The Pennsylvania State University

The Graduate School

College of Health and Human Development

THE EFFECTS OF WELFARE ELIGIBILITY AND ABORTION RESTRICTIONS ON THE PREGNANCY DECISIONS OF YOUNG WOMEN

A Dissertation in

Human Development and Family Studies and Demography

by

Samuel W. Sturgeon

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

May 2009

The dissertation of Samuel W. Sturgeon was reviewed and approved* by the following:

David J. Eggeben
Associate Professor of Human Development and Family Studies, Sociology, and Demography
Dissertation Adviser
Co-Chair of Committee

Gordon F. DeJong
Distinguished Professor of Sociology and Demography
Co-Chair of Committee

Micheal J. Rovine
Professor of Human Development

Kathryn Hynes
Assistant Professor of Human Development and Family Studies and Demography

Deborah Graefe
Research Associate, the Population Research Institute

Douglas M. Teti
Professor of Human Development
Professor-in-Charge of HDFS Graduate Program

*Signatures are on file in the Graduate School.

ABSTRACT

Using data on state abortion restrictions, state family formation related welfare policy stringency, and the fertility and pregnancy histories of women from the National Longitudinal Survey of Youth 1997 Cohort (NLSY97), this project examined whether or not state welfare and abortion policies between 1997 and 2004 are related to one another, and whether these polices affect the decisions of young mothers regarding pregnancy and pregnancy resolution. One of the major goals of the 1996 welfare reforms was to reduce non-marital fertility as a means of reducing welfare dependence. However, some groups feared that efforts to limit non-marital fertility would lead to an increase in abortion. Moreover, economic theory suggests that strict welfare and abortion policies may be working at cross purposes with one another. In general, I find that states with more stringent abortion policies tended to adopt more stringent family formation related welfare polices; however, stringent state welfare and abortion policies were only mildly correlated over this time period ($r = 0.11$). Moreover, I find some evidence to suggest that state policy stringency summary scores may be a better means of examining the effects of state policy stringency than estimating the effects of specific individual policies. In general, state welfare and abortion policies did not appear to affect either the likelihood of pregnancy among all of the women in the sample, or the likelihood that the pregnant women in the sample would elect to have an abortion over a live birth. In addition, there was little evidence to suggest that stringent state welfare and abortion polices are working at cross purposes when it comes to women's pregnancy decisions. Overall, the characteristics of the survey sample (e.g. too small, too homogeneous, not representative at the state level, etc.) made it difficult to isolate the effects of state policies on the respondents' pregnancy decisions net of other unmeasured state characteristics, thus making it impossible to assess the effects of these policies with this data.

TABLE OF CONTENTS

List of Tables vi

List of Figures..... ix

Acknowledgements xi

Chapter One: Introduction 1

Chapter Two: Theoretical Background.....10

Rational Choice Theory 10

Ecological Models of Human Development.....17

Measuring State Welfare and Abortion Policy Stringency.....21

General Theoretical Framework and Conclusions.....25

Chapter Three: Literature Review 31

A Brief History of PRWORA 31

State Characteristics Associated with Welfare and Abortion Policy Stringency 34

Trends in Welfare Use, Non-marital Births, Teen Pregnancy and Abortion.....36

The Link between Non-marital Childbearing and Welfare Dependence.....39

Effects of Welfare and Abortion Policies on Pregnancy and Abortion 42

Personal and Family Background Factors Associated With Pregnancy and Abortion.....50

Conclusion 53

Chapter Four: State Welfare and Abortion Policies from January 1997 to December 2004 60

State Policy Data Description and Coding.....60

State Policy Cross Correlations 72

Conclusion 77

Chapter Five: NLSY97 Data Description and Variable Coding 111

Data Collection and Sample Description 113

Dataset Creation 115

Variable Coding 118

Chapter Six: Predictors of Pregnancy 130

Research Questions and Hypotheses 130

Analysis Strategy 135

Results 141

Discussion 153

Chapter Seven: Predictors of Pregnancy Resolution 167

Research Questions and Hypotheses 167

Analysis Strategy 171

Results 176

Discussion 193

Chapter Eight: Conclusion 210

Summary of Findings 210

Theoretical and Methodological Concerns 215

Directions for Future Research 223

Final Thoughts 226

Appendix: Coding Pregnancy Histories and Independent Variables 230

Bibliography 244

LIST OF TABLES

Table 2.1. The Hypothesized Main Effects of Welfare and Abortion Policy on Pregnancy, Abortion and Live Births at the Individual and State Level 29

Table 2.2. The Hypothesized Interaction Effects of Welfare and Abortion Policy on Pregnancy, Abortion and Live Births at the Individual and State Level 30

Table 4.1. States with a Family Cap Policy January 1997 – December 2004 84

Table 4.2. States Where Pregnant Women Were Not Eligible for Welfare Benefits January 1997 December 2004 85

Table 4.3. States with Welfare Benefits Levels below the National Median 1997-2004 86

Table 4.4. Determinants of State Welfare Policy Cut-off Scores 87

Table 4.5. States with Limited Public Funding for Abortion January 1997 – December 2004....88

Table 4.6. States with Parental Involvement Laws January 1997 – December 2004 89

Table 4.7. States with Informed Consent Laws January 1997 – December 2004.....90

Table 4.8. States with Waiting Period Laws January 1997 – December 2004 91

Table 4.9. Determinants of State Abortion Policy Cut-off Scores.....92

Table 4.10. Correlations between State Welfare Policies January 1997-December 2004.....93

Table 4.11. Correlations between State Abortion Policies January 1997-December 2004 94

Table 4.12. Correlations between State Welfare and Abortion Policies January 1997- December 2004.....95

Table 4.13. Typologies of State Welfare and Abortion Policies January 1997-December 2004.....96

Table 4.14. Dichotomous Typologies of State Welfare and Abortion Policy January 1997-December 2004 97

Table 4.15. Marginal Probabilities of Lenient and Stringent State Welfare and Abortion Policies January 1997-December 2004 98

Table 5.1. NLSY97 Interview Schedule and Number of Respondents Interviewed in Waves 1-8 127

Table 5.2. Number of Interviews Completed by the NLSY97 Female Respondents 128

Table 5.3. Demographic Characteristics of the Women in the NSLY97 (N = 4,385) 129

Table 6.1. Correlations between Measures of Time (N = 375,884)....159

Table 6.2. Odds Ratios for the Likelihood of Pregnancy: Individual and Family Characteristics....160

Table 6.3. Odds Ratios for the Likelihood of Pregnancy: Trimmed Covariates Model 161

Table 6.4. Odds Ratios for the Likelihood of Pregnancy: Individual State Policy Variables....162

Table 6.5. Odds Ratios for the Likelihood of Pregnancy: Tests of Specific Policy Hypotheses 163

Table 6.6. Odds Ratios for the Likelihood of Pregnancy: Individual State Policy Summary Scores....164

Table 6.7. Odds Ratios for the Likelihood of Pregnancy: State Policy Typologies 165

Table 6.8. Results of Hypotheses on the Effects of State Welfare and Abortion Policies on the Likelihood of Pregnancy....166

Table 7.1. Correlations between Measures of Time (N = 3,181)....200

Table 7.2. Univariate Odds Ratios for the Likelihood of Abortion vs. Live Birth and Miscarriage/ Stillbirth vs. Live Birth....201

Table 7.3. Multivariate Odds Ratios for the Likelihood of Abortion vs. Live Birth and Miscarriage/Stillbirth vs. Live Birth....202

Table 7.4. Odds Ratios for the Likelihood of Abortion vs. Live Birth and Miscarriage/Stillbirth vs. Live Birth: Trimmed Covariates Model 203

Table 7.5. Odds Ratios for the Likelihood of Abortion vs. Live birth: Individual State Policy Variables 204

Table 7.6. Odds Ratios for the Likelihood of Abortion vs. Live Birth: Tests of Specific Hypotheses 205

Table 7.7. Odds Ratios for the Likelihood of Abortion vs. Live Birth: Individual State Policy Summary Scores 206

Table 7.8. Odds Ratios for the Likelihood of Abortion vs. Live Birth: State Policy Typologies 207

Table 7.9. Results of Hypotheses on the Effects of State Welfare and Abortion Policies on the Likelihood of Abortion 208

Table 7.10. Correlations between State Abortion Outcomes and State Welfare Policy Typologies 1997-2004 209

Table 8.1. The Hypothesized and Observed Effects of Welfare and Abortion Policy on Pregnancy and Abortion at the Individual Level 228

Table 8.2. Lives Births per 1,000 Women by 5-Year Age Group, United States, 2004 229

Table A.1. Coding of the Race Variables 239

Table A.2. Non-weighted Variable Means and Distributions 240

LIST OF FIGURES

Figure 2.1. The Pregnancy Decision Tree for a Generalized Rational Choice Model 27

Figure 2.2. General Theoretical Framework for Examining the Effects of Welfare Eligibility and Abortion Restrictions on the Pregnancy Decisions of Young Women.....28

Figure 3.1. Average Number of Welfare Recipients (in millions): USA 1960-2004 54

Figure 3.2. Percent of Births to Unmarried Mothers: USA 1950-2004.....54

Figure 3.3. Percent of Births to Unmarried Mothers by Age of Mother: USA 1950-2004 56

Figure 3.4. Pregnancies per 1,000 Women Ages 15-19: USA 1976-2004 57

Figure 3.5. Abortions per 1,000 Live Births: USA 1970-2004.....58

Figure 3.6. Abortions per 1,000 Live Births by Age Group: USA 2004 59

Figure 4.1. State Family Cap Policies in January 1997 and December 2004 99

Figure 4.2. State Policies Regarding the Welfare Eligibility of Pregnant Women in January 1997 and December 2004 100

Figure 4.3. State Welfare Benefit Levels in January 1997 and December 2004 101

Figure 4.4. State Welfare Policy Stringency in 1997 and December 2004 102

Figure 4.5. State Policies Regarding the Public Funding of Abortion in January 1997 and December 2004 103

Figure 4.6. State Parental Consent and Parental Involvement Policies in January 1997 and December 2004 104

Figure 4.7. State Policies Regarding Informed Consent before an Abortion in January 1997 and December 2004 105

Figure 4.8. State Policies Regarding Waiting Periods Before an Abortion in January 1997 and December 2004 106

Figure 4.9. State Abortion Policy Stringency in January 1997 and December 2004 107

Figure 4.10. Simulated Contingency Table and Correlation between Two State Policies 108

Figure 4.11. State Welfare and Abortion Policy in January 1997 109

Figure 4.12 State Welfare and Abortion Policy in December 2004 110

Figure A.1. Female NLSY97 Respondents Enrolled in School January 1997-December 2004.....243

ACKNOWLEDGEMENTS

First, I would like to thank my wife for her constant love and patient support. I am continually indebted to her for the many ways she brings beauty, peace, and joy into my life and my work. I would also like to thank my two young daughters for their exuberant happiness and the invigorating energy of their hugs and smiles. I also thank my mother and grandfather for setting the example, inspiring this dream, and providing continued support.

I am grateful to Dave Eggebeen, my advisor, for his thoughtful training, guidance and friendship. He is a craftsman of both research and student mentoring and has had a positive influence on my life which extends far beyond scholarly pursuits. I thank him for helping me to strike the right balance between personal and professional demands, desires, and opportunities.

I am also grateful to Gordon DeJong. Few people are as passionate or persistent about demographic research and training as he is, and I am grateful for his kind and consistent encouragement. I thank him for helping me see past my self-imposed limits, continually pushing me to reach higher, and also granting me the opportunities to do so.

I would also like to thank the other members of my committee for their support and assistance. Deb Graefe strives for excellence in everything that she theorizes, writes, analyzes—or ever works on or pursues. I am grateful that she always demanded the same from me. Mike Rovine is perhaps the most patient, accessible, and gifted instructor of research methodology. I am grateful for his many consultations and the confidence he has instilled within me. Kathryn Hynes is a very talented and accomplished young professor. As an aspiring young researcher myself, I thank her for showing me through her example how to be a professional scholar.

I would also like to thank the faculty and staff in HDFS and at PRI for the many hours of teaching, assisting, and training I received. In particular, I thank Rukmalie Jayakody for helping me recognize early on that my interests lie in public policy and demography. Lastly, I thank the Hintz Family, NICHD, and all the others whose generous funding made this all possible.

CHAPTER ONE: Introduction

Deciding whether to get pregnant, and if pregnant how to resolve a pregnancy, can be two very difficult and very personal decisions. However, in some instances state and federal governments may have a vested interest in influencing these personal pregnancy decisions. State family formation related welfare policies and state abortion policies are two examples of government interventions aimed at shaping pregnancy decisions. Using data on state welfare and abortion policy stringency and data on the fertility and pregnancy histories of women from the National Longitudinal Survey of Youth, 1997 Cohort (NLSY97), this project examines whether or not state welfare and abortion policies are related to one another, and whether these policies affect the decisions of young mothers regarding pregnancy and pregnancy resolution.

One of the major goals of the 1996 Personal Responsibility and Work Opportunities Reconciliation Act (PRWORA, Public Law 104-193) was to reduce non-marital fertility as a means of reducing welfare dependence. This idea was based on a three key assumptions: 1) Out-of-wedlock childbearing was a leading cause of welfare dependence; 2) The previous welfare program made it economically possible for women to have children they otherwise could not afford, including children born out of wedlock; and 3) Making welfare more difficult to obtain would reduce the likelihood of non-marital births and thereby reduce long term welfare dependence (Causes of Poverty, 1996; Haskins, 2006). In order to receive federal welfare funds, each state was required to submit a state welfare plan outlining how they planned to "Establish goals and take action to prevent and reduce the incidence of out-of-wedlock pregnancies, with special emphasis on teenage pregnancies, and establish numerical goals for reducing the illegitimacy ratio of the State" (Public Law 104-193 sec. 402 (a)(1)(A)(v)).

Many politicians and policy analysts agreed that the current welfare program provided incentives for non-marital births and that lowering non-marital births was a worthy goal. However, religious conservatives feared that a strict tightening of welfare eligibility and an emphasis on reducing non-marital births would lead to a greater demand for abortion (Klerman, 1998; Haskins, 2006). As a compromise, the final version of the welfare reform bill granted illegitimacy bonuses totaling $100 million each year to the five states that experienced the largest drop in non-marital births without a subsequent increase in the state abortion rate.

In the original legislation the illegitimacy bonuses were to be granted to the states that had experienced the greatest percentage decline in the absolute number of non-marital births during the most recent two year period, relative to the previous two year period (Public Law 104-193). However, states were disqualified if their abortion rate for the two year period was greater than the state abortion rate for the 1995 fiscal year. Shortly after the bill's passage, many of the states that were experiencing rapid population growth asked that the criterion for the bonuses be changed from a percentage drop in the absolute number of non-marital births to a decrease in the illegitimacy ratio—the number of non-marital births divided by the number of total births. This change was included in the Balanced Budget Act of 1997 (Public Law 105-33), and the first bonuses were awarded in 1999.

States now had an economic incentive to reduce their non-marital birth ratio while not increasing their abortion rate. Moreover, though states had to submit a plan for reducing teen and non-marital births, there were few restrictions placed on how they might use welfare policies to achieve their goals. States could reduce non-marital births by encouraging marriage or drafting policies that discouraged non-marital pregnancies. The 1996 welfare reforms encouraged state legislatures to be creative in their policy making and there is evidence of

significant state variation in welfare laws aimed at promoting traditional family forms and reducing non-marital fertility (Graefe et al., 2006).

Many states tried to lower the non-marital birth ratio by promoting marriage. Because the non-marital birth ratio is calculated as the number of non-marital births divided by the number of total births, states could lower the non-marital birth ratio by increasing marriage rates among unmarried expectant couples and other unmarried couples who were likely to have children together. One advantage of policies dealing with marriage is that they have the potential to lower a state's non-martial birth ratio without having a negative impact on the state's abortion rate.

