounters that are the result of an impulsive or spontaneous rendezvous. Thus, a higher degree of religiosity is expected to reduce levels of teenage sexual activity. However, it tends to reduce the likelihood that teenagers who are sexually active will use contraceptives.

The effect of relgiosity is represented in this study by an index of religious attitudes toward family planning. The construction of this index is explained fully in chapter IV. There is expected a negative relationship between the religious favorability index and the probability of an adolescent birth.

Minority Status. Some researchers (Zelnik, Kantner and Ford, 1987; Furstenburg and Moore, 1983) have found that rates of sexual activity are higher in disadvantaged populations where the opportunity for social and economic advance-

ment is so low that the opportunity costs of early parenthood are minimal. Based on differences in social and economic circumstances across racial minorities, these researchers believe that comparable socioeconomic conditions would greatly reduce differences in rates of adolescent sexual activity and childbearing between racial minorities and whites.

Recently, however, Furstenberg, et al. 1987) have con-concluded that higher rates of adolescent sexual activity among blacks may reflect a different set of cultural norms. Blacks tend to have a more tolerant attitude toward early childbearing, which seems to diminish the deterrence to adolescent sexual activity.

These studies suggest that, within minority populations, it is not necessarily the current social and economic conditions, per se, that cause childbearing at relatively early ages. Rather, it is possible that the value systems of these groups causes a higher incidence of adolescent childbearing.

Given these cultural differences in attitudes toward early parenthood, it is expected that the typical nonwhite teenager will be more likely to bear a child than the typical white teenager. These studies, however, do not acknowledge the fact that racial minorities, (particularly blacks) have endured severe social and economic adversity for many decades and that this adversity has likely affected their preferences for children at earlier ages.

Female Labor Force Participation Rate. Attitudes may be influenced also by the norms, or expectations, of the broader community in which a girl lives. It is difficult to develop a measure of this influence. In this study, we will use the female labor force participation rate in region of residence as a proxy for regional attitudes. A high rate is assumed to be indicative of a general expectation that females will establish careers before becoming mothers. Thus, a negative relationship is expected between the female labor force participation rate and the probability of a teenage birth.

Accessiblity to Physician-Provided Family Planning Services

The accessibility to contraceptives should be a key determinant of teenage pregnancy. Easy access to family planning services is expected to make contraceptives and general birth control information more readily available. An individual's accessibility to family planning services will be a function of the proximity of providers to her place of residence, provider's policies related to client confidentiality, charges for services, and hours of operation. Many teenage girls do not obtain contraceptives from private physicians because of the high cost of obtaining them from this source (Chamie, et al., 1982; Zabin and Clark, 1983). Furthermore, many private physicians inform the parents of teenage girls when the girls request family planning services. As a result, many teenagers resort to using a non-profit or public clinic. Many others decide to engage in

sexual intercourse without using any form of contraception (Zabin and Clark, 1983).

Some teens will nevertheless obtain contraceptives from private sources. The greater the number of private physicians who are providers of family planning services per female teenager in a given area, the more likely teenagers will be to obtain family planning services from that source, and the lower the expected probability of adolescent childbearing.

In many locations nonprofit organizations provide family planning services to teenagers. Nonprofit organizations include churches and other private entities (such as Planned Parenthood) that do not operate on a profit motivated basis. These organizations often do not charge fees for their services. However, their policies related to client confidentiality vary from strict confidentiality to required parental consent. Teenagers' willingness to obtain family planning services from nonprofit organizations will largely depend on policies related to client confidentiality. Still, it is expected that the probability of adolescent childbearing in a given area will be inversely related to the number of private nonprofit sources providing services in that area. Unfortunately, reliable data on these services for 1979 could not be obtained.

Accessiblity to Government-Funded Family Planning Services

Most states are served by an extensive system of public clinics that provide family planning services. A major drawback of the U.S. family planning clinic system is that it was originally designed as a service for the poor. Many adolescents avoid using these clinics because they perceive them as a provider for welfare clients. Thus, the stigma associated with using a publicly-funded clinic reduces their accessibility for many teenage girls.

The accessibility of publicly funded clinics in a given area will also depend on specific location, prices of services, confidentiality, and hours of operation (Zabin and Clark, 1983). It is expected that sexually active teenagers will be more likely to obtain contraceptives from a public clinic which is located close to their place of residence, charges little or no fee for services, and has a policy of strict confidentiality. Greater accessibility in terms of these dimensions will diminish the probability of a girl becoming pregnant and bearing a child.

Accessiblity to Abortion Services

Many teenagers will not visit a family planning clinic until they believe that they are pregnant. The option of abortion then becomes a viable alternative for many pregnant teenagers who do not yet wish to become parents.

Public policy toward abortion availability will be a key

factor in determining whether family planning clinics offer abortions to teenagers. Physicians in private practice and private abortion clinics perform most abortions. Abortion availability depends on proximity, price and client confidentiality. It is expected that sexually active teenagers living in areas where abortions are more available will have a lower probability of becoming a teenage mother.

Public Assistance Income Received

The overwhelming majority of teenagers (97 percent) who carry a pregnancy to full term keep their babies rather than placing them for adoption or in foster care (Moore, 1977). Thus, most adolescent mothers face substantial costs for childbirth and childrearing.

Teenagers who rely exclusively on their own income for financial support are likely to face job interruptions from giving birth and rearing a child. As a result, their levels of own-income will fall. Those teenagers who partially depend on friends, relatives or sexual partners for financial support, will not realize as large a reduction in income as a result of giving birth.

Teenagers with higher levels of financial independence will incur a greater opportunity cost from childbearing and childrearing than will teenagers who rely on sources other than own-income. Thus, it is expected that there will be an inverse relationship between an adolescent's degree of financial independence and her probability of childbearing.

Certain government programs provide financial assistance to low-income families with dependent children. Some of those programs are Aid to Families with Dependent Children (AFDC), food stamps, and Medicaid. These programs have the effect of reducing the explicit costs of childbearing and childrearing to recipients.

Teenagers who are pregnant, have at least one child, and receive public support, may be eligible for higher levels of government assistance as a result of a second birth. Individual circumstances will determine what increase, if any, a second birth has on public support payments. It is expected that higher levels of public support payments will be positively related to the probability of adolescent childbearing.

Many sexually active teenage girls live with their parents all of their adolescent years. If these teenagers become pregnant, the level of public support received by their parents may influence their decision regarding pregnancy resolution. The addition of a child to a family on welfare will probably increase their public support payment. This effectively reduces the cost of raising the additional family member. Thus, a greater economic incentive to bear children exists for pregnant teenagers who live with families who are currently receiving public support.

Although public assistance has the effect of reducing the cost of childbearing, previous researchers have found evidence which suggests that it does not act an incentive for a teenager to purposefully become pregnant and then bear a

child (Moore, 1978; Moore and Caldwell, 1979; Moore, 1980). Public assistance does appear to induce teen mothers to establish independent households, however.

Opportunity Costs of Teenage Childbirth and Childrearing

While the costs of childbirth are primarily explicit in nature, the costs of childrearing are both explicit and implicit. The explicit costs of childrearing are largely independent of the age at which a woman resolves a pregnancy. The implicit costs take the form of foregone education, income, and career opportunities as a result of time devoted to parenting. Many women complete their educational goals and establish careers before bearing children. For these women, the implicit costs of childrearing are greatly reduced. However, most adolescents become pregnant unintentionally. Many teenagers who become mothers fail to complete their educational and career goals and therefore incur substantial opportunity costs. The following proxies are employed for those costs.

School Enrollment Status. It is expected that a teenager who is enrolled in high school at the time her pregnancy is discovered will incur a greater opportunity cost if she gives birth than a pregnant teenager who is not enrolled in school. An enrollee is likely to place a positive value on the consumption benefits of school derived from activities, friendships, etc. There will be no such benefits for the

drop-out. This makes it more likely that the current enrollee will have a lower likelihood of bearing a child than a teenager who is not enrolled in school.

Years of School Completed. Higher levels of education represent an investment in human capital. Human capital is the bundle of skills and abilities an individual carries into the labor market. The more human capital an individual has, the greater will be her marginal productivity. This in turn increases her prospects for attaining employment at a relatively high wage or salary. Individuals with little human capital are less productive and are less likely to gain employment at relatively high wages.

The largest single cost of parenting is the time devoted to raising a child. The opportunity cost of parent's time devoted to childrearing will depend primarily on the opportunity wage of the parents. Teenagers with relatively high levels of education will incur relatively high opportunity costs in the form of foregone income as a result of childrearing. Thus it is expected that there will be an inverse relationship between a teenager's level of education (i.e. number of years of school completed) and the likelihood that she will be an adolescent mother.

Per Capita Income in Area of Residence. General economic conditions in a teenager's place of residence will partially determine the expected opportunity cost of childrearing. Annual per capita income is commonly used as a

measure of a region's prosperity. High levels of per capita income indicate prosperous economic conditions, and therefore good employment opportunities with relatively high earnings.

If per capita income is relatively high, an individual will incur higher opportunity costs in the form of foregone employment prospects as a result of childbearing and child-rearing. It is expected that the higher the annual level of per capita income in a teenager's area of residence, the lower will be the probability of a birth.

Unemployment Rate in Area of Residence. The unemployment rate is another indicator of general economic conditions. There is an inverse relationship between the unemployment rate and the probability of gaining employment. As discussed earlier, the higher the probability of attaining employment, the higher will be the opportunity cost of childbearing.

Unemployment rates vary widely across location. Thus, opportunity costs in the form of potential employment prospects will vary across location as well. Teenagers who chose to have children and not work will incur these costs in the form of foregone employment opportunities. It is expected that the probability of adolescent childbearing will be higher in locations where the unemployment rate is relatively high.

Teenager's Poverty Status. The economic well-being of a teenager, as measured by her poverty status, may be an indi-

cator of her hopes of achieving a higher standard of living in future years. Teenage girls who live in households (as children or spouses) which are below the "official poverty line" may perceive their chances of improving their standard of living as very low.

Although prospects for improving their economic well-being may be grim, teenage girls living in poverty may believe that they can enhance their lives by becoming mothers. Thus, in an attempt to fill a "void", many teenage girls living below the poverty line may substitute the experience of teenage motherhood for the (perceived unlikely) chance of improving their standard of living (Greg, 1984). It is expected that there will be an inverse relationship between a girl's poverty status and the probability of adolescent childbearing.