States could also compete for the illegitimacy bonuses by passing laws which created a disincentive for having a child out of wedlock. Economic theory suggests that policies that raise the cost of non-marital childbearing for poor women will lead to a decrease in non-marital births (Murray, 1984). However, unlike marriage policies, raising the cost of childbearing for poor woman is also likely to increase the odds that these women will elect to have an abortion (Klerman, 1998). Therefore, in order to reduce non-marital births while not increasing the abortion rate, states would also need to place restrictions on abortions. On the other hand, strict abortion policies are theorized to lead to an increase in live births among pregnant women (Levine & Staiger, 2002); leading some to argue that attempting to reduce female headship through restrictions on welfare eligibility, while also placing greater restrictions on women's access to abortion, could be counterproductive as the two policies may work at cross-purposes (Lichter, McLaughlin, & Ribar, 1998).

Generally, welfare policies aimed at reducing non-marital childbearing have had limited effects. In a review of relevant research, Moffit (1992), and later Hoffman and Foster (2000),

conclude that the causal link between welfare policy and fertility decisions is consistent, yet not very strong. Moreover, when examining the effects of specific welfare policies on non-martial childbearing, the results are generally inconclusive (See Dyer & Fairlie, 2004; Horvath-Rose & Peters, 2001; Jagannathan & Camasso, 2003; Joyce et al., 2004; Kearney, 2002; Sabia, 2008). One reason for the generally mixed results may be that the effects of welfare policy are masked by the countervailing effects of abortion policy, though very few studies have examined the relationship between state welfare and abortion policy stringency.

Though research on the relationship between state abortion policies and family formation related welfare policies is limited, there is a small body of circumstantial evidence which suggests that the stringency of the two policies types may be related within states. For example, Graefe et al. (2006) report that in the post welfare reform era states with stringent welfare policies regarding family formation behaviors tended to be those with a high percentage of voters self-identifying as members of the religious right, whereas more lenient states tended to have a high percentage of voters self-identifying as ideologically liberal. On the other hand, Strickland and Wicker (1992) find that states with a high proportion of residents that are religiously conservative tend to have more restrictive abortion policies; while Medoff (2002) reports that state membership in NARAL Pro-Choice America, is a strong predictor of more lenient abortion policy. Moreover, Norrander and Wilcox (1999) report that states with traditionally conservative stances on other social policies tend to pass restrictive abortion laws.

Given that both stringent welfare and stringent abortion policies tend to be favored by states that are more ideologically conservative and lenient welfare and lenient abortion policies tend to be favored by sates that are more ideologically liberal, there is reason to believe that state abortion policies and welfare policies influencing family formation behaviors may be associated.

If the stringency of welfare policies and abortion policies within a state are related, then economic theory would suggest that these policies may be working at cross purposes with regard to women's fertility decisions (Lichter et al., 1998). Moreover, if these policies are working at cross purposes, this may explain why the hypothesized incentive effects of welfare have at best a moderate influence on women's pregnancy decisions.

In order to determine whether state welfare and abortion policies work at cross purposes, one would first need to determine whether or not state family formation related welfare policy stringency is related to state abortion policy stringency. Second, one would need to assess whether state welfare policy stringency and state abortion policy stringency affect the likelihood that women will get pregnant, and among those that are pregnant, the likelihood that they choose abortion over a live birth. Though several researchers have examined the effects of welfare reform policies on fertility and family formation behaviors, few have examined the effects of PRWORA on the pregnancy resolution decisions of young mothers (i.e. whether they choose abortion over a live birth). Moreover, though many have examined the effects of abortion policies on pregnancy resolution decisions, few have accounted for the competing incentive effects of welfare policies. Using data on state welfare and abortion policy stringency and data on the fertility and pregnancy histories of women from the NLSY97 survey, this project examines whether or not state welfare and abortion policies are related, and whether these policies affect the decisions of young mothers regarding pregnancy and pregnancy resolution. Utilizing Bronfenbrenner's ecological model of human development (Bronfenbrenner, 1979) and rational choice theories from the field of economics (Becker, 1991), this project aims to answer the following questions:

1. Do states that adopt stringent family formation related welfare policies also tend to adopt stringent abortion policies?
2. After accounting for personal, familial, and other contextual variables, do state welfare and abortion policies in the era of welfare reform affect the likelihood of pregnancy among a sample of young women?
3. After accounting for personal, familial, and other contextual variables, do state welfare and abortion policies in the era of welfare reform affect how pregnant women choose to resolve a pregnancy, either though live birth or abortion?

This project improves upon previous research in this area in several ways. First, this projects attempts to measure the relationship between state abortion policy stringency and family formation related welfare policy stringency during the era of welfare reform. The project also examines the competing effects of state abortion policies and state welfare policies on the pregnancy decisions of young women. Moreover, much of the previous research on state policies has compared aggregate state rates (e.g. birthrates or abortion rates). Though this approach is useful for testing the overall effectiveness of state policies, it does not allow researchers to examine the individual processes involved in pregnancy decisions. This project utilizes both state level policy data and individual longitudinal data, thus allowing for an examination of multiple levels of influence. Moreover, unlike previous research, which was often limited to either first pregnancies or second and higher order pregnancies, the longitudinal nature of the data allows for a test of the effects of state policy on both first and higher order pregnancies. Perhaps most importantly, unlike previous studies that examined cross-state variation in AFDC benefits, this study utilizes data from young women whose fertility histories

occurred under TANF, the new welfare program implemented under the 1996 welfare reform legislation.

The remaining chapters provide a complete description of the research project. In Chapter Two, I discuss the theoretical framework behind the specific research questions and hypotheses. Most of the research questions and hypothesized relationships are derived from rational choice theory from the field of economics (Becker, 1991) and Bronfenbrenner's ecological model of human development (Bronfenbrenner, 1979). Chapter Two also discusses the theoretical rationale behind alternative methods of coding and estimating the effects of state policy stringency, including the advantages and disadvantages of examining individual state policies and state policy stringency summary scores. I also discuss a general theoretical framework for examining the effects of welfare eligibility and abortion restrictions on the pregnancy decisions of young women

Chapter Three provides a comprehensive review of relevant research literature. In the review, I cover trends in non-marital childbearing, abortion, and welfare participation, and factors associated with state welfare and abortion policy stringency. I also discuss the link between non-marital childbearing and welfare dependence. In addition, I provide a summary of the research on factors associated with young women's pregnancy and pregnancy resolution decisions, with a special emphasis on the effects of state welfare and abortion policies.

Chapter Four provides an in depth examination of state welfare and abortion policies from January 1997 to December 2004. In this chapter, I describe how the data on state policies was collected and coded and I provide a detailed explanation of the creation of a series of state abortion and welfare policy stringency summary scores. In addition, I provide a detailed description of the prevalence of specific state policies and provide a brief summary of the

welfare and abortion policies either in place or adopted by each state between January 1997 and December 2004. I also examine the correlation over time between individual state welfare and abortion policies, as well as the relationship between state welfare and abortion policy stringency summary scores from January 1997 to December 2004.

In Chapter Five, I provide a detailed description of the NLSY97 sample, the methods used in creating two separate datasets for later analyses, and the coding of the dependent and independent variables. In order to examine factors associated with the likelihood of pregnancy, and the likelihood of abortion among those that were pregnant, I utilize data from female respondents who participated in any of the first eight waves of the NLSY97. First I had to generate the complete pregnancy histories for each of the women in the sample. I also had to calculate a series of time varying covariates and merge the data with the NLSY97 restricted geo code file in order to match respondents with the appropriate state policies. Because much of the information in this chapter is rather technical in nature, the more specific aspects of dataset creation and variable coding are included in an accompanying appendix. Chapter Five and the accompanying appendix outline all of the decision rules used for creating the appropriate datasets and for coding all of the independent and dependent variables. The information provided in these two sources should be sufficient for anyone wishing to reproduce the data used in the analyses, or to evaluate the assumptions and decision rules made throughout the research project.

Chapter Six focuses on factors associated with the likelihood of pregnancy among the women in the sample. First, I discuss the analysis strategy and propose several hypotheses regarding the effects of personal, familial and contextual factors on the risk of pregnancy. Next, using a discrete time hazard model with time varying covariates, I estimate the effects of state

welfare and abortion policies on the odds that a woman will get pregnant within a given month, after controlling for personal and family background characteristics. After presenting the results of the analysis, I discuss the significance of the findings.

Chapter Seven is similar to Chapter Six, except that the analysis is limited to pregnant woman and focuses on factors associated with the decision to resolve a pregnancy through live birth or induced abortion. After outlining the analysis strategy and the proposed hypotheses, I use a multinomial logistic regression model to estimate the effects of state welfare and abortion policies on the odds that a woman will chose abortion over live birth, after controlling for personal, family background, and other contextual variables. After presenting the results of the analysis, I discuss the significance of the findings.

In the final chapter, I provide a summary review of the research findings and an overall assessment of the current research project. In this chapter I discuss the interrelationships between the findings from several chapters and the significance of this research as it relates to other public policy issues. I also asses the limitations of the current research project, including internal threats to validity, and discuss directions for future research in this field.

CHAPTER TWO: Theoretical Background

This research project presupposes that state welfare and abortion policies influence the individual pregnancy decisions of young women. Whether or not state policies have an actual impact is an empirical question which I hope to answer in subsequent chapters. In the meantime, based on rational choice models and ecological theories of development, this chapter provides an outline of the theoretical rationale for hypothesizing a policy impact. In addition, in this chapter I discuss the advantages and disadvantages of using individual state policies and state policy stringency summary scores in order to identify the magnitude of the hypothesized effects. I also discuss theoretical reasons for hypothesizing that state welfare and abortion policy stringency may be related, and provide an overarching theoretical framework for the analysis.

Rational Choice Theory

Rational choice is a theoretical perspective based on two basic assumptions about human behavior, which provides the fundamental rationale for public policy making. The first assumption is *methodological individualism*, or the idea that macro-level events or observations can be explained by individual-level behaviors (Wrong, 1997). The second assumption of rational choice theory is *rationality*, or the notion that, when faced with a decision, actors select one of several options based on what is most likely to maximize their individual utility—the perceived benefits of an action based on their individual preferences (Becker, 1991). One of the fundamental assumptions of welfare policy is that changes in policy will affect the individual decisions of members of the target population, thus leading to a greater good at the population

level (Wrong, 1997). In other words, the very act of welfare policy making assumes methodological individualism and rationality of individual choice.

Many of the 1996 welfare reform initiatives were based on the principles of methodological individualism and rationality of individual choice (Kaestner, 1998). As a result, rational choice models provide a useful perspective for evaluating the effectiveness of state welfare and abortion policies. For example, the 1996 welfare legislation granted bonuses to states with the largest reductions in aggregate non-marital birth ratios. In this case, the assumption of methodological individualism implied that changes in population level non-marital birth ratios were a result of the cumulative decisions and behaviors of the individuals in the population. Therefore, one way to examine the effects of state policies on population measures of fertility would be to examine the effects of these policies on the individual fertility decisions of individual members of the population. In addition, in the case of the 1996 welfare reforms it was believed that lowering the incentives and raising the disincentives associated with non-marital childbearing would lead many women to decide against having children out-of-wedlock (Haskins, 2006). In other words, it was believed that potential welfare participants were rational actors whose pregnancy decisions could be shaped by altering the costs of pregnancy and childbearing. For these reasons, rational choice provides a useful theoretical framework for analyzing the effects of state welfare and abortion policy stringency on women's pregnancy decisions.

Figure 2.1 portrays the basic decision tree relating pregnancy and pregnancy resolution decisions. In this model, a woman must first decide whether or not to get pregnant, and once pregnant, she must decide how to resolve the pregnancy. Rational choice theory assumes that, when faced with a decision like pregnancy, actors select the option that maximizes their

individual utility (Becker, 1991). When evaluating which of several options might bring the most individual benefit, actors may evaluate their current resources, information about available options and programs, and the perceived impact the decisions will have on the actors' desired immediate and future ambitions. Moreover, Levine (2002) argues that this information can change at various times during the pregnancy decision process. For example, a young mother may fully intend to have a child and therefore choose to get pregnant; however, upon hearing that her fetus has a genetic abnormality, she may opt to terminate the intended pregnancy.

According to Becker (1991), pregnancy and fertility can be modeled from a marginal-cost and marginal-benefit framework. This suggests that pregnancy and childbirth are associated with a trade-off between the costs and the benefits of the action, and that a woman will only elect to get pregnant or to have a child when the benefits of doing so are greater than the perceived costs. Therefore, the likelihood of pregnancy or childbirth can be altered by either adjusting the costs, the benefits, or both. Actions or events which raise the costs or lower the benefits of pregnancy and childbearing will reduce the likelihood of pregnancy and childbearing; whereas actions or events which lower the costs or raise the benefits of pregnancy and childbearing will increase the likelihood of pregnancy and childbearing.

Table 2.1 portrays the main effects of state welfare and abortion policies on pregnancy, abortion, and childbirth at the individual and state level. Following rational choice theory, effects at the state level are assumed to represent the cumulative effects of many individual choices. Economic theory suggests that providing a cash benefit to poor single women with children lowers the cost of child bearing, and thereby encourages women to have children outside of marriage that they would not normally consider without the guarantee of public assistance (Murray, 1984). A lenient state welfare policy is likely to provide a sense of security

for poor single women, thus fewer women will take steps to avoid pregnancy thereby increasing their likelihood of getting pregnant. Among those women that are pregnant, economic theory suggests that a lenient welfare system will increase their odds of choosing motherhood over abortion. At the state level, a generous welfare policy will raise the non-marital pregnancy rate. However, because women are more likely to choose motherhood over abortion, the expected overall effect would be an increase in the non-marital birthrate with very little change in the overall abortion rate. The exact opposite would be expected of a stringent state welfare policy (see Table 2.1).

State abortion policies may also influence the pregnancy decisions of young women. In many regards, abortion functions economically as "insurance" (Levine & Staiger, 2002). When abortion is difficult to obtain, women tend to reduce their risk of pregnancy (e.g. using a more reliable form of contraception). As outlined in Table 2.1, when abortion policies are restrictive women are less likely to get pregnant. Moreover, among those who are pregnant, when the cost of abortion is high, they are more likely to choose motherhood over abortion. At the state level, when restrictive abortion policies are in place, one would expect to observe a decrease in both the pregnancy rate and the abortion rate. However, the overall non-marital fertility rate is likely to remain the same, as the decrease in pregnancies is likely to be offset by the increase in the proportion of pregnant women choosing motherhood. The opposite is true for a lenient state abortion policy, with one exception. When abortion is readily available, women are more likely to get pregnant and to choose abortion. However, many of the women that conceived only because abortion was available actually opt for motherhood once pregnant. Therefore, lenient state abortion policy tends to increase the overall pregnancy, abortion, and non-marital birth rates (Levine & Staiger, 2002).

Table 2.1 outlines the anticipated main effects for state abortion and welfare policies on pregnancy, abortion, and childbearing according to rational choice economic theories. However, this table assumes that the impacts of abortion policies and welfare policies are independent of one another. If the stringency of welfare and abortion policies within a state are related, then economic theory would suggest that these policies may be working at cross purposes with regard to women's fertility decisions (Lichter et al., 1998). Table 2.2 portrays the anticipated interaction effects of state abortion and welfare policies on pregnancies, births, and abortions, assuming the effects are not independent of one another.

According to micro-economic theory, both stringent welfare and stringent abortion policies should lead to a decrease in the likelihood that women will get pregnant. Therefore, if a state passed both stringent welfare policies and stringent abortion policies, this should drive down the non-marital pregnancy rate, while having a countervailing effect on the likelihood of abortion versus live birth among pregnant women. However, due to the decrease in overall pregnancies, this should lead to a decrease in the overall rate of non-marital pregnancies, abortions, and non-marital births (see Table 2.2).

If a state adopted stringent welfare policies but lenient abortion policies, economic theory would suggest that these policies would have a countervailing effect on the likelihood of pregnancy, resulting in little change in the overall non-marital pregnancy rate. However, both policies would tend to encourage abortions and discourage live births among pregnant women, thereby leading to an overall increase in the state abortion rate and a decrease in the state non-marital fertility rate (see Table 2.2).

If states adopted lenient welfare policies, but stringent abortion policies, the effects on an individual's likelihood of pregnancy and the state non-marital pregnancy rate would again be

countervailing, thus resulting in no change. However, pregnant women would be more likely to choose childbirth over adoption, thereby leading to a decrease in the state abortion rate and an increase in the state non-marital birth rate (see Table 2.2).

If states passed both lenient welfare and lenient abortion policies, this would lower the costs of both abortion and childbearing. This would lead to an increase in the likelihood that a woman gets pregnant, but have little influence on her decision of whether to induce abortion or have a live birth. However, at the state level, one would expect to see an increase in the overall pregnancy rate, abortion rate, and non-marital birthrate.

Taken together, these results would suggest that the pregnancy rate, abortion rate, and non-marital childbearing rate would be highest in states with lenient welfare and lenient abortion policies, and lowest in states with stringent welfare and stringent abortion policies. During the era of welfare reform, states generally became more stringent with regard to overall welfare policies (Haskins, 2001) and overall abortion policies (New, 2007). During this same time period (early 1990s-present) there has been a considerable drop in adolescent pregnancies, adolescent births, and adolescent abortions (Ventura et al., 2006), as well as an overall decrease in abortions for women of all age groups (Strauss et al., 2007). However, overall rates of non-marital pregnancy and childbearing have increased (Martin et al., 2007). Thus, at a national level, the evidence supporting these economic models is mixed.

Though popular among economists and political scientists, the merits of rational choice theory are not universally accepted by sociologists or researchers from other disciplines within the social sciences (Heckathorn, 1997). The major criticisms of rational choice theory center on the assumption that actors make rational choices, or choices which maximize their individual utility. For example, Wrong (1997) argues that rational choice theorists fail to account for the

influence of socialization and human emotion, and that often times people make decisions that are clearly irrational. Moreover, Tilly (1997) argues that rational choice theory has very limited usefulness because it is most often used to evaluate decisions after they are decided, and has rarely predicted future events or decisions with a high level of precision. Goode (1997) counters that, despite distaste for the assumptions of rational choice among some researchers, most social science research inherently assumes that human behavior can be explained by an internal desire to obtain self-serving objectives. Moreover, despite its critics, rational choice theory has become the dominant paradigm for analyzing the effects of pubic policies on individual and population level behaviors. A rational choice perspective has been used to model fertility decisions (Hechter & Kanazawa, 1997), as well as the effects of public policy, especially welfare policy, on women's fertility and family formation behaviors (Bane & Ellwood, 1994; Caudill & Mixon, 2000; Kaestner, 1998).

Despite the wide spread use of rational choice perspectives, they do have some limitations. Tilly (1997) suggests that rational choice models tend to oversimplify complex decisions and assume that actors are always able to realize their preferences. Therefore, final observable behaviors, and not actor's intentions or desires, define an actor's preferences. However, people do not always get what they want, and rational choice theories tend to ignore the constraints placed on some actors and fail to account for people who are unable to realize strong preferences. For example, for most women getting pregnant and resolving a pregnancy is not a single decision, but instead involves a series of difficult decisions. As part of the decision to get pregnant, a woman must first decide whether to have a relationship with a man, whether to have intercourse, and whether to use a reliable form of contraception. However, from a rational choice perspective, one can assume that the decision to get pregnant subsumes all of the prior

decisions that lead to a pregnancy. Therefore, it is assumed that when a woman gets pregnant, she has also chosen to have a relationship with a man, chosen to have intercourse, and elected not to use a reliable form of contraception. In other words, pregnancy is always assumed to be an intentional choice, regardless of all of the intermediary steps that lead to the ultimate decision. One drawback to such a reduction, and also a common criticism of rational choice theory, is that among those who do not get pregnant, we do not know whether this was a result of not having a relationship with a man, not having sex, not using reliable contraception, or an inability to get pregnant. In other words, the model assumes that a lack of pregnancy is also intentional, which may not always be true. Therefore, in reality, rational choice models for pregnancy do not measure factors differentiating those who want to get pregnant from those who do not. Instead, these models measure factors differentiating those who intend to get pregnant and are able to do so, from those who either do not want to get pregnant, or want to get pregnant but are unable to do so. However, without good measures of actors' intentions, from a rational choice framework, final behaviors are the only indication of actor's preferences.

Ecological Models of Human Development

Though the rational choice model typically focuses on the influence of economic incentives on decision making, multiple factors can influence an actor's decisions. Bronfenbrenner's (1979) ecological model of human development provides a useful framework for examining the many factors that may influence young women's decisions to conceive and resolve a pregnancy (see also Corcoran, 1999). According to the ecological model, individual development is shaped by the interaction of one's personal characteristics and his or her environment. Moreover, there are multiple levels of environmental influence ranging from direct

interaction with one's parents to the broad customs, laws, and ideology of one's culture (Bronfenbrenner & Morris, 1998).

Bronfenbrenner (1979) argued that too often individual development is examined without properly accounting for environmental influences. According to Bronfenbrenner, environmental influences can be classified into five nested systems. The first is the microsystem, comprised of the individuals and structures with which an individual directly interacts. This system includes the family, the classroom, day-care centers, and friends. Not only do agents in this system influence an individual's development, an individual can have a direct influence on the development of the agents in this system. The second system, the mesosystem, represents the interaction between microsystems. For example, a child's parents may be well acquainted with the parents of their child's friend, thus shaping the interactions between a child and his friend. The third level of influence is the exosystem. An individual does not play an active role in the exosystem, however, the exosystem indirectly shapes an individual's development by directly influencing agents in the individual's microsystem. For example, if a child's parent has a stressful work environment, the stress experienced by the parent will have an impact on the child's development, regardless of whether or not the child ever visits the parent's workplace. An individual's development is also shaped by the broader social norms, laws, and customs of society, which Bronfenbrenner labeled the macrosystem. In later years, Bronfennbrenner (Bronfenbrenner & Morris, 1998) added the chronosystem, or the impact of time and maturation on individual development and changes in the other systems.

A key aspect of Bronfenbrenner's ecological systems theory is that individual development occurs when an individual's personal characteristics, endowments, and developmental history interact with environmental influences (Bronfenbrenner & Morris, 1998).

Moreover, it is often not the direct effects of these environmental influences, but the interactions between them, that are most important to development. For example, religious involvement has been shown to affect a young woman's pregnancy decisions (Abma et al., 2004). However, the effects of religious participation are even stronger if her parents are also religiously involved, suggesting an interactive effect between family and religious institutions (Meschke, Bartholomae, & Zentall, 2000). Additionally, Bronfennbrenner and Morris (1998) argue that *changes* in environmental systems are also often strong predictors of future events and have a significant influence on the outcomes of individual decisions. For example, a change in family structure has been associated with an increase in the likelihood of pregnancy among young women (Wu & Thomson, 2001).

The work of Bronfenbrenner and others has led to an increase in our understanding of context as an important factor in personal development. After years of social science research, it is clear that ecological factors 'matter.' However, Bronfenbrenner argues that merely recognizing that an individual's environment matters is insufficient. He complained that "in place of too much research 'out of context,' we now have a surfeit of studies on 'context without development'" (Bronfenbrenner, 1986, quoted in Bronfenbrenner & Morris, 1998, p. 994). This is because many research studies merely control for contextual factors, but do not explain any of the causal developmental mechanisms or mediating processes within various contexts that account for the observed outcomes.

Though Bronfenbrenner's ecological systems model provides a useful paradigm for studying and understanding the many possible factors that shape individual development, one drawback of this research perspective is that it requires a large and complex amount of data to fully account for the hypothesized effects of environmental influences. Ideally, researchers

would want to assess the effects of change in several ecological systems and the interactions between the systems as an individual moves through time. However, most research designs do not account for such complex and dynamic systems, primarily because it is difficult and costly to measure them across time (Bronfenbrenner, 1979). Moreover, researchers would also want to measure mediating pathways and mechanisms that explain the relationships between environmental factors and individual outcomes. However, without sound theory and many resources, collecting a rich set of process variables longitudinally can also be difficult, especially in a survey.

Despite these limitations, Franklin (1988), and later Murray (1995), used a modified version of the ecological model to examine the sexual decisions of young women using survey data. In their models, the predictors of sexual behavior and outcomes were grouped into four levels: individual, family, sociocultural, and social structural. Individual level factors are variables that describe the individual characteristics of a respondent, such as age, intelligence, race, education, and personal income. Family level factors include family characteristics that may shape an individual's decision making processes, including household income, family structure, family communication, and mother's education. Sociocultural factors include systems that families or individuals directly participate in that shape their values and belief systems, such as religious institutions. Social structural factors represent the role of larger social institutions and regulations, such as welfare laws and access to abortion providers.

For this study, I plan to use a similar model to that of Franklin (1988) and Murray (1995) in order to examine ecological influences on young women's pregnancy decisions. In particular, I plan to examine the effects of state welfare and abortion policy stringency—a set of social structural factors—on the pregnancy decisions of young women, after accounting for the effects

of other personal and family background characteristics. The theoretical causal process linking state policy to individual decisions is that of rational choice theory, as outlined above. Basically, state welfare and abortion policy will influence the pregnancy decisions of young women by altering the costs of pregnancy, childbearing, and abortion. Admittedly, the other personal and family background variables will serve as controls, as it is beyond the scope of this paper to examine the causal pathways that explain the observed relationships between personal and family background characteristics and young women's fertility decisions.

Measuring State Welfare and Abortion Policy Stringency

This research project focuses on the effects of welfare and abortion policy stringency on young women's pregnancy decisions. In particular, I plan to examine the effects of specific state abortion policies and family-formation related welfare policies. The institution of specific social policies is rarely an end goal for states, but is typically a means for achieving larger goals, such as reducing out-of-wedlock births or abortions. As such, states typically do not pass specific welfare and abortion laws in isolation, but they arise from a fundamental idea or notion about either welfare or abortion. Therefore, specific policies not only mandate procedures and regulations, but they can also serve as a marker for general attitudes and ideas about abortion and welfare held by various state populations, or at least the legislators who represent them. These general attitudes about welfare and abortion may have as large—if not larger—an effect on young women's pregnancy decisions as the specific policies a state has implemented. On the other hand, it is also anticipated that specific policies will have a noticeable effect. Therefore, when considering the effects of state policy stringency it may be helpful to analyze both specific state policies as well as overall state policy stringency.

The evaluation of specific state policies is perhaps the most straightforward. Analysts typically choose a specific policy or set of policies of interest and then try to isolate and measure the direct effects of these policies on desired outcomes. One example is the work of Sabia (2008) who examined the effects of state family cap policies on state pregnancy and abortion rates. In order to isolate the direct effects of family cap policies on population level family formation behaviors the author also controlled state benefit levels and a set of state abortion variables as other state characteristics. The purpose was the isolate the direct effects of family cap policies, net of other policies thought to affect the same outcomes. This technique is very useful for answering questions regarding the direction and magnitude of the effects of specific policies; in other words, "Does the policy work as intended?" In this research project, I plan to examine the individual effects of three family formation related welfare policies and four abortion policies. Chapter Four contains a complete description of the coding of these variables.

Though it is important to understand the effectiveness of specific state policies, it is also possible that states that share similar ideas about the need to reduce non-marital births and abortions may chose different specific policies for achieving these goals. For example, in an attempt to reduce non-marital births one state may choose to institute a family cap while another state may decide that a current pregnancy does not count towards welfare eligibility. Suppose both policies reduced the non-marital birth ratio, an evaluation that compared states that adopted a family cap to states that did not adopt a family cap may mask the effectiveness of the family cap policy, as states with no family cap policy may have achieved similar reductions in non-marital births through other means or policies. Perhaps a better question might be, "Are states that adopt stringent family formation related welfare policies able to reduce non-marital births?"

In order to answer this second question and similar policy questions, it is necessary to create a summary score of state policy stringency that accounts for the variation in specific state policies implemented to achieve the same goals. This may be especially important in the era of welfare reform when states were given latitude to craft individual policies and enacted a wide range of welfare policies, including the over 500 welfare policies recorded in the Urban Institute's Welfare Rules Database (WRD, 2005, discussed in Volden, 2006). Using factor analytic techniques, DeJong et al. (2006) were able to reduce a vast number of state welfare rules and regulations into three main factors, and produced stringency summary scores for each of the states for these three dimensions. Given that state welfare policies are not enacted in isolation but typically arise from fundamental ideas about welfare, and that some states may adopt different policies in order to achieve the same goals, policy stringency summary scores are more likely to accurately describe stringent and lenient states than does the comparison of individual policies. In this research project, I plan to examine the overall effects of state family formation related welfare policy stringency and state abortion policy stringency using a series of state welfare policy stringency summary scores and state abortion policy stringency summary scores. Chapter Four contains a detailed description of the creation and coding of the separate state policy stringency summary scores.

Another main focus of this project is the interaction between state welfare policy stringency and state abortion policy stringency (see Table 2.2). Earlier it was hypothesized that the effectiveness of state welfare policy may be offset by the stringency of state abortion policy, and vice versa. Though research on the relationship between state abortion policies and state family-formation related welfare policies is limited, there are theoretical reasons for believing that state welfare and abortion policy may be related.

One reason that welfare and abortion policies may be related is that the social policies championed by state legislators tend to correspond with the average desires of the constituents in their districts, what Plotnick and Winters (1985) label the median voter model. Several studies suggest that constituent characteristics influence state welfare and abortion policies. Moreover, many of the same constituent characteristics associated with stringent welfare policies are also associated with stringent abortion policies. For example, Graefe et al. (2006) report that in the post welfare reform era states with stringent welfare policies regarding family formation behaviors tended to be those with a high percentage of voters self-identifying as members of the religious right, whereas more lenient states tended to have a high percentage of voters self-identifying as ideologically liberal. On the other hand, Strickland and Wicker (1992) find that states with a high proportion of residents that are religiously conservative tend to have more restrictive abortion policies; while Medoff (2002) reports that state membership in NARAL Pro-Choice America, is a strong predictor of more lenient abortion policy. Moreover, Norrander and Wilcox (1999) report that states with traditionally conservative stances on other social policies tend to pass restrictive abortion laws. Given that both stringent welfare and stringent abortion policies tend to be favored by states that are more ideologically conservative and lenient welfare and lenient abortion policies tend to be favored by sates that are more ideologically liberal, there is reason to believe that state abortion policies and welfare policies influencing family formation behaviors may be associated.

If state abortion and welfare policy stringency are related, then in addition to creating separate state summary scores for welfare and abortion policy stringency, it is also necessary to create a set of interaction summary scores that account for the possible interaction between state welfare and abortion policy stringency. Some researchers have created summary scores for state

policies across a range of welfare services (e.g. Meyers, Gornick, and Peck, 2001), and others have created typologies for state abortion policy (NARAL, 2006), but to my knowledge no state policy typologies have included both welfare and abortion policies. Moreover, others have controlled for the effects of specific abortion policies on specific welfare policies and vice versa (e.g. Levine, 2002; Sabia, 2008). However, I have not found a study that examines the interaction between specific state family-formation related welfare policies and specific state abortion policies, much less the interaction between general state welfare policy stringency and abortion policy stringency. Given the theoretical importance of the creation and assessment of a summary score which accounts for both state welfare and abortion policy stringency, in Chapter Four I examine the relationship between state welfare and abortion policy stringency, describe the creation of a possible set of state welfare and abortion policy interaction terms.