Concluding Remarks

In brief, this chapter has focused on the consolidation of concepts from various social sciences into a theory of adolescent fertility behavior which includes economic variables. There are limits to how much behavior can be explained by this effort. The theoretical orientation provides a basis for determining the expected relationships between adolescent childbearing and the explanatory factors that have been established. Most of these hypothesized relationships will be tested statistically to determine if they are supported by empirical evidence.

CHAPTER IV

THE EMPIRICAL MODEL

Overview of the Model

The theoretical orientation to adolescent fertility decision-making (Chapter III) is an exposition of a fairly complete set of explanatory variables. Because of limited data availability, the statistical model for adolescent fertility decision-making will not be identical to that of the theoretical model, but it will be a reasonable approximation of it.

In addition to the explanatory variables listed in Chapter III, the impact of regional variation of these variables on adolescent childbearing will be identified for separate regions within Oklahoma.

Definition of Terms

The following terms is needed to understand the independent variables. They are defined as follows:

abortion: the intentional termination of a pregnancy.

contraceptive: any of several methods to prevent the conception of a fetus including birth control pills, diaphragms, and vaginal spermicides.

county group: an area with a population of 100,000 or more inhabitants, generally a group of contiguous counties.

family planning: voluntary planning and action by individuals to have the number of children they want, when they want them.

family planning agency: an administrative mechanism to provide family planning services.

family planning clinic: a place or facility at which an agency provides family planning services. It may be a hospital, health center, a mobile unit, a free standing site, church or storefront. Physicians' offices are considered as clinic locations only when there is a formal relationship with an agency.

family planning services: provide the means which enable individuals to meet their family planning objectives. These services are medical, social, financial, and educational.

fertility: The official U.S. Bureau of the Census definition, the number of children ever born to a woman during her lifetime.

fertility rate: the number of children born in a given year per 1,000 women aged 15-44 years old.

own-wage income: total money earnings received for work performed as an employee at any time during the calendar year 1979.

public assistance income: cash receipts of payments made under Aid to Families with Dependent Children (AFDC) and/or cash receipts of payments made under Supplemental Security Income during the calendar year 1979.

religiosity: the frequency with which an individual attends some type of religious service, usually measured in terms of regularity of church attendance (i.e. number of times per year attending church).

sex education: any formal method of informing individuals about human anatomy, human sexuality, venereal disease, contraceptive usage, human relationships pregnancy symptoms, and/or sexual intercourse.

The Formal Model

The fertility decision-making model is designed to estimate the impact of various independent variables on the prob-

ability that a birth will occur. The model is estimated using logit analysis. The dependent variable is the logarithm of the odds that a particular choice will be made. In this case, the choices are "give birth" versus "do not give birth", during the adolescent years. Specifically, the dependent variable is the logarithm of the odds that an individual will give birth. The adolescent childbearing choice can be formalized by estimating the equation:

$$\begin{aligned} BIRTH = a0 &+ b1AGE + b2MAR + b3AGEMAR + B4FGRADE \quad (1) \\ &+ b5REL + b6MIN + b7LFPR + b8PPF + b9FPS \\ &b10ABORT + B11FINCT + b12SCHOOL + b13GRADE \\ &B14PCI + B15UNEMP\ b16POV + b17RA + b18RB \\ &+ \ldots\ldots\ldots + b22RF + U \end{aligned}$$

Where:

BIRTH = the childbearing status of a teenager in 1979; borne a child = 1, never borne a child = 0.

AGE = age of the teenager.

MAR = marital status of the teenager in 1979; married= 1, not married = 0.

* AGEMAR = the age at which a teenager's mother first wed.

* FGRADE = the highest grade level of education completed by a teenager's mother.

* REL = religious favorability index toward family planning services in a teenager's region of residence for the year 1980.

MIN = minority status of teenager; white = 0, non-white = 1.

LFPR = the female labor force participation rate in a teenager's region of residence in 1979.

* PPF = physicians per female aged 15-19 years in a teenager's region of residence who were expected to be providing family planning services in 1979.

* FPS = an index of the availability of government funded family planning services in a teenager's region of residence in 1979.

* ABORT = an index of the availability of abortion services in a teenager's region of residence in 1979; abortion facilities present = 0, abortion facilities not present = 1.

* FINCT = total amount of public assistance income which a teenager was expected to have received in 1979.

SCHOOL = school enrollment status of a teenager in 1979; enrolled in school = 0, not enrolled in school = 1

GRADE = highest grade level of education completed by a teenager as of 1979.

PCI = per capita income in a teenager's region of residence for the year 1979.

UNEMP = the average unemployment rate in a teenager's region of residence for the year 1979.

* POV = poverty status of a teenager's household; percent of official poverty line.

* R = the region of residence in which a teenager lived in 1979.

U = error term

a = constant term

b1.....b22 are coefficients for the explanatory variables.

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* For further discussion of these variables refer to pages 65-75.

Expected Signs of the Explanatory Variables

The expected relationships between the probability of adolescent childbearing and the explanatory variables are listed in Table II below. The expectations of the direction of the impact of the explanatory variables is based on the discussion in Chapter III.

TABLE II

DIRECTION OF IMPACT OF THE EXPLANATORY VARIABLES

Variable	Expected Sign of b
AGE	?
MAR	?
AGEMAR	-
FGRADE	-
REL	-
MIN	+
LFPR	-
PPF	-
FPS	-
ABORT	-
FINCT	+
SCHOOL	-
GRADE	-
PCI	-

TABLE II CONTINUED

UNEMP	+
POV	-
R	?

The Sample

Methods of Data Collection

Secondary Sources: The data for this study were collected from a variety of sources. The 1980 Census of Population and Housing for the state of Oklahoma provides information on various demographic, social, and economic characteristics of the subjects in the sample. The sample is a subsample of the households that received census long-form questionnaires in 1980. This sample, designated as the "A" sample, is a 5 percent sample that includes over one fourth of the households that received the census long-form questionnaire. This sample is self weighted (i.e. stratified) so that the frequency of a particular characteristic for the entire population can be estimated. It is very important to note that with regard to the percent of teenage births to unwed mothers the census sample for Oklahoma is highly representative of the national average of teenage births to unwed teenage mothers. Information obtained for the 1980 census

was collected in 1979.

Other secondary sources used include The City and County Data Books (1983, 1986) also published by the Bureau of the Census. The Oklahoma Medical Research Foundation (1987) supplied information used to estimate family planning services provided by physicians in private practice.

Primary Sources: In order to gather information on family planning services and sex education in the schools, data were collected through the use of two separate survey questionnaires. The attempt to gather information regarding the content and nature of curricula used for sex education in Oklahoma school districts in 1979 was unsuccessful. Better information was obtained for 1988; however, it would be inappropriate to use that information to estimate equation 1.

An attempt was made to obtain information related to the availability and accessibility of family planning services throughout Oklahoma for the year 1979 via a questionnaire which was sent to the various social service agencies across the state. This effort also failed to provide enough useful data for 1979

Sample Characteristics

The tables on the following pages represent the demographic composition of the subjects in the sample.

TABLE III

SAMPLE CHARACTERISTICS OF TEENAGERS LIVING IN OKLAHOMA DURING 1979

	Frequency	Percent
Age		
15	238	19
16	241	19
17	227	18
18	242	19
19	314	25
Total	1262	100
Race		
White	1096	87
Black	68	5
Indian	90	7
Other	8	1
Total	1262	100
Marital Status		
Single	849	67
Married	399	32
Separated or Divorced	13	1
Widowed	1	< 1%
Total	1262	100

TABLE III CONTINUED

Education		
7th Grade or below	10	< 1%
8th & 9th Grade	186	15
10th Grade	286	23
11th Grade	258	20
12th Grade	411	33
1st yr. College	76	6
2nd yr. College	35	3
Total	1262	100
Poverty Status		
percent of poverty line:		
less than 75	153	12
75 to 99	84	7
100 to 124	75	6
125 to 149	81	6
150 to 174	83	7
175 to 199	65	5
200 or more	721	57
Total	1262	100
Fertility Status		
number of children:		
none	1047	83
one	181	14
two	30	2
three	3	< 1%
four or more	1	≤ 1%
Total	1262	100

Source: Bureau of the Census of Population and Housing, 1980

TABLE IV

PERCENT OF TEENS WITH CHILDREN, BY AGE AND NUMBER OF CHILDREN

	Number of Children				
Age	none	one	two	three	four
15	98	2	0	0	0
16	92	8	< 1	0	0
17	85	14	1	0	0
18	79	16	5	< 1	0
19	66	28	5	1	< 1

TABLE V

PERCENT OF TEENS WITH CHILDREN,
BY RACE AND NUMBER OF CHILDREN

	Number of Children				
Race	none	one	two	three	four
White	83	14	2	< 1	< 1
Black	77	19	4	0	0
Indian	82	12	4	1	0
Other	75	25	0	0	0

TABLE VI

PERCENT OF TEENS WITH CHILDREN, BY MARITAL STATUS AND NUMBER OF CHILDREN

	Number of Children				
Marital Status	none	one	two	three	four
single	89	11	< 1	0	0
married	71	22	6	1	< 1
separated or divorced	36	36	28	0	0

TABLE VII

PERCENT OF TEENS WITH CHILDREN, BY POVERTY STATUS AND NUMBER OF CHILDREN

	Number of Children				
Poverty Status	none	one	two	three	four
<.75 of pov line	79	16	5	0	0
.75 to .999	74	21	5	0	0
1.00 to 1.249	80	13	6	1	0
1.25 to 1.499	80	16	4	0	0
1.50 to 1.749	68	30	1	1	0
1.75 to 1.999	80	17	3	0	0
200% or more	88	11	1	< 1	< 1

Source: U.S. Bureau of the Census of Population and Housing for Oklahoma, 1980.

The composition of the sample derived from the Bureau of the Census suggests that there are characteristics that distinguish teenage mothers from teenagers who had not given birth as of 1980. There was a greater concentration of adolescent mothers within the ranks of the poor, less educated, and black population of Oklahoma. Also, a greater percentage of married than single teenage women were adolescent mothers in 1980. Approximately 40 percent of the births were to unwed mothers. Nationally, 42.6 percent of teen births in 1985 were to unwed mothers (Henshaw and Van Vort, 1989, 87).

Explanation of Explanatory Variables

Proxy variables were used for many of the explanatory variables in the statistical model. An explanation of each proxy variable is presented below. Further explanations are also presented for certain other explanatory variables.

Age at First Marriage (AGEMAR)

The age at which a girl's mother was first married is employed as a proxy for the mother's childbearing history as an adolescent. It is not possible to ascertain if teenagers' mothers gave birth as adolescents. However, many women marry during their adolescent years because they are pregnant. Many adolescent wives become pregnant soon after marriage (O'Connell and Moore, 1980). Thus, the age at which a woman first marries should serve as a good indicator of the likelihood that she was a teenage mother.

As mentioned in Chapter III, if a girl's mother was herself an adolescent parent, this is likely to increase the probability that her daughter will also be a teenage mother. Thus, the age at first marriage of teenagers' mothers is expected to be positively related to the probability of adolescent childbearing.

Teenager's Mother's Level of Education (FGRADE)

The level of formal education completed by a teenager's mother is used as proxy for parentally-provided sex education and parental influence on a teenager's attitude toward teen pregnancy. Studies have shown that women who have achieved higher levels of formal education tend to have greater knowledge about human reproduction, sexuality, and pregnancy prevention. Furthermore, well educated women typically have favorable attitudes toward birth control usage and abortion (Goldsmith, et.al., 1983).

Fathers' levels of education appear to have little impact on their teenage daughters' attitudes toward and information about human sexuality and reproduction. However, mothers' levels of education may have a substantial impact on the latter (Olson, 1980). There is expected to be a negative relationship between mother's level of education and the probability of adolescent childbearing.

Religious Favorability Index (REL)

Religiosity is not observable for individual teenagers. However, a proxy for religiosity can be constructed using the results of a 1981 study conducted by Turner. Using a stratified random sample, Turner examined the attitudes of Oklahomans of voting age toward contraceptive usage and abortion. Her study found that religiosity is inversely related to favorability toward teenage family planning and that religious affiliation is closely linked to favorability as well. The percent of adherents to a religion who had favorable attitudes toward family planning (i.e. contraceptive usage and abortion) varies considerably by religious denomination. Table VIII bears out this fact.

TABLE VIII

FAVORABILITY TOWARD TEENAGE FAMILY PLANNING OF RELIGIOUS ADHERENTS, BY DENOMINATION

Denomination	% of Favorable Adherents
Assembly of God	37
American Baptist	60
Southern Baptist	59
Other Baptist	49
Catholic	61
Disciples of Christ	61
Church of Christ	35

TABLE VIII CONTINUED

Church of God	54
Episcopalian	85
Jewish	81
Lutheran	70
United Methodist	74
Pentecostal	38
Presbyterian	77
Other	50

Source: Turner, 1981

Relatively low percentages of individuals affiliated with Assembly of God, Church of Christ, and Pentecostal denominations have favorable attitudes toward teenage family planning. Relatively high percentages of individuals affiliated with Presbyterian, Jewish, Episcopalian, and United Methodist denominations have favorable attitudes.

The impact of religious affiliation on teenage attitudes toward family planning will be a function of the relative proportions of adherents to various denominations in a given county group. For instance, regions which have large numbers of adherents to Assembly of God, Church of Christ, and Pentecostal denominations relative to other denominations are expected to have relatively large numbers of teenagers who have negative attitudes toward contraceptive usage and abortion.

Conversely, regions which have large numbers of adherents to Episcopalian, Presbyterian, Jewish and United Methodist denominations relative to other denominations are expected to have relatively large numbers of teenagers who have positive attitudes toward family planning.

The expected impact of religious affiliation on teenage attitudes toward family planning will be reflected in the relative concentrations of the various religious adherents living in a given area. Based on the empirical results of Turner's study, a religious favorability index toward teenage contraceptive usage and abortion can be used as a proxy for individual religiosity. The index is constructed as follows, for n=15 denominations in each region, r:

$$RFIr = \frac{\sum_{n=1}^{15} \left(\begin{array}{l}\text{Adherents to denomi-}\\ \text{nation n in region r}\end{array}\right)\left(\begin{array}{l}\text{\% favorable adherents}\\ \text{in denomination n}\end{array}\right)}{\text{Total Adherents to all Denominations in region r}} \quad (4)$$

Values for the religious favorability index are computed for each of Oklahoma's 18 census county groups. The computed values represent the degree of religious favorability toward teenage contraceptive usage and abortion within each county group. The impact of religious favorability in any given region may vary across teenage females. It is assumed however, that on average the impact is roughly equal for all teenage females living in a particular region.

Physicians Per Female Aged 15-19 (PPF)

The construction of this variable is based on data provided by the Oklahoma Medical Research Foundation (OMRF, 1987). The OMRF publishes data on the number of physicians by specialty for each of Oklahoma's 77 counties. The number of physicians who are likely providers of family planning services have been identified for each county. Likely providers include physicians practicing the following specialties:

- family practice
- general practice
- internal medicine
- pediatrics
- obstetrics/gynecology

Physician providers of family planning services per teenage female is defined as follows:

$$PPF = \frac{\text{Number of Physician Providers in a Given County}}{\text{Number of Teenage Females in a Given County}} \quad (2)$$

The U.S. Census Bureau sample does not identify individuals by county of residence. However, it does identify them by county group of residence. A weighted average of the PPF for each county group is computed based on the number of teenage females living in each county within that county group. The weighted average PPF is calculated as follows:

$$PPFcg = \sum \frac{(PPF) \text{ \# of teenage girls living in county}}{\text{Total \# of teenage girls in county group}} \quad (3)$$

The weighted average PPF is an index of the availability

of family planning services offered by physician providers. It allows for comparison of the availability of physician-provided family planning services across county groups.

Family Planning Services (FPS)

The primary data obtained from social service agencies in Oklahoma were insufficient to construct a quantitative measure of government funded and nonprofit family planning services across regions. A proxy variable was substituted for that measure, based on the Alan Guttmacher Institute's formula for estimating need of family planning services (Dryfoos, 1973). The Guttmacher Institute estimates family planning needs for those sexually active women who are not seeking pregnancy and whose income is below 200 percent of the official poverty level. The Guttmacher formula was applied to the teenage populace of Oklahoma to estimate the number of teenagers who received services as a percent of all teenagers who needed services in 1979 in each county group.

In regions where relatively high percentages of teenage females in need of family planning services were served, contraceptives were assumed to be more available to teenagers. In areas where relatively low percentages of teenagers in need of family planning services were served, contraceptives were assumed to be less available. Thus, there is expected to be an inverse relationship between the percent of teenage need for family planning services met and the probability of teenage childbearing.

Abortion Availability

The availability of abortion services in a given county group was determined by identifying the presence (at least one clinic) or absence (no abortion clinics) of family planning clinics that performed abortions in 1979. Abortion services were considered to be readily available to teenagers living in county groups in which abortion clinics were present. Teenagers living in county groups contiguous to county groups where abortion clinics are present are also defined to have easy access to abortion services.

Public Assistance Income (FINCT)

The total amount of public assistance income that a teenager is likely to have received is defined as the sum of public assistance payments she received directly plus payments her parents received which she is assumed to have shared with them. This definition of Public Assistance Income is intended to incorporate the teenager's and/or her family's incentive for her to become a teenage mother.

Levels of public assistance income for teenagers and their families are consolidated into one variable to avoid the problem of multicollinearity between these two variables in the regression equation.

Poverty Status (POV)

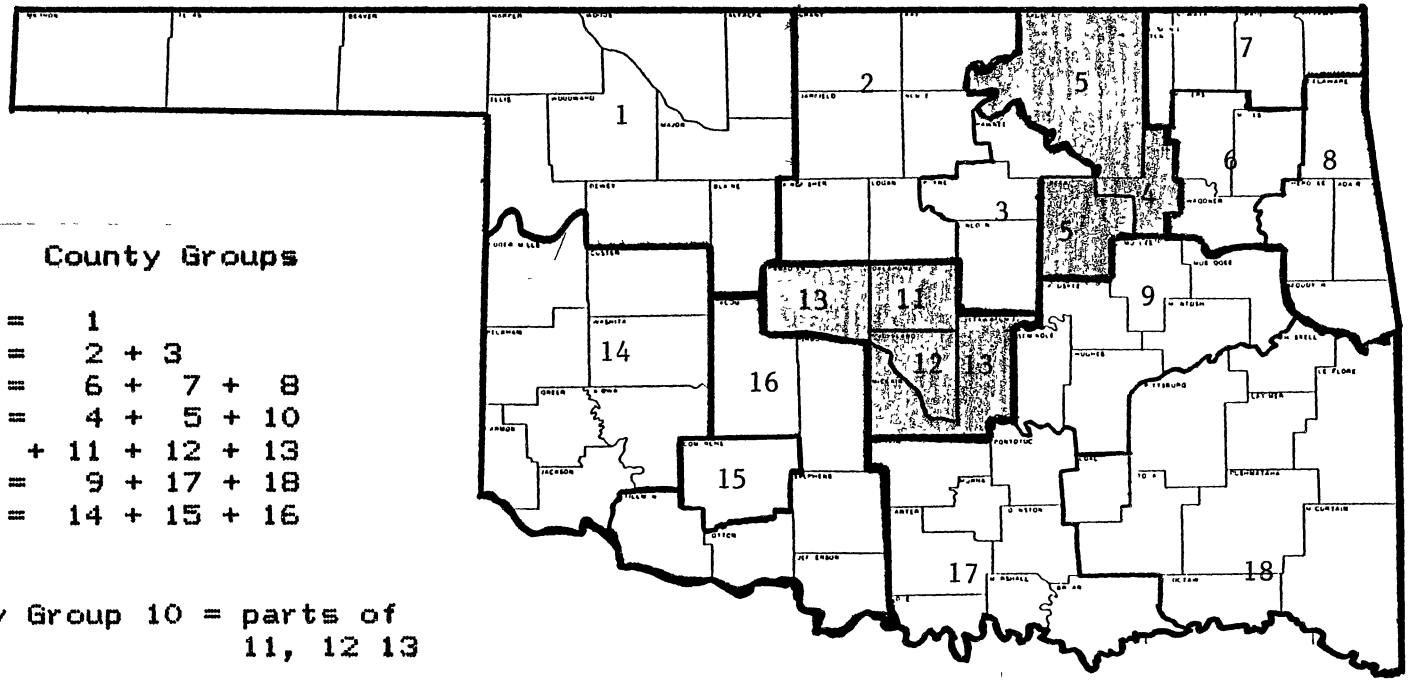
In this study, a teenager's household is in this status if they are officially poor; i.e., if their money income is less than the 1979 poverty threshold (U.S. Bureau of the Census, 1983). The poverty threshold varies according to family size and age of the family head. Money income includes earnings and cash transfers, but excludes in-kind transfers.