General Theoretical Framework and Conclusions

This study examines the relationship between state welfare and abortion policy stringency and the effects of state welfare and abortion policy stringency on young women's pregnancy decisions. The theoretical rationale guiding the principle research questions and hypotheses for this research are based in rational choice theory and ecological systems theories; while median voter models provide a helpful link between these two theoretical perspectives and explain why state abortion and welfare policies may be related.

Figure 2.2 portrays the overall theoretical framework for examining predictors of young women's pregnancy decisions. At the top of the picture is very simple portrayal of Bronfenbrenner's ecological systems theory. This theory suggests that individual pregnancy resolution decisions can be shaped by the interaction of larger societal forces and cultural norms

with individual and family level processes and attributes. One key macro-level force that effects the pregnancy resolution decision is societal attitudes and cultural norms about pregnancy, childbearing, abortion, and welfare, as indicated by the darker diagonal line. In the lower portion of the diagram, I provide a theoretical explanatory mechanism that outlines how larger cultural norms may have an impact on individual level pregnancy decisions. The first step is based on the median voter theory, and suggests that cultural norms and societal attitudes about pregnancy, childbearing, welfare, and abortion within a state are likely to determine the types of welfare and abortion policies adopted by the state. Next, according to rational choice theory, these specific welfare and abortion policies are likely to affect the marginal costs of pregnancy and childbearing, which in turn will have an impact on an individual's pregnancy decisions.

The purpose of this study is not to test this entire model, but instead to use this theoretical model to asses the effects of specific state welfare and abortion policies on individual pregnancy decisions. The theoretical model suggests that similar societal and cultural level factors influence state abortion and welfare policy stringency; therefore, it is possible that state abortion and welfare policy stringency are related. If state abortion and welfare policy stringency are related, then rational choice theory would suggest that these policies may have countervailing effects on women's pregnancy decisions. I hope to test these final two assumptions, namely that state welfare and abortion policy stringency are related, and that state abortion policy stringency and state welfare policy stringency have an interactive effect on the pregnancy decisions of young women. Before testing these, assumptions, the next chapter provides a review of prior research that on the determinants of individual pregnancy decisions and the effects of state policies on those decisions.

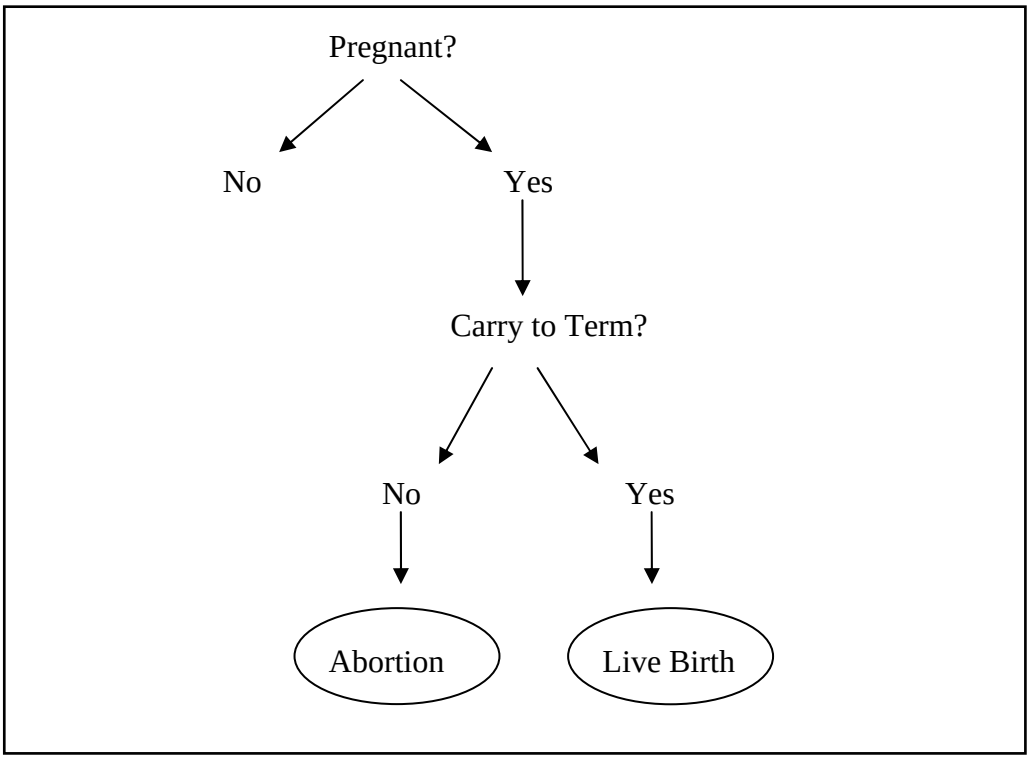


Figure 2.1. The Pregnancy Decision Tree for a Generalized Rational Choice Model.

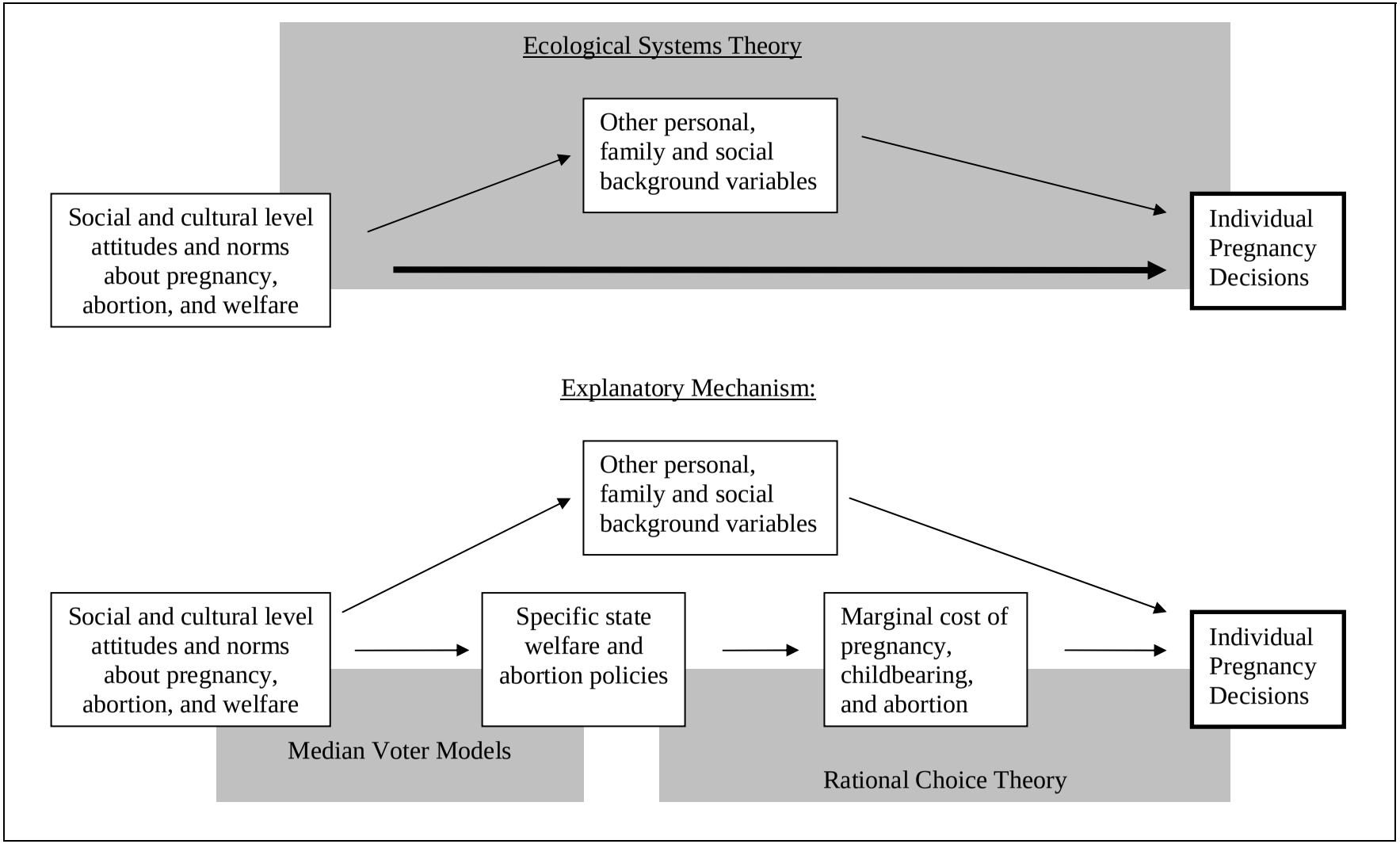


Figure 2.2. General Theoretical Framework for Examining the Effects of Welfare Eligibility and Abortion Restrictions on the Pregnancy Decisions of Young Women.

Table 2.1. The Hypothesized Main Effects of Welfare and Abortion Policy on Pregnancy, Abortion and Live Births at the Individual and State Level.

	Individual Level			State Level		
	Among Those Pregnant					
	Likelihood of Pregnancy	Likelihood of Abortion	Likelihood of Live Birth	Pregnancy Rate	Abortion Rate	Non-Marital Birth Rate
Policy Main Effects:						
Lenient Welfare Policy	up	down	up	up	no effect	up
Stringent Welfare Policy	down	up	down	down	no effect	down
Lenient Abortion Policy	up	up	down	up	up	up*
Stringent Abortion Policy	down	down	up	down	down	no effect

* Research suggests that in the presence of lenient abortion policy, women will be less likely to avoid pregnancy, thus leading to more pregnancies. However, when faced with the decision of abortion, many of these women who would otherwise have avoided pregnancy will choose to keep the child, thus increasing the total number of births and the total number of abortions (Levine & Staiger, 2002).

Table 2.2. The Hypothesized Interaction Effects of Welfare and Abortion Policy on Pregnancy, Abortion and Live Births at the Individual and State Level.

	Individual Level Among Those Pregnant			State Level		
Policy Interaction Effects Welfare/Abortion*	Likelihood of Pregnancy	Likelihood of Abortion	Likelihood of Live Birth	Pregnancy Rate	Abortion Rate	Non-Marital Birth Rate
Stringent/Stringent	down	no effect	no effect	down	down	down
Stringent/Lenient	no effect	up	down	no effect	up	down
Lenient/Stringent	no effect	down	up	no effect	down	up
Lenient/Lenient	up	no effect	no effect	up	up	up

*For the above policy combinations, the first listed is for welfare, and the second is for abortion (e.g., Stringent/Lenient means stringent welfare policy and lenient abortion policy).

CHAPTER THREE: Literature Review

This project examines the effects of state family formation related welfare policies and abortion policies on the pregnancy decisions of young women in the era of welfare reform. In order to provide the context for this study, in this chapter I provide a brief history and rational for the family formation related aspects of the 1996 welfare reforms. I also discuss trends in welfare participation, teen and non-marital pregnancy, and abortion, and state characteristics associated with state welfare and abortion policy stringency. In addition, I provide a brief review of the link between non-marital childbearing and welfare dependence. Finally, I provide a summary of the research on factors associated with young women's pregnancy and pregnancy resolution decisions, with a special emphasis on the effects of state welfare and abortion policies.

A Brief History of PRWORA

In the 1976 Republican presidential primary campaign, Ronald Reagan told the story of a 'welfare queen' who lived illegally off of government largesse (Welfare Queen, 1976). A few years later in his book, *Losing Ground*, Charles Murray claimed that the current welfare system, Aid to Families with Dependent Children (AFDC), provided incentives for young mothers to have children out-of-wedlock. Moreover, Murray argued that non-marital births were the major cause of welfare dependence in America. As a result, he believed that the AFDC program was actually creating more poverty than it was helping to ameliorate. In the coming years, the growing narrative of the welfare queen, coupled with steady increases in teen and non-marital childbearing (Ventura, Mattthews, & Hamilton, 2001; Ventura & Bacharach, 2000), tended to turn public sentiment against the guaranteed cash benefits of AFDC. In the 1992 presidential

elections, Bill Clinton won the presidency in part with a promise to "end welfare as we know it" (Besharov & Fowler, 1993). Moreover, in his 1995 State of the Union Address, President Clinton labeled teen and non-marital childbearing our "most serious social problem" (Executive Office of the President, 1995). Not only was the public clamoring for reforms of the welfare system, many viewed the welfare program as a means of directly reducing teen and non-marital births (Hoffman, 1998; McLanahan, 1994). In a House Subcommittee hearing Congressman Shaw declared, "Out-of wedlock birth is the driving force behind surging welfare caseloads and long-term dependence. Children, mothers, communities, and taxpayers all suffer as a result of welfare policies that subsidize irresponsible and self destructive behavior" (Causes of Poverty, 1996, p. 2).

In response to these viewpoints, members of Congress and the president began work on a welfare reform bill that would primarily encourage work, but also discourage non-marital childbearing (Haskins, 2006). However, some religious groups and others in the pro-life community feared that measures discouraging non-marital births may lead to an increase in abortion. For example, the Conference of Catholic Bishops warned that, "Denying needed benefits for children born to mothers on welfare can hurt the children and pressure their mothers toward abortion and sterilization" (Ricard, 1995, p.564). Throughout the debates over the 1996 welfare reform bill, their was a constant tension between those who wanted to enact strict policies that would discourage non-marital fertility and those who feared that these policies would lead to an increase in abortion (Klerman, 1998); and in fact, these disagreements threatened to kill the bill at various times in the legislative process (Haskins, 2006).

After months of debate, the various Congressional factions and the President reached an agreement, and in August of 1996 President Clinton signed the Personal Responsibility and

Work Opportunity Reconciliation Act (PRWORA). The bill stated that, "it is the sense of the Congress that prevention of out-of-wedlock pregnancy and reduction in out-of-wedlock birth are very important Government interests and the policy contained in [this Act] is intended to address it" (Public Law 104-193 sec. 101 (10)). PRWORA mandated that in order to receive federal welfare funds, each state was required to submit a state welfare plan outlining how they planned to "Establish goals and take action to prevent and reduce the incidence of out-of-wedlock pregnancies, with special emphasis on teenage pregnancies, and establish numerical goals for reducing the illegitimacy ratio of the State" (Public Law 104-193 sec. 402 (a)(1)(A)(v)). Moreover, as a compromise to those who feared an increase in abortion as a result of aggressive state policies, the final version of the welfare reform bill granted illegitimacy bonuses totaling $100 million each year to the five states that experienced the largest drop in non-marital births without a subsequent increase in the state abortion rate.

In the original legislation the illegitimacy bonuses were to be granted to the states that had experienced the greatest percentage decline in the absolute number of non-marital births during the most recent two year period, relative to the previous two year period (Public Law 104-193 sec 403(a)(2)). However, states were disqualified if their abortion rate for the two year period was greater than the state abortion rate for the 1995 fiscal year. Shortly after the bill's passage, many of the states that were experiencing rapid population growth asked that the criterion for the bonuses be changed from a percentage drop in the absolute number of non-marital births to a decrease in the illegitimacy ratio—the number of non-marital births divided by the number of total births. This change was included in the Balanced Budget Act of 1997 (Public Law 105-33), and the first bonuses were awarded in 1999.

States now had an economic incentive to reduce their non-marital birth ratio while not increasing their abortion rate. Moreover, though states had to submit a plan for reducing teen and non-marital births, there were few restrictions placed on how they might use welfare policies to achieve their goals. States could reduce non-marital births by encouraging marriage or drafting policies that discouraged non-marital pregnancies. The 1996 welfare reforms encouraged state legislatures to be creative in their policy making and there is evidence of significant state variation in welfare laws aimed at promoting traditional family forms and reducing non-marital fertility (Graefe et al., 2006).