Region of Residence

The A sample of the census contains data for individuals in every state and most individual counties with 100,000 or more inhabitants. Counties with populations under 100,000 persons are grouped into analytic units proposed by state data centers called "county groups". County groups are usually composed of a group of contiguous counties that follow state planning district boundaries and reflect general political jurisdictions.

In this study, the individual county groups are consolidated into larger areas called "regions of residence". Regions of residence are comprised of contiguous county groups. The advantage of regional analysis over county group analysis is that it reduces the probability of multicollinearity. There may be very little variation in the dependent and/or independent variables across individual county groups. However, there is likely to be more variation in the former and the latter across regions. Regional analysis captures that

variation and is therefore likely to yield more robust results. Furthermore, regional analysis allows for a comparison of urban and rural differences in teenage childbearing. The map in figure 1 on page 75 delineates the regions, their member county groups and counties.



County Groups

Northwest	=	1
Northcentral	=	2 + 3
Northeast	=	6 + 7 + 8
Urban	=	4 + 5 + 10
		+ 11 + 12 + 13
Southeast	=	9 + 17 + 18
Southwest	=	14 + 15 + 16

Note: County Group 10 = parts of 11, 12 13

Figure 1. Regions of Residence for Oklahoma

CHAPTER V

THE EMPIRICAL FINDINGS

Several versions of equation (1) in Chapter VI were estimated. The empirical model was estimated for younger teenagers (15-17 years old), and for older teenagers (18-19 years old). The likelihood ratio test indicates that there are significant differences between these groups. The model was also estimated extensively to determine the significance of region of residence. Two methods were used for this purpose. In the first method, independent variables were regionalized using the technique of interactive variables. Extensive estimations using this method failed to indicate any significant regional effects. The second method relies on construction of an independent variable that represents the probability of a birth occurring in a particular region and the estimation of Equation (1) with the omission of one region at a time.[1] This estimation was repeated six times to allow the omission of all six regions. Significant results were obtained in two cases: southwest region omitted and urban region omitted. These are the regionalization results reported in this chapter.

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1 The author is indebted to Professor Lee Adkins for his help in designing and implementing this procedure.

The Empirical Results

Tables IX and X show the estimated coefficients of the explanatory variables for both age groups and the impact of regional variation on the probability of teenage childbearing.

TABLE IX

EMPIRICAL RESULTS FOR YOUNGER TEENAGERS

Variable	Beta	t statistic
Intercept	10.6301	1.301
Age	.7330	* 1.680
Grade	.2984	* 1.680
Min	1.2590	* 2.390
School	-.9783	* 2.150
Fagemar	-.1309	* 2.460
Fgrade	.2131	* 2.260
Finct	.0001	1.220
PPF	58.7900	1.230
Unemp	-.1329	1.020
PCI	.7630	.763
LFPR	.0010	.001
ABORT	-1.5440	# 1.510
FPS	-.3330	* 1.700
Rel	-.3511	* 1.850
Pov	-.1141	# 1.440

TABLE IX CONTINUED

Mar	3.0821	* 5.990
Southwest Regionalization		
Northwest	-3.4570	* 1.577
Northcentral	-3.1160	* 1.566
Urban	-3.2150	* 1.912
Northeast	-2.5690	1.253
Southeast	- .0234	* 1.701
Urban Regionalization		
Northwest	-.8097	.571
Northcentral	-.4687	.363
Northeast	-.5679	.005
Southwest	2.6470	* 1.850
Southeast	-.0779	.049

Model Chi Square = 141.59
21 degrees of freedom
R2 = .536
-2 log L = 229.80

TABLE X

EMPIRICAL RESULTS FOR OLDER TEENAGERS

Variable	Beta	t statistic
Intercept	-5.610	1.320
Age	.6127	* 3.222
Grade	-.2844	* 2.541
Min	1.1130	* 2.971
School	-.8191	* 2.010
Fagemar	.0113	.364
Fgrade	-.0183	.144
Finct	.0005	* 2.573
PPF	-34.1300	1.097
Unemp	-.1195	# 1.453
PCI	-.0004	# 1.524
LFPR	.0591	.651
ABORT	-.6104	1.076
FPS	.3644	.277
Rel	-.0315	.267
Pov	-.2073	* 3.767
Mar	2.5440	* 3.694
Southwest Regionalization		
Northwest	-.3473	.318
Northcentral	.6889	.742
Urban	.0209	.024
Northeast	.3854	.494
Southeast	.7060	.842

TABLE X CONTINUED

Urban Regionalization		
Northwest	-.3586	.287
Northcentral	-.0171	.020
Northeast	-.6851	1.181
Southeast	-.3206	.290
Southwest	-.7060	.848

Model Chi Square = 187.68
Degrees of Freedom = 21
R2 = .467
-2 log L = 481.48

For a one-tailed test:
* = .05 level of significance
# = .10 level of significance

Interpretation of the Empirical Results

Overall Fit of the Models

The R2 statistic is the coefficient of determination and represents the percent of variation in the dependent variable that is explained by the independent variables. The chi square statistic represents the level of statistical significance for the models given 21 degrees of freedom.

Younger Teenagers. The value of the R2 statistic (.536) implies that 53.6 percent of the variation in the probability

of teenage childbearing among younger teenagers is explained by the explanatory variables in the model. Additionally, the value for the chi square statistic (151.59) implies that the model has a high level of statistical significance (significant at the .005 level).

Older Teenagers. The value of the R2 statistic (.467) implies that 46.7 percent of the variation in the probability of teenage childbearing among older teenagers is explained by the independent variables in the model. The chi square statistic (187.87) implies that the model has a very high level of statistical significance (significant at the .005 level).

The empirical results also suggest that the overall fits for the models are approximately equal for younger and older teenagers. The signs, magnitudes of impacts and levels of significance for the explanatory variables vary considerably across the models for older and younger teenagers. Those differences are discussed below.

Significance of the Age-Partitioned Models

A Likelihood Ratio Test is employed to determine if there is a significant difference between the estimated models for younger and older teenagers. The results of this test are shown below. The hypothesis to be tested is that there is not a significant difference in the model estimates.

Ho: There is not a significant difference between the estimated models for younger and older teenagers.

Ha: There is a significant difference between the estimated models for younger and older teenagers.

Likelihood Ratio (LR) Test [2]

Computed value = -2 log [restricted - unrestricted model]

= 736.10 - 711.28 = 24.82

-2 log (LR) unrestricted = 481.48 + 229.80 = 711.28
-2 log (LR) restricted = 736.10

Computed Value (LR) = 24.82

Critical Value (X^2 at .05 significance level) = 3.84

If computed value LR > critical value X $\Longrightarrow$ reject Ho.

$\therefore$ Reject Ho $\Longrightarrow$ There is a significant difference.

The Likelihood Ratio Test shows that there is a significant difference in the estimated models for younger and older teenagers.

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[2] To perform the likelihood ratio test, the restricted model is estimated using the entire sample (i.e. 15-19 years old), and the unrestricted model is estimated separately for younger and older teenagers. The values for the log likelihood functions are used in the test statistic accordingly. The author is indebted to Professor Lee Adkins for his assistance in designing this procedure.

Analysis of the Explanatory Variables

Age. The impact of age appears to be slightly stronger among younger teenagers. Most teenage females become fecund (i.e. able to reproduce) between the ages of 13 and 17 (Cutright, 1977). The stronger impact of age among younger teenagers may reflect teenagers' "passage" from puberty to fecundity. As a result, sexually-active teenagers' probability of adolescent pregnancy and childbearing is increased. Among older teenagers, the impact of age probably represents a combination of the impact of increased fecundity and greater frequency of sexual intercourse on teenage childbearing. The relationship between age and teenage childbearing is no surprise. Other research supports this finding (Cutright, 1977; Moore, 1977).

Years of School Completed (GRADE). The empirical results show a negative and statistically significant relationship between level of education and the probability of teenage childbearing among younger and older teenagers. The magnitude of this variable is approximately equal for both age groups. The negative relationship is most likely a reflection of the impact of the opportunity costs associated with teenage motherhood. Teenage females with higher levels of education have more human capital to offer prospective employers and thus are likely to earn higher levels of income. Teenage females who have completed relatively less education will have smaller sacrificed earnings as a result

of teenage motherhood.

Years of education completed is highly correlated with age. However, these variables may be measuring the impacts of two entirely separate phenomena (i.e. biological versus economic effects). Thus, the impact of years of school completed may be distinct from that of age.

Minority Status (MIN). Being a member of a minority group has a statistically significant and positive impact on the probability of adolescent childbearing among teenagers of all ages. For reasons submitted in Chapter III (i.e. fewer economic resources, cultural diversity, different sets of attitudes, etc.) this finding is expected. Members of minority groups in Oklahoma tend to be economically disadvantaged. They may also have a cultural heritage and a sense of posterity, however, that is independent of their socioeconomic status. As a result, their attitudes toward early childbearing may be more accepting.

School Enrollment Status (SCHOOL). The empirical findings reveal a statistically significant and negative relationship between school enrollment status and the probability of teenage childbearing for both younger and older teenage females. The impact of this variable is slightly stronger for younger teenagers.

This result is consistent with what was hypothesized and is probably a reflection of differences in opportunity costs

associated with teenage motherhood. Pregnant teenagers enrolled in school are likely to face greater opportunity costs (because, for example, of school activities and career goals sacrificed) from childbearing than those who are not.