State Characteristics Associated with Welfare and Abortion Policy Stringency

State policy is not created in a vacuum but is typically the result of a complicated legislative process. Therefore, observed variation in state welfare and abortion policies is likely to also represent related variation in some underlying characteristics of the states, or at least their governments. Moreover, variations in the underlying state characteristics that drive policy may impact individual pregnancy decisions as much as the actual policies themselves. The purpose of this section is not to provide a review of the theoretical mechanisms that guide state social policy (for a detailed review, see Greafe et al., under review), but instead to provide a brief review of some of the underlying characteristics which differentiate states with stringent welfare and abortion policies from states with lenient welfare and abortion policies.

State fiscal and demographic characteristics tend to be associated with social policy stringency. For example, wealthier states tend to provide greater welfare benefit amounts (Peterson & Rom, 1989), whereas states with high poverty rates tend to provide lower benefit amounts (Howard, 1999; Peterson & Rom 1989). State demographics can also contribute to

social policy stringency. States where the minority welfare population is a larger tend to adopt more stringent welfare policies or provide lower benefit amounts (Howard, 1999; Orr, 1976; Plotnick and Winters, 1985; Soss et al., 2001; Wright, 1977; Zylan & Soule, 2000), as do states with a high percentage of out-of-wedlock births (Plotnick and Winters, 1985; Soss et al., 2001). At a minimum, given that the racial composition of the population is associated with social policy, as is the illegitimacy ratio, this suggest that some of the effects of welfare and abortion policy on individual pregnancy decisions may be endogenous with the underlying fertility trends of the population.

Several researchers have found that state welfare and abortion policy stringency are related to variations in the political beliefs and activity of state populations. For example, Graefe et al. (2006) report that in the post welfare reform era states with stringent welfare policies regarding family formation behaviors tended to be those with a high percentage of voters self-identifying as members of the religious right, whereas more lenient states tended to have a high percentage of voters self-identifying as ideologically liberal. Others have found that, in general, more conservative states tend to adopt more stringent welfare policies (Rom, 1999; Soss et al., 2001), and Strickland and Wicker (1992) find that states with a high proportion of residents that are religiously conservative tend to have more restrictive abortion policies. Moreover, Norrander and Wilcox (1999) report that states with traditionally conservative stances on other social policies tended to pass restrictive abortion laws. Aggregate political activity also appears to be associated with state welfare and abortion policies. For example, states with higher rates of electoral participation among low-income voters tend to adopt more liberal welfare policies (Hill, Leighly, & Hinton-Anderson, 1995; Hicks & Swank, 1992; Soss et al., 2001); while state membership in NARAL Pro-Choice America, is a strong predictor of more lenient abortion

policy (Medoff, 2002). Given that both stringent welfare and stringent abortion policies tend to be favored by those that are ideologically conservative and lenient welfare and lenient abortion policies tend to be favored by those that are ideologically liberal, at a minimum there is reason to believe that state abortion policies and welfare policies influencing family formation behaviors may be highly correlated.

Trends in Welfare Use, Non-marital Births, Teen Pregnancy and Abortion

The 1996 welfare reforms were passed in response to concerns about rising welfare caseloads and surging non-marital births. However, some groups feared that restrictions on welfare would lead to an increase in abortion. The following examines trends in welfare use, non-marital fertility, teen pregnancy, and abortion in the decades before welfare reform, through the year 2004, the final year of the data analyzed for this study.

Figure 3.1 portrays the average number of cash assistance welfare recipients in the United States from 1960 to 2004, as reported by the Administration for Children and Families, the federal agency which administers cash assistance welfare programs (ACF, 2008). After steep rises in the late 1960s and early 1970s welfare use tended to level off from the mid 70s to late 80s. During the early 1990s there was a sudden and substantial jump in total welfare caseloads, followed by a substantial decline around the passage of PROWRA in 1996. According to Blank (2001), changes in welfare eligibility and other utilization policies (e.g. the granting of welfare access to minority groups in the 1960s, the expansion of AFDC child only cases in the late 1980s, PWRORA in the late 1990s, etc.), explain many of the long-term macro trends in welfare utilization. PRWORA represented a substantial overhaul of the welfare program and especially welfare eligibility. Therefore, it is not surprising that the 1996 welfare reforms had an

immediate and significant impact on welfare caseloads (Haskins, 2001). Between 1996 and 1998, total welfare caseloads fell by 33%, and it is estimated that roughly 1/3 of this decline was a direct result of the 1996 legislation (CEA, 1999).

In addition to welfare policies, other macro-level factors, especially the economy, appear to be related to trends in welfare use. For example, the roaring national economy of the late 1990s appears to have played a significant role in the dramatic welfare caseload declines of the same period (Blank, 2001; CEA, 1999). Others have found that demographic changes, particularly changes in the proportion of single female headed households, are also related to welfare utilization rates (Blank, 2001; Moffit, 1992).

Though Figure 3.1 portrays the national welfare caseload, it is important to remember that there is significant variation in welfare caseload trends among the states (Blank, 2001), as well as within states (Sturgeon, 2005a). For example, between 1996 and 1998, the federal caseload declined by 33%. However, during this same time period caseloads in Idaho declined by 83%, while caseloads in Nebraska declined by only 4% (CEA, 1999). Much of this variation can be explained by differences in the local economies and in the state welfare policies.

With the exception of a few states in the early 1990s and some additional states after welfare reform, married couples have not been eligible for cash assistance welfare benefits. As a result, non-marital births are believed by many to be a major contributing factor to welfare dependence (Causes of Poverty, 1996). Figure 3.2 displays the percent of all births born to unmarried women in the United States from 1950 until 2004. The percent of children born out-of-wedlock has steadily increased over this time period from 5.3% in 1950 to 35.8% in 2004 (Martin et al., 2006). However, this chart masks significant variation by age. Figure 3.3 portrays the percent of births to unmarried mothers for the same time period, broken into several age

categories. Though the proportion of non-marital births has increased for woman of all ages over this time period, the increase in non-marital births among younger woman has been much greater than for older women. In 2004, less than one in four children born to mothers ages 25 and older was born out-of-wedlock, whereas more than three out of four children born to a teen mother was born out-of-wedlock. However, given differentials in birthrates by age, though almost 80% of teen mothers are single, they account for less than a third of all non-marital births.

Various theories have been postulated to explain the rise in out-of-wedlock births. Furstenberg (1991) argues that this trend is in part due to a relaxing of social norms regarding out-of-wedlock births. There appears to be much less stigma associated with non-marital birth (Edin & Kefalas, 2005), and the proportion of women who marry their partner after the discovery of a premarital conception has fallen considerably since 1950 (Ventura & Bachrach, 2000). Moreover, among the poor, some have argued that childbearing is not longer associated with marriage (Edin & Kefalas, 2005; McLanahan, 2004a; McLanahan 2004b). Others have argued that generous welfare policies create a disincentive for marriage among the poor, thus resulting in more out-of-wedlock births (Aassve, 2003; Causes of Poverty, 1996; Fitzgerald & Ribar, 2004; Murray, 1984). However, others fail to find strong evidence of this effect (Foster & Hoffman, 2001; Klerman, 2005; Moffit, 1992).

In part because of the high proportions of non-marital births among teens, teen pregnancy has been a national priority for several decades (see National Research Council, 1987; Executive Office of the President, 1995). Figure 3.4 displays the teen pregnancy rate in the United States from 1976 to 2004. After peaking around 1991, teen pregnancy rates fell by over a third during the next thirteen years. Though some have claimed the decrease in teen pregnancies is a result of improved pregnancy prevention efforts and access to contraceptives among minors (Kirby,

2001), these same trends have been seen across almost all industrialized nations, suggesting that the phenomenon is more global, and not caused by the specific policies of a single nation (Singh & Darroch, 2000).

A final demographic trend that provides context for this project is the incidence of abortion in the United States. Figure 3.5 displays the ratio of abortions to live births in the United States from 1970 until 2004. The abortion ratio was selected because it represents the likelihood of abortion among pregnant women, regardless of the pregnancy rate. The abortion ratio increased rapidly in the 1970s, especially after the United States Supreme Court upheld the right to an abortion in *Roe v. Wade* in 1973. The abortion ratio remained fairly constant in the 1980s, before beginning a steady decline in the 1990s. The recent declines in abortions are typically attributed to the increased ability of women to reduce unwanted pregnancies (Strauss et al., 2007). At a minimum, these trends suggest that abortions did not increase among pregnant after the 1996 welfare reforms, as feared by several pro-life groups.

Similar to the non-marital birth ratio, the abortion ratio masks significant variation by age of mother. Figure 3.6 portrays the abortion ratio by age group for the United States for the year 2004. Younger pregnant women, especially those under age 15, are significantly more likely to have an abortion than are older pregnant women. Though not shown here, differences in the abortion ratio by age group are similar across time (Strauss et al., 2007).

The Link between Non-marital Childbearing and Welfare Dependence

Many of the family formation related welfare reform policies of the 1990s were instituted based on the assumption that non-marital childbearing and single female headed households were closely linked with poverty and welfare dependence (Causes of Poverty). In this section I

examine the evidence behind the perceived link between having a child out-of-wedlock and later joining the welfare rolls. Questions of whether or not welfare policies increase one's odds of non-marital childbearing are reserved for the following section on the effects of welfare and abortion policies on pregnancy decisions.

One reason that non-marital childbearing and female headship has been associated with welfare dependence is that for many years, married mothers were often ineligible for welfare assistance (Blank, 2001). Moreover, in general single mothers tend to have greater financial needs than do married mothers, and single female headed families are about five times more likely to be in poverty than are married couple families (Proctor & Dalaker, 2003).

Financial hardship seems to be especially problematic for very young mothers. Roughly 80% of children born to teen mothers are born out of wedlock (Martin et al., 2006), and poverty tends to be concentrated in single parent families started by young mothers (Proctor & Dalaker, 2003). Moreover, 60% of teen mothers are living below the poverty line (Maynard, 1995) and more than half have an income below 50% of the poverty line (Wilcox et al., 1996). In addition, a teen birth is often considered the major point of entry for long-term welfare dependence. Though teen mothers themselves account for about 5% of all individual welfare recipients (USGAO, 1994), at any given moment 55% of all welfare families are headed by single women who had first given birth as a teen (Wilcox, et al., 1996), and upwards of 80% of teen mothers will turn to public welfare at some point following the birth of their child[1] (Maynard, 1995).

Much of the income disparity between teen mothers and women that delay childbearing

[1] Many of the statistics reported here reflect cohorts of teens that bore children before the implementation of welfare reform in 1996. Post-welfare reform, a smaller proportion of teens are receiving cash assistance than in the past, however, once additional sources of aid are included (Food Stamps, Medical Assistance, etc.) a higher proportion of teen mothers are actually receiving some form of public assistance post-reform when compared to teen mothers in pre-reform years (Acs & Koball, 2003). Moreover, welfare use post-TANF has deceased significantly among all populations. However, the proportion of the welfare caseload consisting of families started by teen births has remained remarkably constant over the past 30 years (USGAO, 1994; Sturgeon, 2005b, calculations based on the Current Population Survey).

is related to educational attainment. Almost 60% of pregnant school-age teens drop out of school at some point between the eighth and twelfth grade (Manlove, 1998) and young motherhood is associated with reduced educational attainment and, therefore, reduced employment prospects for young mothers (Maynard, 1995). In one study, Foster, Jones, and Hoffman (1998) compared teen mothers to single mothers that bore children in their 20s. Though they found that these women were similar to each other in their economic characteristics—both were fairly disadvantaged relative to married mothers—older mothers that first bore children as teens were worse off than older single mothers that waited until their 20s to bear children. Though single motherhood was harmful to a women's economic well-being, having a non-marital birth as a teen was even more damaging. Much of the difference between the two groups of older single mothers could be explained by differences in educational attainment.

If single-female headed families are a major source of poverty, then one might expect that marriage would reduce poverty and welfare use. Recent studies suggest that marriage would ease the financial strain faced by many single mothers and move them off of welfare (McLanahan, 2004a; McKernan & Ratcliffe, 2005; Thomas & Sawhill, 2002; Lichter, Graefe & Brown, 2003). On the other hand, relationship dissolution is one of the leading causes of welfare entry among poor mothers (Harris, 1997; McKernan & Ratcliffe, 2005). In other words, marriage appears to help women recover from the effects of a non-marital birth, as long as they marry soon after birth (Driscoll et al., 1999) and stay married (Lichter, Graefe & Brown, 2003).

Though single motherhood is a strong risk factor for welfare use, women's individual fertility outcomes are not strong predictors of welfare participation. For one, not everyone who qualifies elects to receive benefits. Blank and Ruggles (1996) found that a significant number of eligible, single women choose not to participate in government sponsored welfare programs, and

that of those who do enroll, many stop receiving benefits before their eligibility terminates. This suggests that many unmeasured factors, other than age and marital status of the mother, influence the decision to apply for public assistance. These other factors may weaken the theorized relationships between non-marital fertility rates and welfare expenditures and enrollment rates. Though Blank and Ruggles do find that mother's age is predictive of program participation, and that a significant number of women do leave public assistance programs due to marriage, the authors argue that a woman's education level and number of children are a few of the of the other variables that also seem to have an effect on welfare receipt. Moreover, they argue that the strongest predictor of welfare use is need, as both the non-users and early leavers are more economically advantaged than their peers who experience extended stays on welfare rolls.

In summary, single motherhood is perhaps the strongest risk factor for welfare utilization, and the majority of the welfare caseload consists of families started by single teen mothers. Moreover, of those on welfare, increases in personal earnings and marriage are two of the main reasons women cease receiving public assistance. For these reasons, it does seem logical that reducing non-marital births would lead to a reduction in the welfare caseload (see also Wolfe, Wilson, & Haveman, 2001; Causes of Poverty, 1996); but does the welfare system encourage non-marital births?

Effects of Welfare and Abortion Policies on Pregnancy and Abortion

The main goal of this study is to examine the effects of state welfare and abortion policies on the pregnancy decisions of young women. The following section provides a brief review of the effects of state welfare policies on women's pregnancy decisions, followed by a similar

review of the effects of state abortion policies on these decisions. The final section provides a review of the literature that examines the joint effects of state welfare and abortion policies.

Effects of State Welfare Policies

The majority of research on the effects of welfare policies on women's pregnancy decisions has focused on state benefit amounts, and this research has produced mixed results. Some have found that women in states with higher welfare benefits are more likely to bear children outside of marriage and are less likely to marry (Assave, 2003; Foster & Hoffman, 2001; Leibowitz, Eisen, & Chow, 1986; Matthews, Ribar, & Willhelm, 1997; Moffit, 2001; Plotnick, 1990; Rosenzweig, 1999). On the other hand, others report that welfare generosity is not related to fertility or pregnancy (Acs, 1996; Fairlie & London 1997; Haveman et al., 1997; Wolfe, Wilson, & Haveman, 2001). In a review of relevant research, Moffit (1992), and later Hoffman and Foster (2000), conclude that the causal link between welfare policy and fertility decisions is consistent, yet not very strong; though Moffit (2001; see also Clarke & Strauss, 1998) later argues that controlling for male and female wage rates strengthens the relationship between welfare benefits and female headship rates. Despite these findings, some have found that welfare benefit levels may affect the fertility decisions of older single women, but not those of adolescents (Aasave, 2003; Duncan & Hoffman, 1990; Foster & Hoffman, 2001; Hao & Cherlin, 2004; Hoffman & Foster, 2000; Wilcox et al., 1996).

A second welfare policy thought to influence female fertility decisions is the family cap. In short, a family cap mandates that women who bear additional children while on welfare will receive no additional benefits. Research on the effects of the family cap has also produced mixed results. Some report that the family cap has had limited effect on out of wedlock births (Dyer & Fairlie, 2004; Kearney, 2002), has had no effect on non-Black populations (Jagannathan

& Camasso, 2003), or has not had an independent effect on state level fertility rates (Joyce et al., 2004). On the other hand, others have found that the institution of a family cap lowers birthrates and raises abortion rates among Blacks (Jagannathan & Camasso, 2003) and women with a previous child (Joyce et al., 2004), is associated with a reduction in non-marital births and pregnancies among Black women (Sabia, 2008), and reduces the likelihood of a subsequent births among poor single mothers (Horvath-Rose & Peters, 2001).

In addition to benefit levels and family cap policies, a few states have enacted policies aimed directly at teenage childbearing. One example is the stay-at-home clause that mandates that minor mothers must reside with their parents or in another supervised setting in order to be eligible for cash assistance. Moreover, not only must the teen qualify for assistance, her household must also qualify (Sawhill, 2000). The rationale behind this law was based in part on previous research which suggested that living at home reduces the likelihood of subsequent births among teen mothers, and also improves the educational, economic, and psychological welfare of teen mothers and their children (Gillmore, et al., 1997; Manlove, Mariner, & Papillo, 2000), especially when compared to living with a boyfriend (Manlove, Mariner, & Romano, 1997). However, because this requirement is difficult to implement and monitor, with only a few exceptions, most states have chosen not to strictly enforce this option (Offner, 2003).

Research on the impact of the stay at home clause has produced mixed results. Post TANF, almost three out of four of teen mothers live with their mothers (73.9 percent), and nationwide it does appear that more teen mothers are living at home, but the difference is not statistically significant (Acs & Koball, 2003). The stay at home clause does appear to deter welfare participation among teens (Collins, 2000; Acs & Koball, 2003). However, preliminary studies suggest that the stay-at-home clause may have actually increased the likelihood of

pregnancy among minors (Horvath-Rose & Peters, 2001; Collins, Stevens & Lane, 2000).

In addition to benefit levels, the family cap, and programs for teens, states have passed other family formation related welfare policies, but research on the effectiveness of these policies is limited and the effects tend to be small. For example, Plotnick (1990) found that the eligibility of pregnant woman was associated with increased non-marital fertility among African-American women, but not other races. Moreover, other welfare measures were not associated with increased non-marital fertility for any of the other races. Joyce, Kaestner, and Korenman (2003) tested a general welfare effect to determine if the implementation of TANF had effected non-marital births, but found that TANF had had no effect. In a related study, Korenman, Joyce, Kaestner, and Walper (2006) examined the states that had been granted the 'illegitimacy bonuses' for reducing their non-marital birth ratios under TANF. They found that the declines in non-marital birth ratios were modest and could largely be explained by changes in the racial contributions of the winning states' populations, and were not necessarily the results of any specific welfare policies (see also Dye & Presser, 1999).

Effects of State Abortion Policies

Most of the research looking at the effects of state abortion policy has focused on either the public funding of abortion or parental consent and involvement laws. Moreover, with a few exceptions, most of the research has examined the effects of these policies only on abortion, and not on other measures such as pregnancy or birth.

In 1976, Congress passed the Hyde Amendment, which barred federal funds from being used to pay for abortions. However, states were allowed to cover the costs of abortion with state money, and as a result some states have elected to use public funds to cover abortions, while other states have opted to only pay for abortions with public funds in rare circumstances.

Research on the effects of public funding of abortions consistently demonstrates that the public funding of abortion makes abortion more accessible, and therefore increases abortion rates and the likelihood women will choose to have an abortion (Argys et al., 2000; Blank, George, & London, 1996; Cook, Parnell, Moore & Pagini, 1999; Currie, Nelson, & Cole 1996; Haas-Wilson, 1993, 1997; Levine, Trainor, & Zimmerman, 1995; Lundberg & Plotnick 1990, 1995; Matthews, Ribar, & Willhelm, 1997; Meier et al., 1996; Morgan & Parnell, 2002; New, 2007; Stevens, Register & Sessions, 1992; Tomal 1999, 2001). Moreover, when Medicaid funding for abortions is available, women currently enrolled in Medicaid are much more likely to receive an abortion than women not enrolled in Medicaid (Henshaw & Kost, 1996; Henshaw & Silverman, 1988; Jones, Darroch & Henshaw, 2002). In addition, as predicted by economic theory, Medicaid funding restrictions appear to reduce pregnancy rates (Levine, Trainor, & Zimmerman, 1995) without significantly impacting non-marital birth rates (Haveman et al., 1997; Kane & Staiger 1996; see also Levine & Staiger, 2002).

Parental consent and parental notification laws typically mandate that a minor parent must either notify her parents before receiving an abortion, or receive her parents consent to an abortion before she can obtain one. Economic theory would predict that parental consent and notification would increase the cost of abortion for minors and therefore lead to a decrease in both teen abortions and adolescent pregnancies, without impacting teen birth rates. Research examining the effects of these provisions has produced mixed results. Some have found parental notification and consent laws decrease abortions among minors (Ellertson, 1997; Haas-Wilson 1993; Levine, 2002, 2003; Matthews, Ribar, & Willhelm, 1997; New, 2007; Ohsfeldt & Gohmann, 1994; Tomal, 1999), while others have found these laws to have no observable effect on minors' abortion rates (Blank, George, & London, 1996; Meier et al., 1996). The effect of

these laws on non-marital birthrates is also mixed (Haveman et al., 1997; Levine, 2003; Tomal, 1999).

Two other common state abortion policies are mandatory waiting periods and mandatory informed consent procedures. These policies have not attracted nearly the same amount of attention as the restrictions on public funding or parental involvement laws. However, the small body of research on the effects of waiting periods and informed consent laws suggests that the effects of these policies on women's pregnancy decisions are also mixed (Meier et al., 1996; New, 2008).

Joint Effects of State Welfare and Abortion Policies

Though many studies have examined the effects of welfare policies on pregnancy and childbearing, and others have examined the effects of abortion policies on pregnancy and childbearing, few studies have examined the simultaneous effects of these policies on pregnancy and childbearing. A few exceptions include studies by Levine (2002, 2003), Sabia (2006), and Lundberg and Plotnick (1990, 1995). Levine and Sabia examined the effects of state level welfare and abortion policies on state level pregnancy, abortion, and non-marital birth rates. Levine found that after controlling for state welfare policies, parental involvement laws reduced adolescent pregnancies and abortions, without a subsequent increase in the minor birth rate. These results are consistent with the main effect for stringent abortion policy found in Table 2.1. After controlling for stringent abortion policies, Sabia reported that the family cap, a stringent welfare policy, was associated with a decrease in state non-marital pregnancy rates and birth rates, while having little effect on the abortion rate, consistent with the main effect for stringent welfare policies found in Table 2.1. In both of these studies, after controlling for the effects of one set of policy variables, the main effects for the other policy variables emerged.

The studies by Lundberg and Plotnick (1990, 1995) and Argys, Averett, and Rees (2000) rely on individual data from women in the 1979 cohort of the NLSY. After controlling for whether or not public funding was available for abortion, Argys and colleagues provided some evidence that reducing incremental benefits for an additional child (a form of the family cap) would lead to a decrease in the likelihood of pregnancy and births among unmarried welfare recipients without increasing the likelihood these mothers would seek an abortion. These results are consistent with the main effects for welfare stringency outlined in Table 2.1. The results reported by Lunberg and Plotnick were difficult to interpret. For white adolescents, the availability of public funding for abortion increased the likelihood that these women would seek an abortion. However, these laws were not used to predict the likelihood of pregnancies or births. In addition, differences in state welfare benefit amounts were associated with the likelihood that the teens married their partner before giving birth, but the effect of these policies on pregnancies and abortions was not estimated. The effects for Black women were generally non-significant. Taken together, these results suggest that omitting the influence of state abortion policies may hide the effects of state welfare policies and vice versa, though this hypothesis has never been directly tested.

Another drawback to studies that examine the effects of both welfare and abortion policies is that they rely on data gathered primarily before the era of welfare reform in 1996. For example, Lundberg and Plotnick (1990, 1995) examined data from 1979 through 1986 waves of the NLSY79, while Argys et al. examined state policies from 1979 to 1991 waves of the same survey. Sabia (2006) relies on state level data from 1984-1998, while Levine (2002, 2003) utilizes state level data from 1985-1996. Though there was significant variation in state abortion policies during these years, the only variability in state welfare policies that was tested from the

NLSY79 studies was the benefit amount available to mothers if they had given birth. Moreover, the analysis of welfare variables by Levine and Sabia was limited to a few years of the family cap. In the post welfare reform era, in addition to variation in state abortion policy, there also exists significant state variation in welfare benefit amounts *and* welfare eligibility requirements (DeJong et al., 2006).

Another problem with past studies examining the effects of both state welfare and abortion policies on pregnancies is that they examine either only first pregnancies (Lundberg & Plotnick, 1990; 1995), only the pregnancies of women who already have at least one child (Argys et al., 2000)[2] or state level pregnancy, abortion, and non-marital birth rates (Levine, 2002, 2003; Sabia, 2006). There are logical reasons for separating first pregnancies from women with a higher order pregnancy. For example, one might hypothesize that a family cap policy is likely to affect only the pregnancy decisions of women with at least one child and should have little effect on women considering their first pregnancy. Therefore, when testing the effects of a family cap, it would be logical to limit the sample to women with one or more children. However, in this situation, the inclusion of women considering a first pregnancy may actually provide a stronger test of the independent effect of the family cap, as it would allow researchers to determine if the family cap alone is having the desired effect on the target sample. If the family cap had a significant impact on women considering either a first pregnancy or a second and higher order pregnancy, than the results would suggest that some other state characteristic, and not the family cap policy, is causing a reduction in births among all women. The ability to test this effect is lost when one limits the sample to only second and higher order pregnancies, or

[2] Argys, Averett, and Rees (2000) model the risk of pregnancy and restrict their sample to person years in which a women reports having received Aid to Families with Dependent Children (AFDC). During the years of their study, in most cases, single women were ineligible to receive AFDC unless a child was present in the home. Therefore, the researchers sample is restricted almost entirely to women experiencing a second or higher order pregnancy.

lumps first and subsequent pregnancies together when examining state level data. Previous studies examining the effects of abortion policies *or* welfare policies have compared effect sizes for first pregnancies and higher order pregnancies, however, no study examining both welfare *and* abortion policies has utilized data from both first *and* higher order pregnancies while differentiating the effects for the two groups.

Personal and Family Background Factors Associated With Pregnancy and Abortion

In addition to state welfare and abortion policies, there are many personal and family level variables associated with the decision to get pregnant and resolve a pregnancy. Following the convention of Franklin (1988) and later Murray (1995), the predictors of pregnancy and pregnancy resolution will be grouped into four levels: individual, family, sociocultural, and social structural. Individual level factors are variables that describe the individual characteristics of a respondent, such as age, intelligence, race, education, and personal income. Family level factors include family characteristics that may shape an individual's decision making processes, including household income, family structure, family communication, and mother's education. Sociocultural factors include systems that families or individuals directly participate in that shape their values and belief systems, such as religious institutions. Social structural factors represent the role of larger social institutions and regulations, such as welfare laws and access to abortion providers.

Predictors of Pregnancy

The majority of studies examining the risk factors for pregnancy have utilized samples of unmarried adolescents and this literature is rather extensive (for a comprehensive review see Kirby, Lepore, & Ryan, 2005; Coley & Chase-Lansdale, 1998). The following provides only a

brief review. Common individual level risk factors associated with pregnancy include: race (Ventura, Mathews & Hamilton, 2001; South & Baumer, 2001); age (Ventura et al., 2001); intelligence (Mensch & Kandel, 1992); school enrollment (Upchurch, Lillard & Panis, 2002; Coverdill & Kraft, 1996; Yamaguchi & Kandel, 1987); educational expectations (Plotnick, 1992; Mensch & Kandel, 1992; Manlove, 1998; Upchurch, Lillard & Panis, 2002); religious attitudes and attendance (Manlove et al., 2000); and individual wages and labor force participation (Coverdill & Kraft 1996).

Typical family level risk factors for pregnancy include: mother's age at first birth (Fergusson &Woodward, 2000); mother's employment (Lopoo, 2005); mother's education (South & Baumer, 2001; Lundberg & Plotnick, 1995; Mensch & Kandel, 1992); family structure (Moore & Chase-Lansdale, 2001; Hogan, Sun & Cornwell, 2000; Ellis et al., 2003; Sturgeon, 2008); family income and welfare utilization (Crowder & Teachman, 2004; Driscoll et al., 1999; Upchurch, Lillard and Panis, 2002; Aasave, 2003; Cherlin & Fomby, 2004; Klawitter, Plotnick & Edwards, 2000); parental monitoring (Crosby & Miller, 2002); a family history of physical or sexual abuse (Fitchen, 1995); young women's marital status and residency status (Yamaguchi & Kandel, 1987); and characteristics of young women's romantic partners (Zavodny, 2001; Lindberg et al., 1997; Darroch, Landry, & Oslak, 1999).

The most common sociocultural level variables associated with the risk of pregnancy include religious affiliation (Argys et al., 2000) and characteristics of an individual's school (Upchurch et al., 2002) or neighborhood (Crowder & Teachman, 2004; Hogan & Kitagawa, 1985). Though not as common in the literature, social structural variables associated with the risk of pregnancy often include county unemployment rates (Argys, et al., 2000), local poverty rates (Kirby, Coyle, & Gould, 2001), and state welfare and abortion policies.

Predictors of Pregnancy Resolution

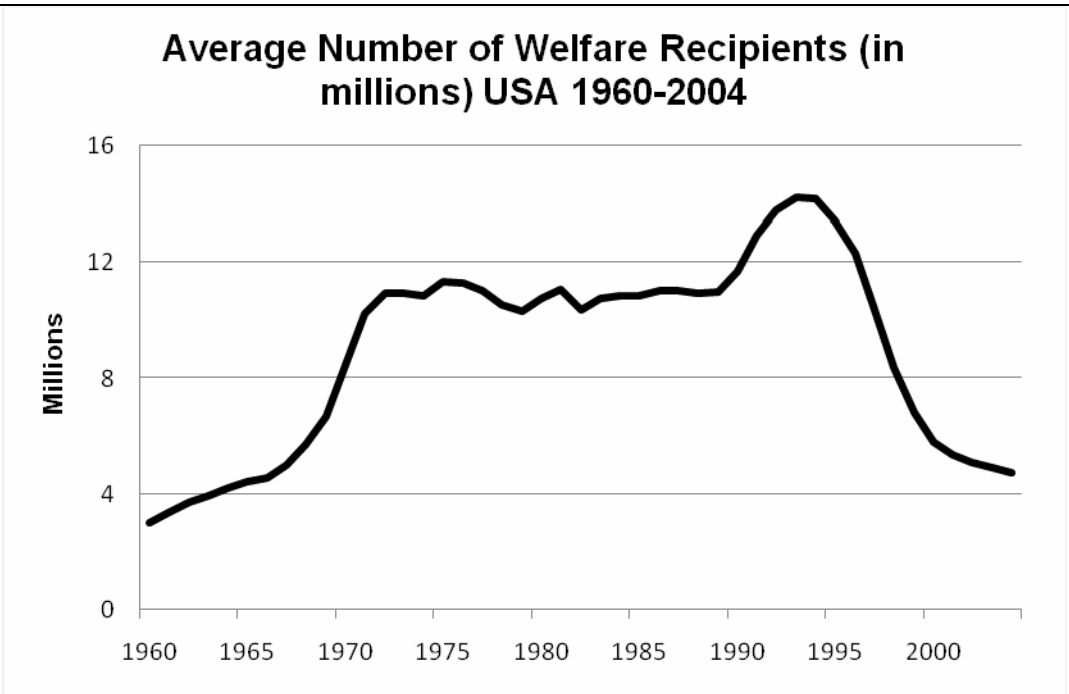
Research on the factors associated with the decision to abort or to carry a pregnancy full term is also rather extensive. Common individual level factors associated with the pregnancy resolution decision include: age and race (Cooksey, 1990; Stevens, Register & Sessions, 1992; Joyce, 1988; Jones, Darroch, Henshaw, 2002); intelligence (Argys et al., 2000; Udry, Kovenock, & Morris, 1996); education (Murry, 1995; Casper, 1990; Stevens et al., 1992); educational expectations (Plotnick, 1992; Mensch & Kandel 1992); school enrollment (Yamaguchi & Kandel, 1987; Leibowitz, Eisen & Chow, 1986; Joyce, 1988); employment (Henshaw & Silverman, 1988); wages (Stevens et al., 1992; Coverdill & Kraft, 1996); abortion and pregnancy history (Joyce, 1988; Henshaw & Kost, 1996); and religiosity (King, Meyers & Bryne, 1992; Stevens et al., 1992).