The census data do not distinguish between pregnant teenage enrollees and nonpregnant teenage enrollees. However, the hypothesized relationship between school enrollment and adolescent childbearing is identical regardless of pregnancy status. Teenagers, pregnant or not, who are enrolled in school are likely to have higher career aspirations than teenagers not enrolled in school and therefore would sacrifice more as a result of teenage motherhood.

School enrollment status also may be a reflection of variation in levels of knowledge about human sexuality and reproduction across teenagers. For instance, teenage females who are enrolled in school are more likely to be exposed to a sex education course than those who are not. Greater levels of sex education will enhance teenagers' abilities to make informed decisions regarding sexual intercourse, conception, and pregnancy. This in turn, will reduce the likelihood that they will become pregnant.

Teenager's Mother's Age At First Marriage (FAGEMAR). Among younger teenagers, there is a statistically significant negative relationship between teenagers' mother's age at first marriage and the probability of teen childbearing. There is a positive, but not statistically significant, rela-

tionship between the former and the latter among older teenagers.

Age at first marriage is employed as a proxy variable for a mother's childbearing history as a teenager (i e. whether the teenager's mother gave birth in her adolescent years). Teenagers' mothers who were themselves teenage mothers are expected to have more accepting attitudes toward teenage motherhood. Mothers' attitudes are expected to influence their daughters' attitudes toward early motherhood. This in turn influences the probability of adolescent childbearing.

It is interesting to note the difference in results between younger and older teenagers. The statistically significant negative relationship for younger teenagers implies that higher ages at marriage for their mothers cause lower probabilities of adolescent childbearing. This finding is consistent with what was hypothesized.

The impact of mothers' age at first marriage on the probability of childbearing among older teenagers is less certain. The positive coefficient for mothers' age at first marriage is not significantly different from zero. Thus, mothers' attitudes toward early motherhood, as measured by age at first marriage, has no significant effect on the probability of teenage childbearing among older teenagers.

The difference in these results for older and younger teenagers suggests that the impact of mother's age at first marriage on adolescent childbearing diminishes as teenagers

grow older. Thus, parents appear to be important to teenage females' fertility decision-making in the early years of adolescence. This finding is consistent with other empirical research (Shah and Zelnik, 1981) which stresses that younger teenagers are affected more than older teenagers by their parents.

Education Level of Teenager's Mother (FGRADE). Among younger teenagers there is a statistically significant positive relationship between education level of teenagers' mothers and the probability of adolescent childbearing. There is a negative, but not statistically significant, relationship between the former and the latter among older teenagers. Mother's level of education is employed as a proxy for two factors: (1) the influence of parental attitude toward early childbearing and (2) the impact of the provision of parental information. These factors in turn influence the probability of adolescent childbearing.

Mothers with relatively high levels of education are expected to have more accepting attitudes toward contraceptive usage among younger adolescents. Well-educated mothers also tend to be well-informed about matters related to human sexuality and reproduction. As a result, it was hypothesized that teenage daughters of well-educated mothers would be less likely to become teenage mothers. The empirical findings do not confirm this expectation, however.

Among younger teenagers, the significantly positive re-

lationship is not easily explained. The impact of mothers' higher levels of education is likely to increase their daughters' knowledge about human sexuality and reproduction and thus enhance the latters' abilities to make informed decisions. Perhaps, teenagers of well-educated mothers have preferences such that they are more prone to want children (perhaps out of rebellion) early in their lives. For teenagers who wish to bear children, well-informed decision-making will likely enhance their ability to carry out their intentions. Well-educated mothers of teenagers who desire to become pregnant may have more accepting views of teenage childbearing as well as teenage contraceptive usage and thus lend encouragement for, and support to their daughters's decisions. Alternatively, better-educated mothers may provide better information but less parental supervision and involvement. The better-educated mother is more likely devoting relatively more time to her career and relatively less time to her daughter's problems.

Thus, the possibility of differences between mothers' and daughters' preferences for teen births, well-informed decision-making, parental encouragement and support, and lack of parental supervision may explain why there is a positive relationship between mother's level of education and the probability of adolescent childbearing.

Public Assistance Income (FINCT). There is a positive, but not statistically significant relationship, between level

of public assistance income and the probability of teenage childbearing among younger teenagers. There is also a positive, but statistically significant relationship, between the former and latter for older teenagers. Thus, higher levels of public assistance income are associated with higher probabilities of childbearing for older teens.

The empirical results support the hypothesized relationship between the two variables. Although the findings are not statistically significant for younger teenagers, this is not a surprising result. Younger teenagers are more likely to be living with their parents and less likely to receive public assistance income directly.

Among older teenagers, the size of the coefficient on FINCT implies that public assistance income has a positive, but very small, effect on adolescent childbearing. Older teenagers are legally defined to be adults. Thus, regardless of their residence status (i.e. living with parents or with spouse, or alone) older teenagers are more likely to be free from parental supervision and less likely to be influenced by their parents.

Older teenagers are also more likely to be living away from their parents and thus are apt to be more financially independent than are younger ones. They are also more likely to be contemplating their future (i e. career, family, etc.) and are therefore probably more responsive to economic stimuli such as changes in income and costs of living. Higher levels of public assistance income may be perceived as a

reduction in the opportunity costs of childrearing and therefore may act as an incentive for older teenagers to bear children. This is particularly true for teenage girls (married or not) who are planning to have a child in the near future (i.e. next 1 to 2 years). In these cases, eligibility for and receipt of public assistance income may simply be expediting the childbearing process for older teenagers

Physician Providers per Female Aged 15-19 (PPF). There is a positive relationship between the number of physician providers of family planning services per female aged 15-19 and the probability of teenage childbearing among younger teenagers. There is a negative relationship between the former and the latter among older teenagers The results are not statistically significant for either group, however. This finding suggests that the availability of physician-provided family planning services is not an important factor in determining adolescent fertility among teenagers in Oklahoma.

Given that the provision of family planning services through physicians does not influence teen pregnancies in Oklahoma, the provision of these services from public and non-profit clinics may be of substantial importance.

Unemployment Rate (UNEMP). There is an unexpected negative relationship between the unemployment rate and the probability of adolescent childbearing for younger and older teenagers. The magnitude of this relationship is approxi-

mately equal for both groups; however, it is statistically significant for older teenagers only.

It was expected that rates of unemployment would be a partial reflection of the opportunity cost associated with teenage childbearing. Higher rates of unemployment imply fewer opportunities for future employment and therefore lower opportunity costs of bearing children. This, in turn increases the probability of adolescent childbearing in a given region. The empirical findings do not support the preceeding hypothesis. However, is an alternative explanation for these unexpected results, related to the relationship between economic prosperity and childbearing among married teenage couples. In regions where high percentages of older teenage females are married, a low unemployment rate may indicate that economic conditions allow teenage wives to quit their jobs (or not seek employment) and start bearing children. The income of their husbands may be more than adequate to support a family. For teenage couples who planned to start a family in the near future, economic conditions (as indicated by the unemployment rate) may be such that they are able to start one earlier than they had originally planned. In this case, also, the unemployment rate is not viewed as an indicator of the opportunity cost of adolescent childbearing but rather serves as an indicator of economic conditions which influence the ability to afford a child.

Per Capita Income (PCI). There is a negative relationship between regional per capita income and the probability of adolescent childbearing among older teenagers only. The relationship is statistically significant among older teenagers only, and the magnitude of the impact is relatively small. Among younger teenagers, the impact of per capita income is not significantly different from zero and thus is not an important factor in explaining the probability of teenage childbearing.

For older teenagers, however, the statistically significant relationship implies that higher levels of regional per capita income are associated with lower levels of adolescent childbearing. This is likely a reflection of the opportunity costs associated with teenage childbearing. Regional per capita income is a general indicator of economic prosperity and may reflect the relative number of lucrative employment opportunities available to teenagers. Older teenagers are expected to be more eligible for labor force participation.

Mobile teenage females will relocate from regions with relatively low numbers of career opportunities to more prosperous areas. Less mobile teenage females will not. Although most teenage females are assumed to be relatively immobile, some relocation probably occurs. In the complete absence of teenage mobility, however, the impact of per capita income on the probability of adolescent childbearing would be greater than the empirical findings suggest.

Female Labor Force Participation Rate (LFPR). There is a positive, but not statistically significant, relationship between the rate of female labor force participation and the probability of teenage childbearing among all teenage females. Thus, this variable is not an important factor in explaining teenage childbearing.

The female labor force participation rate is theorized to reflect variation in societal attitudes toward early motherhood. The empirical results imply that societal attitudes do not significantly affect teenagers' attitudes toward career goals and/or early childbearing. It is possible that this variable is not an appropriate proxy variable for societal attitudes, however.

Abortion Services (ABORT). There is a negative relationship between abortion availability and the probability of teenage childbearing among younger and older teenagers. The relationship is statistically significant among younger teenagers only. Availability of abortion is measured by the presence (or absence) of abortion clinics in teenagers' regions of residence.

This empirical finding is consistent with what was hypothesized. Lower levels of contraceptive usage and partner communication result in relatively higher numbers of unintentional pregnancies for younger teenage females. Younger teenagers are also more apt to prevent their parents from learning of their pregnancies than are older teens. The

anonymity that most abortion clinics guarantee may facilitate younger teenagers' attempts to maintain secrecy of their abortion and/or pregnancy. Essentially, the availability of abortion represents a mechanism which allows younger teenagers to correct what they perceive to be a potential costly "mistake". Thus, the availability of abortion may represent a more important component of "birth control" for younger teenagers.

The insignificant impact of abortion availability among older teenagers is somewhat difficult to explain. Older pregnant teenagers may rely on abortion providers (hospitals, private physicians, etc.) other than abortion clinics. Or, perhaps, older sexually-active teenagers are less likely to become unintentionally pregnant than are younger ones. Among older teenagers, there is better informed decision-making, greater frequency of contraceptive usage, and a greater number of intentional pregnancies. Additionally, older teenage females who become pregnant may be more likely to receive support (financial and emotional) from their sexual partners <u>after</u> they discover their pregnancies than are younger ones.