Common family level factors associated with pregnancy resolution include: family structure, parental education, and mother's employment (South & Baumer, 2001; Murry, 1995; Lundberg & Plotnick, 1995; Mensch & Kandel, 1992; Cooksey, 1990; Udry et al., 1996); family income (Murry, 1995); mother's fertility and abortion history (Evans, 2001); residing with parents at conception (Casper, 1990); young women's marital status (Joyce, 1988; Jones et al., 2002; Stevens et al., 1992; Henshaw & Kost, 1996); and characteristics of young women's romantic partners (Zavodny, 2001; Evans, 2001). One of the few sociocultural variables associated with pregnancy resolution is religious affiliation (Argys et al., 2000; Casper, 1990; Henshaw & Kost, 1996; Henshaw & Silverman, 1988; Murry, 1995). Typical social structural variables associated with pregnancy resolution decisions include access to abortion clinics (Argys et al., 2000; Blank, George & London, 1996; Lichter, McLaughlin & Ribar 1998), residing in a metro area (Henshaw & Kost, 1996; Henshaw & Silverman, 1988), local

unemployment rates (Argys et al., 2000; King et al., 1992; Tomal, 2001) and state welfare and abortion policies as discussed above.

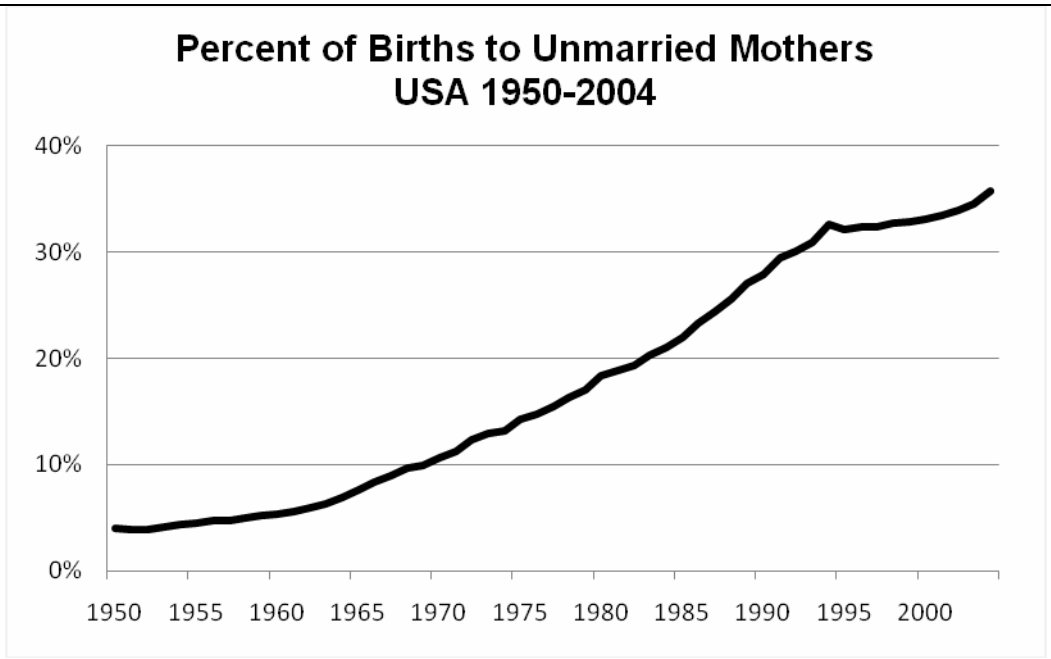
Conclusion

In this chapter I provided a brief history and rational for the family formation related aspects of the 1996 welfare reforms. I also discussed the factors associated with state welfare and abortion policy stringency and discussed trends in welfare participation, non-marital births, teen pregnancy, and abortion. Moreover, I provided a brief review of the link between non-marital childbearing and welfare dependence, and summarized the literature on the effects of these policies on women's pregnancy decisions. Finally, I provided a summary of the research on the personal and family factors associated with young women's pregnancy and pregnancy resolution decisions. Having provided a brief review of the policy context for this study, as well as a short summary of the relevant literature, the next chapter examines the relationship between state family formation related welfare policies and state abortion policies from January 1997 to December 2004.



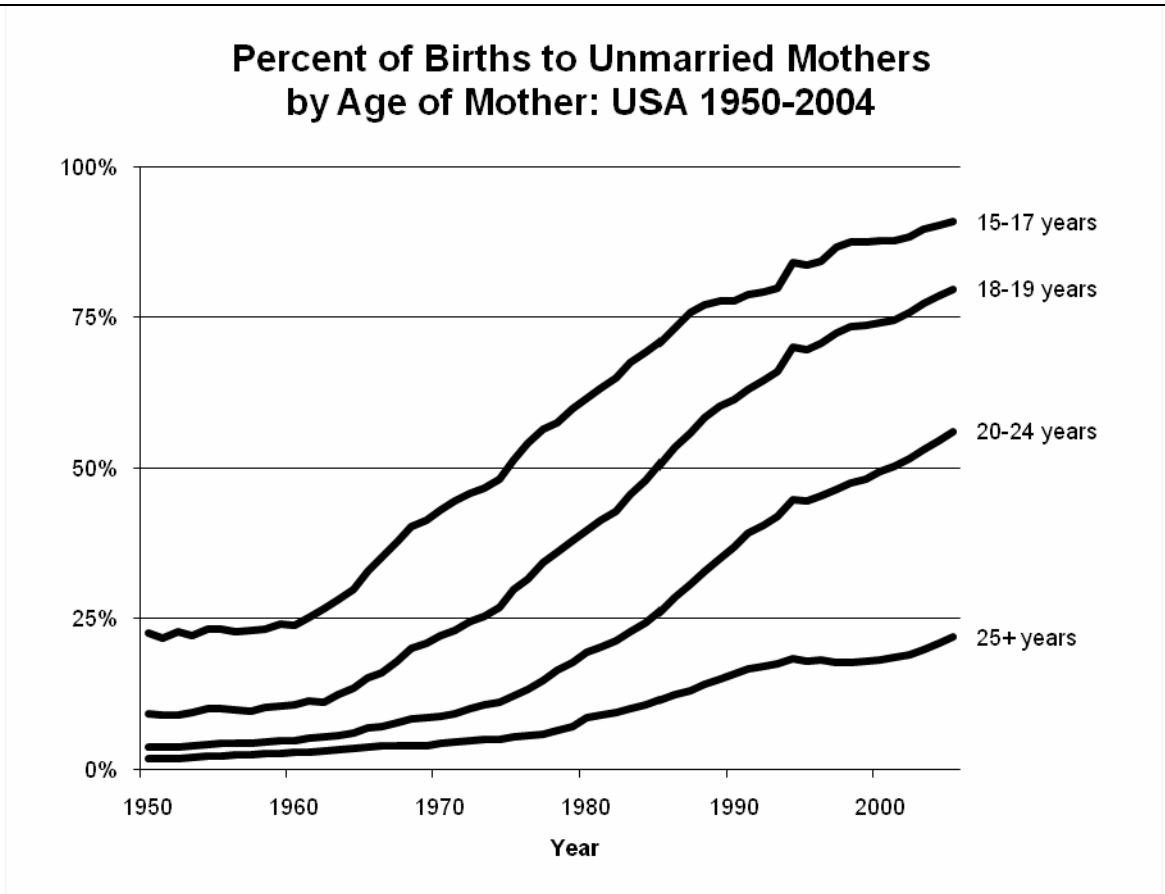
Source: Administration for Children and Familes Caseload Data

Figure 3.1. Average Number of Welfare Recipients (in millions): USA 1960-2004



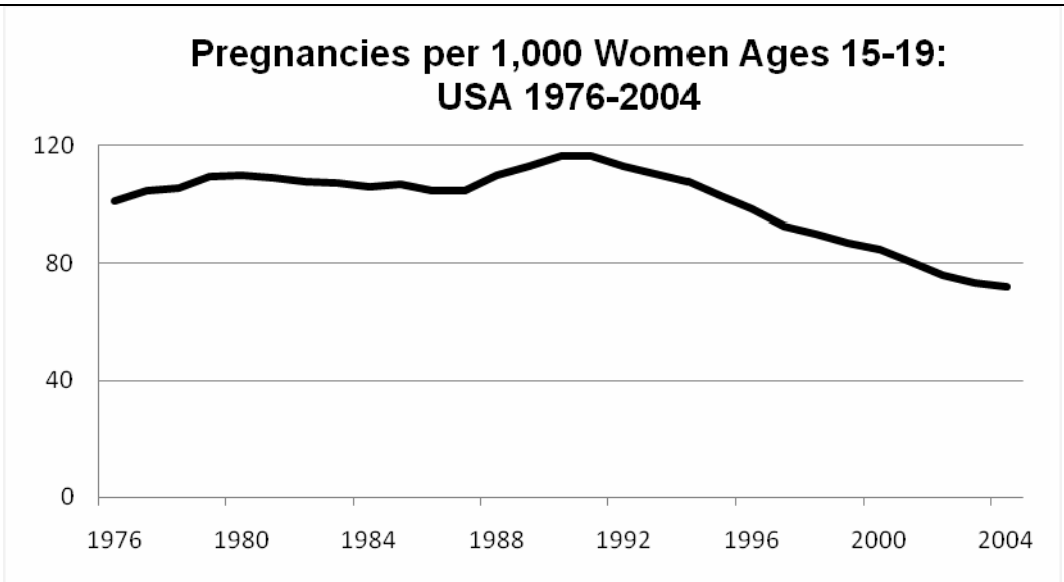
Source: National Vital Statistics Reports

Figure 3.2. Percent of Births to Unmarried Mothers: USA 1950-2004



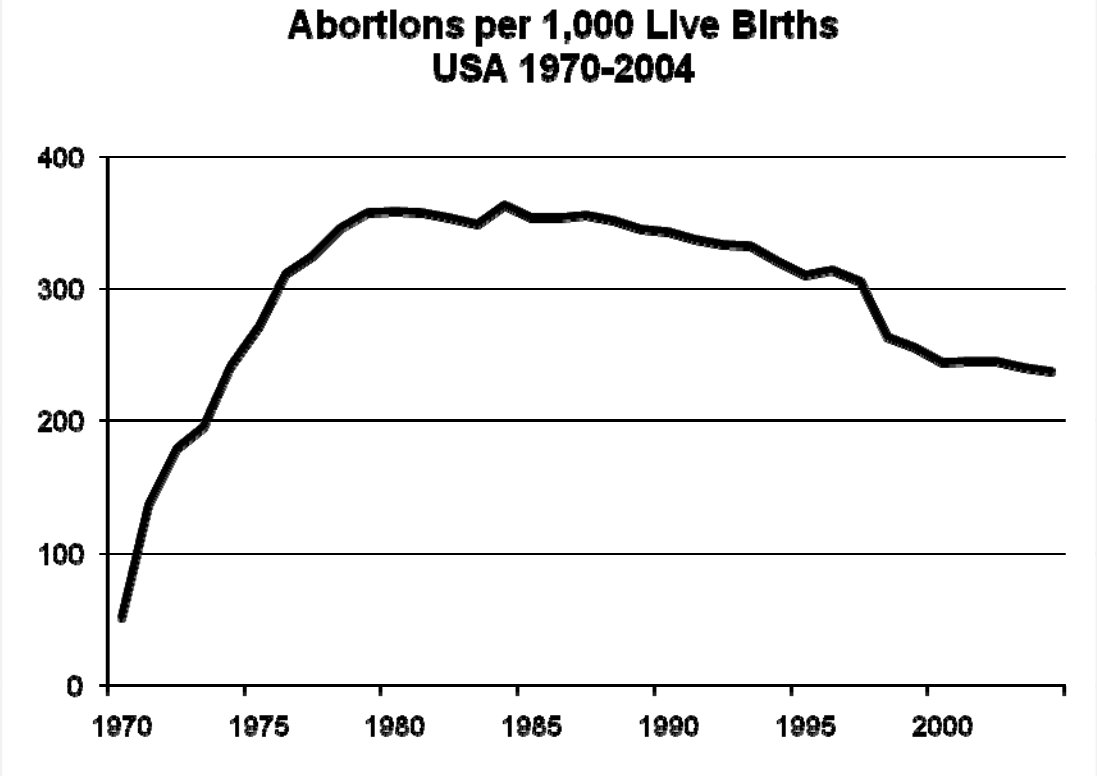
Source: National Vital Statistics Reports

Figure 3.3. Percent of Births to Unmarried Mothers by Age of Mother: USA 1950-2004



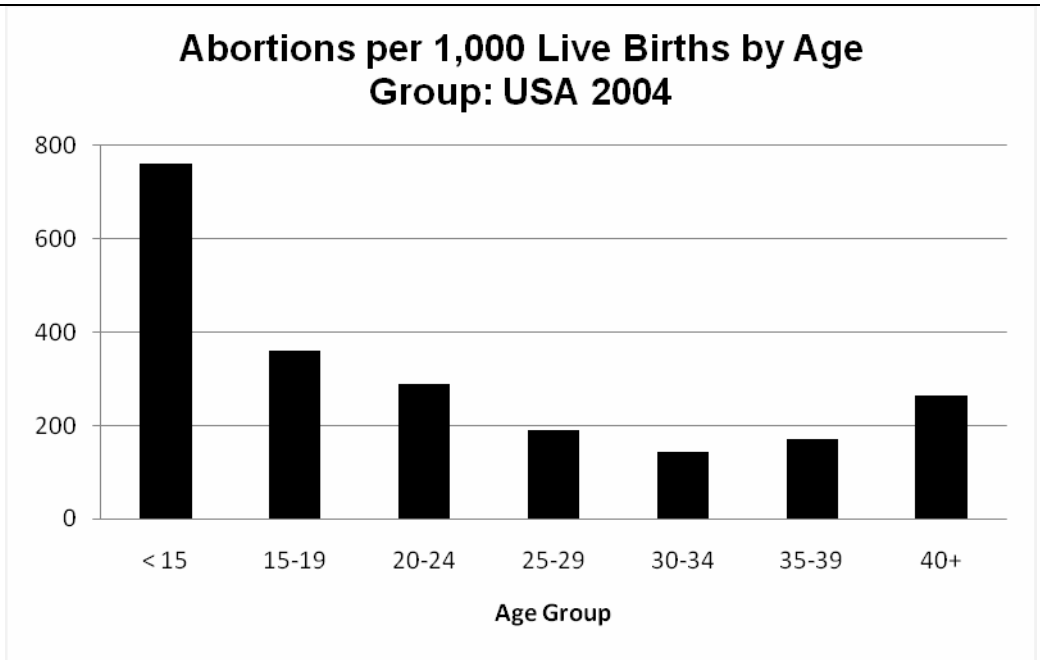
Source: National Vital Statistics Reports

Figure 3.4. Pregnancies per 1,000 Women Ages 15-19: USA 1976-2004



Source: Centers for Disease Control Abortion Surveillance

Figure 3.5. Abortions per 1,000 Live Births: USA 1970-2004



Source: Centers for Disease Control Abortion Surveillance

Figure 3.6. Abortions per 1,000 Live Births by Age Group: USA 2004

CHAPTER FOUR: State Welfare and Abortion Policies from January 1997 to December 2004

Are state family formation related welfare policies and state abortion policies related to one another? In order to answer this question, I utilize monthly state policy data from January 1997 to December 2004. State welfare policies that might impact pregnancy and pregnancy resolution decisions include whether or not a state had instituted a family cap, whether or not pregnant women are eligible for benefits, the month in which pregnant women are eligible for benefits, and the dollar amount of the maximum cash benefit within the state. The abortion variables used in this study include whether states have restrictions on the public funding of abortion, require waiting or counseling before an abortion can be obtained, or require parental consent or notification before a minor can obtain an abortion. The following section provides an in-depth description of the state policy data, examines the correlation between state welfare and abortion policies from January 1997 until December 2004, and creates a typology for defining state policy stringency.