In many cases pregnancies among older teenagers may not be perceived as extremely costly mistakes because older teenagers tend to be more certain about their future plans. Thus, they may be more likely to chose childbirth rather than terminating their pregnancies. As a result, abortion availability may be less important for pregnant older teenagers.

Government-Funded Family Planning Services (FPS) Among younger teenagers, there is a negative and statistically significant relationship between availability of publicly-funded family planning services and the probability of teenage childbearing. Among older teenagers there is a positive, but not statistically significant, relationship between the former and latter.

The empirical findings support what was hypothesized in Chapter III. A higher probability of teenage childbearing is associated with low availability of family planning services. Teenagers who live in regions where family planning services are readily available are afforded greater resources to carry out their fertility decisions. Availability of family planning services is measured by the number of sexually-active teenagers who were below 200 percent of the official poverty level who received family planning services as a percent of those teenagers that actually needed them. This measure serves as a general indicator of the availability of family planning services for all but the most affluent teenage females in a given region.

The empirical results imply that the impact of availability of publicly funded family planning services on adolescent childbearing diminishes as teenagers grow older. Family planning services availability is likely to be important to teenage females of all ages. Among younger teenagers, client confidentiality will be an important factor in determining whether they will seek public family planning

services. Public clinics are less likely to contact the parents of teenagers who obtain contraceptives from the former than are physician providers in private practice. Thus, younger teenagers' fertility decisions are affected by the presence (or absence) of public clinics that provide family planning services.

Among older teenagers, the availability of family planning services via public clinics is not an important factor explaining teenage fertility. Older teenage females are probably less concerned about parental notification and have greater financial resources and independence. As a result, they are more likely to rely on private sources for family planning services. It is also important to note that older teenage females' sexual partners are likely to maintain a higher degree of contraceptive preparedness. Thus in some instances, older teenage females need not worry about obtaining contraceptives for future sexual encounters.

Religious Favorability Index (REL). Among younger and older teenage females there is a negative relationship between the religious favorability index and the probability of teenage fertility. This relationship is statistically significant, however, for younger teenagers only.

The religious favorability index measures the relative numbers of religious adherents in a given region who are favorable to teenage usage of family planning services. This index varies according to the relative numbers of members of

various religious denominations across regions. In regions with relatively high concentrations of favorable religious adherents, greater numbers of younger teenage females are likely to be affected by religious doctrine than in regions with relatively low concentrations of the former. The index is employed as a proxy to measure the impact of religious affiliation (not provided in the Census data) on the probability of teen childbearing. Religious affiliation influences teenagers' attitudes which in turn affect their fertility choices.

The empirical findings for this variable are consistent with what has been determined for other variables which reflect attitudes; namely, that younger teenagers are more likely to be affected than older teens. In this case, younger teenagers may be attending church more regularly, participating more frequently in church related activities, and/or are more influenced by their parent's religious attitudes than are older teenagers. As a result, religious doctrine (measured by the religious favorability index) affects the probability of teenage childbearing by affecting the attitudes of teenagers.

Because older teenagers are more likely to be independent of parental supervision, they may attend church less frequently than younger teenagers. In other words, the parents of older teenagers may not make the latter attend church or participate in church-related activities.

Poverty Status (POV). Among all teenagers there is a negative and statistically significant relationship between poverty status and the probability of adolescent childbearing. Poverty status is employed as a proxy for family economic well-being The empirical results imply that the higher income is above the poverty line, the lower the probability of adolescent childbearing. This finding supports the hypothesized relationship in Chapter III, and is consistent with the results of other empirical studies.

Specifically, the economic well-being of an individual may represent her hopes and perceived chances of achieving a higher standard of living in the future. Teenage females with relatively low levels of economic well-being may perceive the prospects of achieving a higher standard of living as hopeless. As a result, they substitute the experience of immediate motherhood for the (perceived) slim chance of improving their standard of living. Conversely, relatively affluent teenage females are more likely to see their futures as bright and promising. Thus, they are more likely to chose to pursue their career goals and put off childbearing until later in life.

Marital Status (MAR). Among all teenage females there is a strong positive and statistically significant relationship between marital status and the probability of adolescent childbearing. This finding probably reflects differences in the importance of several factors between married and nonmar-

ried teenage females.

Teenagers who are married are more likely to have higher levels of sexual activity, and share similar attitudes toward childbearing, and good communication regarding their fertility goals. Therefore, it seems likely that married teenage females will be more efficient in fertility decision-making and thus have fewer unintentional pregnancies than nonmarried teenage females.

The empirical results for marital status do not necessarily imply, however, that it is a determinant of teenage childbearing. Rather, it may reflect one of two other phenomena: (1) an effort to guarantee the legitimization of a child conceived before marriage, or (2) an early "planned" family among teenagers who marry and begin having children soon afterward.

It is not possible to sort out the percentage of births to teenagers who were pregnant before marriage and the percentage born to married teenagers who became pregnant after they wed. Thus, the findings in this study do not necessarily imply a causal relationship between marital status and adolescent childbearing. They suggest only that marital status is significantly associated with the probability of teenage childbearing among teenage females of all ages.

Regional Impacts

Teenage birth rates vary across regions in Oklahoma. The "region of residence" variable is designed to test for

significant differences between regions. In this study, the impact of each region is determined by isolating each region (i.e. taking it out of the regression) and estimating the coefficients of all other region of residence variables left in the regression equation. The signs of the region variables remaining in the regression indicate whether their impacts are greater or less than the impact of the region which has been isolated. For instance, a negative sign for a region variable indicates that the impact of living in that region is less than the impact of living in the region that was taken out of the regression.

This procedure was applied for all six regions in Oklahoma. The most significant equations are reported: those comparing other regions to the southwest, and those comparing other regions to the urban region.

Southwest Regionalization. In the southwest regionalization, the impact of living in the southwest part of Oklahoma is compared to that of living in other regions of the state. Among younger teenagers there is a negative and statistically significant relationship between all other regions (except the Northeast) and the southwest region. This implies that among younger teenagers the impact on teenage childbearing of living in any other part of Oklahoma (except the Northeast) is significantly less than the impact of living in the southwest part of Oklahoma. Among older teenagers there are no statistically significant differences exerted on

fertility by region of residence.

Urban Regionalization. In the urban regionalization, the impact of living in the Tulsa and Oklahoma City urban areas is compared to the impact of living in other regions of the state. The most significant finding is that, for younger teenagers, residency in the southwest region is associated with a greater probability of a teenage birth than residency in urban Oklahoma. This finding is consistent with the results of the southwest regionalization.

In summary, both comparisons show that, among younger teenagers, residency in the southwest region is more likely to result in a teenage birth. The residency of older teenagers appears to be unrelated to the probability of a teenage birth. Unfortunately, we do not know why residency in the southwest is important. The failure of the interactive variables technique to reveal any significant effects of region of residence on the independent variables included in equation (1) suggests, however, that the reasons lie with factors outside the purview of this analysis.

CHAPTER VI

POLICY IMPLICATIONS AND CONCLUSIONS

The empirical findings of Chapter V suggest that certain public policy actions may be useful in diminishing the probability of teenage childbearing in Oklahoma. Existing evidence from previous studies is consistent with many of the findings of this study.

Policy Implications from Empirical Findings

The empirical findings suggest the following remedies for reducing the probability of adolescent childbearing:

- Encourage teenagers to stay in school.
- Increase accessibility to abortion for younger teenagers.
- Increase availability of family planning services for younger teenagers.
- Reduce poverty for families with teenagers.
- Enhance economic opportunity, especially for older teens.
- Cut back public assistance for older teenagers.
- Increase unemployment.

Although the empirical analysis reveals a significant positive relationship between the probability of teen childbearing and public assistance, and a significant negative relationship between teen births and unemployment rates, it is not recommended that the policy initiatives inherent in these relationships be used.

The reduction of public assistance as a means of reducing teenage childbearing is not recommended because the core

of the problem appears to be teen pregnancy rather than teen births. It is not certain that the findings of this study are consistent with a positive relationship between public assistance and teen pregnancies (as opposed to births) Other studies have failed to find such a relationship (Moore and Caldwell, 1977; Moore, 1978; and Singh, 1986).

The reduction of public assistance would probably harm the very persons it is designed to help, the children of teen parents. Policies which address the issue of minimizing the chances of long-term dependency on public assistance through the adoption of improved and well-funded workfare and child care assistance programs are likely to be more beneficial to teen parents and their children.

The option of increasing the unemployment rate as a way of reducing teenage births seems cruel and costly Furthermore, the unemployment rate can be manipulated by actions of the federal government, but not by state governments.

Keeping Teens in School

Teenagers enrolled in school are less likely to give birth than those who are not. Therefore, effective drop-out prevention strategies would likely reduce the birthrate for first-time mothers and for teenagers who have already given birth.

To insure that a student will never drop out of school, the state may have to devote substantial resources to programs like the federal Head Start program, which attempts to

achieve parity in terms of educational opportunity between disadvantaged four and five year olds and their more advantaged peers. Studies (National Conference of State Legislatures (NCSL),[1] 1987; Schweinhart, 1985) have shown that these programs provide lasting gains in the form of continued school involvement.

Beyond Head Start there are undoubtedly other strategies which deserve close inspection.* Virginia has initiated a program in which students identified as at-risk for dropping out of school are paired with a local business owner who helps provide motivation and an example of the value of a high school education. The U.S. Department of Labor and the Ford foundation established a promising Summer Training and Employment Program (STEP) in 1985 in five cities. This program is designed to help 14-15 year olds remain at grade level and provide them with information to prevent unwanted pregnancies.

Within two years of initial motherhood, a large percentage of teenage mothers (31%) have a repeat pregnancy (Mott, 1986). Programs which encourage teenage parents to remain in school should facilitate the prevention of repeat pregnan-

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1 Further information on the state initiatives mentioned in this section is available through the National Conference of State Legislatures (NCSL). Brief descriptions are available in NCSL, State Legislative Report (1988, 1989).

Prior to 1972, public school systems had the option of suspending pregnant teenagers from attending classes. However, Title IX of the 1972 Education Amendments proscribed school systems from dismissing pregnant teenagers from class and allowed for the provision of separate educational programs for pregnant teenagers. Even with the passage of new legislation, local school districts have been slow in providing such programs (Zellman, 1982). Declining enrollments and fiscal difficulties, the admission that pregnancy is a problem in public schools, and the belief that pregnancy is a family matter exclusively have created barriers to the establishment of special programs. As a result, many administrators have done nothing more than comply with the regulations forbidding the exclusion of pregnant students from classes.

Some states are now starting to address the issue of teen parenthood. In Virginia, for example, the Department of Education provides work-study and training opportunities for teen parents. A few states require that minor parents receiving AFDC benefits attend school. In Minnesota, these parents must also participate in a social services plan which includes job training and enhancement of work skills.

A special effort is being made in Rhode Island to supply local child care information to teenagers who wish to finish their education. In Tennessee, the state departments of education and human services are mandated to aid local school districts in developing school-based day care and parent training centers.

Within Oklahoma, there are special programs in Oklahoma City (Emerson School) and Tulsa (Margaret Hudson) which offer education to teen parents. These programs currently serve only a small percent of the state's teen parents; most teens served, however, do remain in school. It appears that few resources are devoted to the resolution of this aspect of teen pregnancy in Oklahoma. Given the self-reported success of Emerson and Margaret Hudson, consideration should be given to establishing more of these programs in Oklahoma.

Making Abortion More Accessible

The empirical results imply that more widespread provision of abortion facilities would reduce the teenage birthrate in Oklahoma (particularly among younger teenagers). Although such a policy would raise great opposition, the evidence from this study suggests that there is unmet need. Following a procedure similar to that of the Swedish model by providing improved sex education and teenage family planning services may reduce the need for abortion in Oklahoma.

Making Family Planning Services More Accessible

The empirical results of this study show that increased accessibility to family planning services reduces teenage births. The findings of other studies support these results (Chamie, et al., 1982; Zelnik and Kantner, 1979; Zabin and Clark, 1981, 1983). Moore and Burt (1980) suggest that welfare offices, with their high numbers of teen parent clients,

could be used more effectively as sites to offer low-cost services to prevent repeat pregnancies. They also suggest that these offices could work directly with teenage children in welfare families to prevent first-births.

An increasingly popular means of addressing pregnancy prevention among teenagers is the school based-clinic. School-based clinics are relatively new (10 years old) and are present in 30 states. These clinics are designed to help teenage females in school by assisting and improving the "entire" individual. All school-based clinics provide physical examinations, medical screenings, counseling on family planning; some provide gynecological examinations, and treatment for sexually transmitted diseases. Counseling in the areas of nutrition and weight control, mental health, employment and family counseling is also provided A few clinics provide contraceptives as well (Dryfoos, 1988).

School-based clinics assist teenagers in developing rational and responsible decision-making skills related to human sexuality and reproduction, educational attainment, and career aspirations. The majority of programs operate a single clinic with 85 percent of these located within school buildings and the remainder located adjacent to school grounds.

Although school-based clinics are usually funded by private foundations, local health programs are becoming increasingly important in funding these programs. School systems do not generally fund or operate clinics directly. Rather, lo-

cal agencies establish clinics which are typically a satellite of ongoing health and social programs. The current level of public funding of school based clinics is unknown. In recent years, however, several states have started programs which focus on high-risk youth. Other states have made appropriations specifically for funding school based clinics. Many clinics are funded through maternal and child health block grants and/or Medicaid funds; others are funded through state demonstration grants.

There has been controversy over the presence of school-based clinics in public school systems and their impact on levels of teenage sexual activity. However, growing evidence suggests that participation in a school based clinic does not increase levels of sexual intercourse among teenage females, but does increase contraceptive usage among them (Dryfoos, 1988). The primary objective of school based clinics is not to specifically address the issue of sex education or family planning services per se. Rather, their goal is to enhance the well-being (emotional, physical, mental) of the individual so that she can set goals for herself, make informed, responsible decisions, and successfully complete her education.

School-based clinics in St. Paul, Minnesota are frequently recognized for their success in adolescent health education. These clinics serve 2,000 students directly and reach many more clients through educational programs every year. Results of evaluation indicate that teenage pregnancies and repeat pregnancies have continually declined, that

sexually active teenagers are more careful about contraceptive practices, and that larger numbers of teenage mothers are finishing their high school education (Health Start, Inc 1986).

Outside the schools, there appears to be a need for reducing the stigmatization associated with using publicly-funded clinics, and for making them more accommodating to teenagers in terms of client confidentiality and hours of operation. Recently, Illinois implemented a comprehensive teen pregnancy prevention strategy which has several community-based programs, and operates a toll-free hotline that teenagers can call for referrals to programs in their area (NCSL, 1989).

The programs provide medical, social, nutritional, educational and vocational services through grants with the Department of Public Health and the Department of Children and Family Services. Contracting agencies include local health departments, hospitals, community health agencies, mental health agencies, family planning agencies, and several different church denominations.

Within Oklahoma, the Adolescent Health Program is operated in 13 county health departments. The unusually low teen birthrate in Payne County may be a partial reflection of this program. Thus, a thorough evaluation of this alternative (particularly in Payne County) is warranted, with the view of expanding it to other parts of the state if it is shown to make a significant difference.

Reducing Family Poverty

Girls living below the poverty line in Oklahoma have a higher probability of giving birth during their teen years than girls from families with incomes above the poverty line. Thus, policies which assuage poverty would appear to be helpful in decreasing teenage fertility rates. Those policies which augment peoples' ability to enhance their standard of living are likely to be more effective as a birth-reducer than those which simply provide public support sufficient to increase a family's income above the poverty line. This follows from the belief (and some evidence from this study) that family dependence on public support tends to diminish a teenager's aspiration for a higher standard of living, and therefore the expected opportunity costs to her of raising a child.

Specific remedies for resolving family poverty might include anti-poverty policies that increase the payoff, or provide jobs for, working poor-families with heads who worked during the year but earned incomes below the poverty line Additionally, policies which facilitate heads of households of AFDC families to enter, and stay in, the work force may be effective. State initiatives in the areas of medical protection, earnings supplements, child care assistance, and employment and training assistance may help the working poor. AFDC family heads could be helped through more effective work fare programs which deliver skills evaluation and provide job

training and job placement prior to the enforcement of a work requirement.

Increasing Opportunities for Women

The reduction of poverty is only part of a greater need to enhance economic opportunity for women. Typically, females are provided far less in the form of economic opportunity than are men. Providing females with equal opportunities for self-support to those for men could help reduce teenage fertility in Oklahoma. Certainly, teenage births are more costly when economic opportunities are greater and teenagers are rational enough to behave accordingly. Future research on methods of decreasing teenage fertility should thoroughly address the issue of improving economic opportunities for females.

Policy Prescriptions Based on Other Sources

Sex Education

Although it was not possible to develop and test a quantitative measure of sex education in this study, evidence from other studies supports the need for comprehensive sex education in the schools (Moore, 1977; Dawson, 1986; Zelnik and Kantner, 1982). These studies have shown that exposure to such a course does not significantly increase teenage sexual activity, but that it does increase teenagers' knowledge of many aspects of human reproduction and human relation-

ships, and the consequences of teenage pregnancy and childbirth. Furthermore, sexually active teens who have been exposed to a comprehensive course in sex education are less likely to become pregnant than their peers who have not had such a course.

One school-based program that may prove to be an effective prevention strategy is family life education. Family life education includes instruction in human sexuality, family planning, interpersonal relations, decision-making skills and positive role-modeling. Instruction is provided as part of the regular curriculum and can be adapted to any grade level.

Comprehensive family life education curricula encourage responsible sexual behavior and explain human sexual development in a supportive learning environment. Researchers and practitioners concur that this method reduces misinformation about human sexuality and reproduction and provides transferable decision-making skills to teenagers.

Family life education is now required by law in 15 states including Kentucky, Iowa, Vermont, and Virginia (NCSL, 1988). Instruction is required on a range of topics that include self-esteem, goal setting, decision-making, communication skills, peer pressure, family violence, sexual responsibility and parenting skills.

Oklahoma appears to be a late-comer in implementing sex education in the schools. However, a comprehensive program such as the one discussed above would likely prove successful

in increasing Oklahoma teens' awareness of responsible sexual behavior.

Making the Father Liable

Oklahoma among many other states, has paternity establishment and child support enforcement laws and programs. These policies do not specifically address the special needs and problems of the teenage population. The costs of promulgation and enforcement of child support laws are presumed high relative to the benefits in terms of dollars collected. However, the benefits from the reduction of teenage births may more than offset the actual dollars collected and far exceed the costs of a more ambitious policy.

There is no empirical evidence to suggest that such an effort will reduce teenage fertility. But, the promotion and aggressive enforcement of laws which encourage paternity establishment may have the effect of sufficiently raising the cost to males to induce them to change their behavior. Thus, the Oklahoma State Legislature should consider ways to target the fathers of children born to teenage girls. This includes paternity establishment, enforcement of support orders, and making absent parents (typically the father) more financially responsible.

Suggestions for Future Research

The results of this study leave many questions unanswered. Studies which address the following issues can likely

benefit from the theoretical foundation and empirical findings of this study:

- Determination of cost-effective government policies to reduce the incidence of adolescent childbearing in Oklahoma.
- Application of the model in this dissertation to studies of other states or all fifty states combined.
- Replication of this study using updated data from the 1990 Census of Population and Housing for Oklahoma.

Further study of Oklahoma is also in order to determine what factors explain the apparently high incidence of teen births in the southwestern part of the state, and to determine the influence of the sex education that is being provided to Oklahoma's elementary and secondary students.

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APPENDIX

TABLE XI

DEMOGRAPHIC CHARACTERISTICS OF NORTHWEST REGION

AGE

NUMBER OF CHILDREN	15	16	17	18	19	TOTAL
NONE	7	10	16	9	13	55
ONE	0	2	1	4	7	14
TWO	0	0	0	0	1	1
THREE	0	0	0	0	0	0
TOTAL	7	12	17	13	21	70

RACE

	WHITE	BLACK	INDIAN	OTHER	TOTAL
NONE	51	1	3	0	55
ONE	14	0	0	0	14
TWO	1	0	0	0	1
THREE	0	0	0	0	0
TOTAL	66	1	3	0	70

MARITAL STATUS

	MARRIED	DIVORCED	WIDOWED	SEP.	SINGLE	TOTAL
NONE	22	1	0	0	32	55
ONE	4	0	0	0	10	14
TWO	1	0	0	0	0	1
THREE	0	0	0	0	0	0
TOTAL	27	1	0	0	42	70

TABLE XI CONTINUED

YEARS OF SCHOOL COMPLETED

NUMBER OF CHILDREN	7	8	9	10	11	12	13	14	15	TOTAL
NONE	1	4	5	16	7	17	3	1	1	55
ONE	0	0	2	2	1	8	0	1	0	14
TWO	0	0	0	0	0	1	0	0	0	1
THREE	0	0	0	0	0	0	0	0	0	0
TOTAL	1	4	7	18	8	26	3	2	1	70

POVERTY STATUS

	% OF OFFICIAL POVERTY LINE							
	< 75	75 99	100 124	125 149	150 174	175 199	>200	TOTAL
NONE	7	6	3	6	1	1	31	55
ONE	0	2	1	1	0	0	10	14
TWO	0	0	0	0	0	0	1	1
THREE	0	0	0	0	0	0	0	0
TOTAL	7	8	4	7	1	1	42	70

TABLE XII

DEMOGRAPHIC CHARACTERISTICS OF NORTHCENTRAL REGION

	AGE					
NUMBER OF CHILDREN	15	16	17	18	19	TOTAL
NONE	26	23	18	17	23	107
ONE	0	1	3	3	15	22
TWO	0	0	0	0	0	0
TOTAL	26	24	21	20	38	129

	RACE				
	WHITE	BLACK	INDIAN	OTHER	TOTAL
NONE	98	4	5	0	107
ONE	21	1	0	0	22
TWO	0	0	0	0	0
TOTAL	119	5	5	0	129

	MARITAL STATUS					
	MARRIED	DIVORCED	WIDOWED	SEP.	SINGLE	TOTAL
NONE	31	1	0	0	75	107
ONE	11	0	1	0	10	22
TWO	0	0	0	0	0	0
TOTAL	42	1	1	0	85	129

	YEARS OF SCHOOL COMPLETED								
	<9	9	10	11	12	13	14	15	TOTAL
NONE	4	11	28	20	38	5	1	0	107
ONE	0	0	3	4	10	2	3	0	22
TWO	0	0	0	0	0	0	0	0	0
TOTAL	4	11	31	24	48	7	4	0	129

TABLE XII CONTINUED

NUMBER OF CHILDREN	POVERTY STATUS % OF OFFICIAL POVERTY LINE <75	75 99	100 124	125 149	150 174	174 199	>200	TOTAL
NONE	11	4	4	8	5	10	65	107
ONE	2	2	1	3	3	0	11	22
TWO	0	0	0	0	0	0	0	0
TOTAL	13	6	5	11	8	10	76	129

TABLE XIII

DEMOGRAPHIC CHARACTERISTICS OF URBAN AREAS

AGE

NUMBER OF CHILDREN	15	16	17	18	19	TOTAL
NONE	99	103	85	74	85	446
ONE	3	7	10	16	29	65
TWO	0	0	1	7	7	15
THREE	0	0	0	1	0	1
TOTAL	102	110	96	98	121	527

RACE

	WHITE	BLACK	INDIAN	OTHER	TOTAL
NONE	387	33	24	2	446
ONE	53	6	5	1	65
TWO	10	3	2	0	15
THREE	1	0	0	0	1
TOTAL	451	42	31	3	527

MARITAL STATUS

NUMBER OF CHILDREN	MARRIED	DIVORCED	WIDOWED	SEP	SINGLE	TOTAL
NONE	94	0	1	2	349	446
ONE	36	0	0	0	29	65
TWO	11	0	1	0	3	15
THREE	1	0	0	0	0	1
TOTAL	142	0	2	2	381	527

TABLE XIII CONTINUED

YEARS OF SCHOOL COMPLETED

	7	8	9	10	11	12	13	14	15	TOTAL
NONE	4	11	60	98	105	119	34	15	0	446
ONE	1	1	7	8	15	26	3	3	1	65
TWO	0	3	0	6	4	1	0	1	0	15
THREE	0	0	1	0	0	0	0	0	0	1
TOTAL	5	15	68	112	124	146	37	19	1	527

POVERTY STATUS
% OF OFFICIAL POVERTY LINE

	<75	75 99	100 124	125 149	150 174	175 200	>200	TOTAL
NONE	38	29	22	21	22	18	296	446
ONE	8	5	5	2	10	6	29	65
TWO	5	2	1	2	1	1	3	15
THREE	0	0	0	0	1	0	0	1
TOTAL	51	36	28	25	34	25	328	527

TABLE XIV

DEMOGRAPHIC CHARACTERISTICS OF NORTHEAST REGION

AGE

NUMBER OF CHILDREN	15	16	17	18	19	TOTAL
NONE	32	27	22	29	23	132
ONE	0	2	4	5	10	21
TWO	0	0	1	0	1	2
THREE	0	0	0	0	1	1
TOTAL	32	29	26	34	35	157

RACE

	WHITE	BLACK	INDIAN	OTHER	TOTAL
NONE	115	6	12	0	133
ONE	16	4	1	0	21
TWO	1	0	1	0	2
THREE	0	0	1	0	1
TOTAL	132	10	15	0	157

MARITAL STATUS

	MARRIED	DIVORCED	WIDOWED	SEP	SINGLE	TOTAL
NONE	43	0	0	0	90	133
ONE	10	0	0	1	10	21
TWO	1	0	0	0	1	2
THREE	1	0	0	0	0	1
TOTAL	55	0	0	1	101	157

TABLE XIV CONTINUED

NUMBER OF CHILDREN	YEARS OF SCHOOL COMPLETED 7	8	9	10	11	12	13	14	15	TOTAL
NONE	1	7	8	37	24	51	4	1	0	133
ONE	0	0	2	3	5	7	3	1	0	21
TWO	0	1	0	0	0	1	0	0	0	2
THREE	0	0	0	1	0	0	0	0	0	1
TOTAL	1	8	10	41	29	59	7	2	0	157

	POVERTY STATUS % OF OFFICIAL POVERTY LINE <75	75 99	100 124	125 149	150 174	175 200	>200	TOTAL
NONE	15	7	12	5	11	6	77	133
ONE	2	3	2	2	3	3	6	21
TWO	1	0	1	0	0	0	0	2
THREE	0	0	1	0	0	0	0	1
TOTAL	18	10	16	7	14	9	83	157

TABLE XV

DEMOGRAPHIC CHARACTERISTICS OF SOUTHEAST REGION

AGE

NUMBER OF CHILDREN	15	16	17	18	19	TOTAL
NONE	41	42	29	31	41	184
ONE	0	4	6	6	15	31
TWO	0	1	0	3	3	7
THREE	0	0	0	0	1	1
TOTAL	41	47	35	40	60	223

RACE

	WHITE	BLACK	INDIAN	OTHER	TOTAL
NONE	154	5	24	1	184
ONE	28	1	2	0	31
TWO	6	0	1	0	7
THREE	1	0	0	0	1
TOTAL	189	6	27	1	223

MARITAL STATUS

	MARRIED	DIVORCED	WIDOWED	SEP.	SINGLE	TOTAL
NONE	52	0	0	0	132	184
ONE	17	2	0	0	12	31
TWO	5	1	1	0	0	7
THREE	1	0	0	0	0	1
TOTAL	75	3	1	0	144	223

TABLE XV CONTINUED

YEARS OF SCHOOL COMPLETED

NUMBER OF CHILDREN	<8	8	9	10	11	12	13	14	TOTAL
NONE	1	4	24	46	38	60	10	1	184
ONE	1	0	3	6	8	11	2	0	30
TWO	0	1	0	4	1	1	0	0	7
THREE	0	0	0	0	0	1	0	0	1
TOTAL	2	5	27	56	47	73	12	1	223

POVERTY STATUS
% OF OFFICIAL POVERTY STATUS

	<75	75 99	100 124	125 149	150 174	175 199	>200	TOTAL
NONE	33	12	11	13	9	7	99	184
ONE	5	2	1	3	5	2	13	31
TWO	1	2	0	1	0	1	2	7
THREE	0	0	0	0	0	0	1	1
TOTAL	39	16	12	17	14	10	115	223

TABLE XVI

DEMOGRAPHIC CHARACTERISTICS OF SOUTHWEST REGION

AGE

NUMBER OF CHILDREN	15	16	17	18	19	TOTAL
NONE	29	16	22	32	23	122
ONE	1	3	9	4	11	28
TWO	0	0	0	1	4	5
FOUR	0	0	0	0	1	1
TOTAL	30	19	31	37	39	156

RACE

	WHITE	BLACK	INDIAN	OTHER	TOTAL
NONE	110	3	6	3	122
ONE	23	1	3	1	28
TWO	5	0	0	0	5
FOUR	1	0	0	0	1
TOTAL	139	4	9	4	156

MARITAL STATUS

	MARRIED	DIVORCED	WIDOWED	SEP.	SINGLE	TOTAL
NONE	42	0	0	0	80	122
ONE	11	0	0	1	16	28
TWO	4	0	1	0	0	5
FOUR	1	0	0	0	0	1
TOTAL	58	0	1	1	96	156

TABLE XVI CONTINUED

YEARS OF SCHOOL COMPLETED

NUMBER OF CHILDREN	7	8	9	10	11	12	13	14	15	TOTAL
NONE	1	1	20	25	17	46	8	3	1	122
ONE	0	1	4	2	7	11	2	1	0	28
TWO	0	0	1	0	2	2	0	0	0	5
FOUR	0	0	0	1	0	0	0	0	0	1
TOTAL	1	2	25	28	26	59	10	4	1	156

POVERTY STATUS
% OF OFFICIAL POVERTY LINE

	<75	75 99	100 124	125 149	150 174	175 199	>200	TOTAL
NONE	17	4	8	12	8	10	63	122
ONE	7	4	0	2	4	0	11	28
TWO	1	0	2	0	0	0	2	5
FOUR	0	0	0	0	0	0	1	1
TOTAL	25	8	10	14	12	10	77	156

Source: U.S. BUREAU OF THE CENSUS OF POPULATION AND HOUSING FOR OKLAHOMA, 1980.

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