State Policy Data Description and Coding

State Welfare Policy

All of the welfare policy data were obtained from the Urban Institute's Welfare Rules Database (WRD) and are coded in the direction of stringency. For example, a state is coded one in the months that a family cap policy is in place, and zero otherwise. Usually changes in welfare policies occurred on the first of the month. In the few cases where a welfare policy change occurred at another time, the entire month was coded based on the policies in place on the last day of the month.

Family Cap. A family cap policy mandates that women that have an additional child while on welfare will receive no additional cash benefits beyond her current level of receipt. For most states with a family cap policy this means that if a mother enters welfare with two children she will receive a higher benefit than a mother that enters with one child; however, for both of these mothers their benefits would remain the same if they gave birth to an additional child while on welfare. A few states do not have a traditional family cap policy, but instead a default family cap policy where the benefit amount is the same regardless of the number of children that a recipient may have either before enrolling for benefits or while currently enrolled (e.g. Idaho, Wisconsin; WRD, 2007). If welfare benefits provide an incentive for non-marital childbearing, then a family cap policy should decrease the likelihood that women currently on welfare would have a subsequent birth.

Table 4.1 lists the states with a family cap policy between January 1997 and December 2004. Of the 23 states that had a family cap policy during this time period, 17 had enacted the policy in January 1997 or earlier, while all but Minnesota had adopted the policy by July 1998. With the exception of Wisconsin and Illinois, all of the states that had adopted a family cap policy kept the family cap policy through December 2004. Figure 4.1 provides a graphic display of the states that had a family cap policy in place in January 1997 (the first month in our analysis) and December 2004 (the final month in the analysis). States that had adopted a family cap policy by January 1997 were located primarily in the South, along the East Coast, and in the Great Lakes region. States that added a family cap policy by December 2004 were located primarily in the Midwest.

Eligibility of Pregnant Women. For purposes of qualifying to receive a welfare benefit, some states have allowed women to count a current pregnancy as a child. For example, most women do not qualify to receive cash assistance unless they have a child residing with them; however, in some states a woman with no children may apply to receive benefits upon verifying her pregnancy. In states where pregnant women are eligible for benefits, the number of months a recipient must be pregnant in order to be eligible for benefits ranges from the first month of pregnancy to the last trimester (WRD, 2007). However, in this analysis, if a pregnant woman within a state became eligible for benefits at any time before the birth of her child the state was coded as lenient for this policy. Whether or not welfare benefits are available to pregnant women may have an impact on the likelihood of pregnancy and the pregnancy resolution decision.

Table 4.2 contains a list of the states where a current pregnancy could not be used to establish TANF eligibility between January 1997 and December 2004. All of the states with this policy had adopted the policy prior to January 1997, and each state with this policy in January 1997 kept this policy through December 2004. In other words, no state experienced a change in this policy between January 1997 and December 2004. Figure 4.2 provides a map of the states where a current pregnancy could not be used to establish TANF eligibility in January 1997 and December 2004. Every state with this policy is located in the South or the Midwest, with the exception of Wyoming, New Hampshire, and New Jersey. Eleven of the sixteen Southern states and four of the twelve Midwestern states did not consider a current pregnancy when determining welfare eligibility.

Maximum State Benefit Amounts. Some have argued that generous cash assistance welfare programs may encourage non-marital fertility (Murray, 1984). Given variations in state policies and benefit amounts, as well as variation across states in the cost of living, it is difficult to create a measure of state cash assistance that is comparable across states and time. For this analysis, the maximum state benefit amount was calculated using the WRD. Values for 1997-2003 were taken from the Welfare Data Summary Scores (WDSS). However, these data were reverse coded by subtracting each state's amount from the state with the highest raw dollar amount. In this case, in every year this state was Alaska. I put these data back into the original metric by subtracting the adjusted amounts from the original value for Alaska, and then used the same process as used in the WDSS to calculate the amount of money that a family of four with no income would receive for the year 2004. Next, I divided the raw dollar amount of the benefit by the average wages for the state in the same year in order to control for between state differences in cost of living in a given year, as well as within state differences in cost of living across time. Data on average state wages for 1997 through 2004 were taken from the Statistical Abstracts of the U.S. Census Bureau. Finally, I then multiplied these numbers by 100. A value of 25.8 would suggest that the state offered a benefit amount that was equal to 25.8% of the average monthly wage for that state. In order to reverse code these data so that higher values would represent greater stringency, the value for each state in a given year was subtracted from the state with the highest value between 1997 and 2004 (North Dakota in 1998; 46.45). Low values on this variable represent states that pay generous welfare benefits, relative to average wages. High values represent stringent states where the average benefit is small compared to average state wages.

An alternative dichotomous variable was created to designate high and low benefit states. The *Low Benefit* variable is equal to one in the months that a state's calculated maximum benefit amount is less than the median value for all states in that month. Basically, this variable designates which states are in the top half of benefit amounts, and which states are in the lower half of benefit amounts for a given month. Unlike the other policy variables which can change from month to month, these two benefit amount variables are the same for each calendar year, and therefore the only changes in values within a state occur between December and January.

Table 4.3 contains a list of the months between January 1997 and December 2004 in which a state's adjusted maximum benefit amount was below the national median. Most state's scores on the this variable were consistent across the time period, and only Connecticut, Idaho, Maryland, Ohio, Oklahoma, and West Virginia experienced a change in this variable. Figure 4.3 provides a map of the states that that were below the national median in adjusted benefit amounts in January 1997 and December 2004. All of the state in the South, four states in the lower Midwest, five states in the Mountain West, and Connecticut and New Jersey provided below average cash benefit amounts at some point between January 1997 and December 2004.

State Welfare Stringency. As discussed in Chapter Two, the specific welfare policies a state adopts with regard to family formation related behaviors may not be as important as whether or not a state adopted any policies that represent a stringent stance. Between January 1997 and December 2004 some states adopted multiple stringent family formation related welfare policies, while other states adopted none. I wanted to create a set of summary scores that indicated whether a state was generally lenient or stringent on welfare policy for each month between January 1997 and December 2004.

Though many recognize the advantages of evaluating policy summary scores, there is little consensus on the best methods for creating them (McKernan, Bernstein & Fender, 2005). Dejong et al. (2006) used factor analytic techniques, whereas others have grouped policies by related content and summed them to create indices (Fellows and Rowe, 2004; Fender, McKernan & Bernstein, 2002; Soss et al, 2000), or created cut-off points to create state typologies (Rector & Youssef, 1999). Given the lack of consensus, for this research project I created several different welfare policy summary scores. The project focuses on only three family-formation related state welfare policies; therefore, factor analytic techniques were not appropriate, due to the limited number of welfare factors that could potentially emerge. Therefore, similar to Fellows and Rowe (2004) one set of summary scores consisted of the total number of family formation related welfare policies a state had adopted. Values could range from zero (no stringent welfare policies adopted) to three (all stringent welfare policies adopted).

I also wanted to create a dichotomous summary measure that indicated whether a state was generally lenient or stringent on welfare policy for each month between January 1997 and December 2004 (similar to Rector & Yousssef, 1999). To create this variable I added the number of stringent welfare policies (low benefit, eligibility of pregnant women, family cap) that a state had adopted in each month. I then used two criteria for determining the cut-off point that differentiated stringent states from lenient states: 1) the distribution of states by the number of stringent welfare policies adopted; and, 2) the correlation between different cut-off points and the state teen birth rate and non-marital birth ratio. One of the rationales for family formation related welfare policies was a desire to reduce adolescent births and the proportion of births born to un-married mothers. Therefore, I also wanted to determine which policy cut point best differentiated states with high teen birth rates and non-marital birth ratios. Using yearly data

from the National Center for Health Statistics I compiled the teen birth rate and the non-marital birth ratio for each state from 1997 to 2004. I then calculated which policies a state had in place for the majority of months during a specific year in order to create yearly policy variables.

Table 4.4 portrays the two criteria used to determine the cut point for the dichotomous summary measure of state welfare stringency. Separating states with two or more stringent welfare policies from those with zero or one created the most evenly sized groups (60% lenient, 40% stringent). The estimated correlations between the yearly policy scores and the yearly measures of fertility represent the average differences in the teen birthrates and non-marital birth ratios for states on either side of the policy cutoff point. For example, the correlation between the dummy variable indicating states with two or more stringent welfare policies and state teen birth rates was .527. This suggests that on average, states that adopted two or more stringent welfare policies had a teen birthrate .527 standard deviations higher than states that had adopted fewer than two stringent welfare policies. All of the coefficients are positive suggesting that states with higher than average teen birthrates and non-marital birth ratios tended to adopt more stringent family formation related welfare policies, perhaps in an effort to curb these trends. The two policy cutoff score had the highest correlation with both state teen birth rates (r = .527) and state non-marital birth ratios (r = .331). Based on these criteria, states were considered to be stringent welfare states in months when they had adopted two or more stringent welfare policies. Figure 4.4 provides a map of states considered to be stringent welfare states in January 1997 and December 2004. The majority of stringent welfare states were located in the South and the Lower Midwest.

State Abortion Policy

Data on state abortion policies was taken from *Who Decides?*, a yearly report published by NARAL Pro-choice America that provides a summary of the state abortion regulations and the dates they were enacted. The abortion policies examined here include restrictions on the use of public funds to cover most abortions, parental consent and involvement laws regarding abortions among minors, and state mandated waiting periods and informed consent policies before an abortion can be obtained. Similar to the welfare policy variables, the abortion policy variables are coded in the direction of stringency. For example, states are coded one in the months that a mandatory waiting period before receiving an abortion is enforced, and zero otherwise. Unlike the state welfare rules that are changed almost exclusively through a legislative process, state abortion policy is often subject to change due to judicial decree or executive order. Therefore, state abortion policy tends to change more often than state welfare policy, and also tends to change more often in the middle of a month opposed to the first of a month. For this reason, all months were coded based on the abortion policy in place on the last day of each month. Given that future analysis involved using the policies in one month to predict behaviors in the subsequent month, this strategy seemed to produce the least amount of bias.

Public Funding. This variable indicates whether or not a state allowed state funds to be used to cover the costs of abortion for low income women. Most states allow public funds to be used to cover abortions for pregnancies that result from rape or incest, and a majority allow public funds to cover abortions in order to save the life of the mother. However, only about a third of states allow public funds to be used to cover other types of abortions, including elective abortions.

This variable is coded one in months when a state limits the use of public funding for abortion to rare circumstances (typically rape, incest, and life endangerment), and zero in months when a state does not have tight restrictions on the use of public funds for abortion. To the extent that public funding of abortion makes abortion more feasible for lower income individuals, public funding of abortion may increase a woman's likelihood of pregnancy as well as her likelihood of resolving a pregnancy with abortion.

Table 4.5 outlines which states placed strict limits on the use of public funds for the payment of abortion procedures between January 1997 and December 2004. During this time period, 13 states placed no significant restrictions on the use of public funds for abortion, while 30 states had strict restrictions on the public funding of abortion during the entire eight year period. Of the remaining eight states, three states adopted strict requirements prohibiting the use of public funds for abortion procedures (DC, ID, IL), one state dropped its restrictions against the use of public funds (NM), and four states had policies that changed more than once due to judicial mandates or changes in legislation (AK, AZ, IN, TX). Figure 4.5 provides a graphical representation of the states with limited public funding of abortion in January 1997 and December 2004. Most states with lenient restrictions on the public funding of abortion in January 1997 and December 2004 tended to be located either along the Pacific coast or in the Northeast.

Parental Consent and Involvement Laws. Parental involvement laws mandate that before a minor can obtain an abortion she must either notify at least one parent or receive formal consent from at least one parent. Though several states have established judicial bypasses for this requirement, the minor is still required to receive the consent from at least one other adult (either a relative,

counselor, or judge), and typically must establish that it would be unsafe or unreasonable for her to notify a parent of the planned procedure. This variable is coded one in the months that a state has a parental involvement law and zero in the months when they do not have a parental involvement law. To the extent that parental involvement laws increase the costs of obtaining an abortion, these policies may affect the pregnancy and pregnancy resolution decisions of minor women.

Table 4.6 lists the states that enforced a parental involvement law sometime between January 1997 and December 2004. Of the 35 states that enforced a parental involvement law at some point during this time period, 27 states did so for the entire time period. Six states added a parental involvement law during this time period (AZ, CO, SD, TN, TX, VA), while Idaho had its parental involvement law deemed unenforceable in November 2004. Oklahoma introduced a parental involvement law which was enforced for several months, ruled unenforceable for a few months, but later reinstated. Figure 4.6 displays the states that enforced a parental involvement policy in January 1997 and December 2004. More lenient states tended to be located in the West—especially along the Pacific Coast—and in the Northeast, and included four of the five most populous states (CA, NY, FL, IL). States that added parental involvement laws were located largely in the South and Southwest.

Informed Consent Laws. Informed consent laws mandate that before a woman can receive an abortion she must give her informed consent. However, this is typically not limited to discussing the risks of the procedure, as is the norm for most medical procedures; but instead includes a mandate to receive state approved information and counseling before receiving an abortion. These materials might include a discussion of alternatives to abortion and the potential

psychological risks associated with abortion, or a video or pictures of a developing fetus. This variable is coded one in months when a state has an informed consent law and zero in all other months. Requiring women to review state mandated information could potentially effect the pregnancy resolution decisions of expectant mothers.

Table 4.7 provides a list of states with informed consent laws between January 1997 and December 2004. Thirty-two states had an informed consent law at some point during this time period. Of these, 23 enforced these laws during the entire eight year period. Four states added an informed consent law (AZ, TX, WV, WI), while three states discontinued their informed consent laws (FL, MT, TN). In Michigan and Kentucky, the states' informed consent policies changed more than once as a result of court rulings and legislative adjustments. Figure 4.7 portrays the states that enforced informed consent policies in January 1997 and December 2004. For the most part the policies were evenly distributed geographically, with no region containing a disproportionate number of states with lenient or stringent informed consent policies.

Waiting Periods. Waiting period laws mandate that a woman seeking an abortion must wait a designated amount of time after contacting an abortion provider before she can receive an abortion. The required time can be as little as six hours to as long as 48 hours or more. This variable is coded one in months when a state mandates that women wait a designated amount of time before receiving an abortion and zero in months when no waiting period exists. To the extent that a required waiting period raises the costs of an abortion, these policies could affect women's pregnancy resolution decisions.

Table 4.8 lists the states that mandate a woman must wait a specified amount of time before obtaining an abortion for the time period from January 1997 through December 2004.

Twenty-one states enforced a waiting period at some time during this eight year span. Eleven states enforced the waiting period for every month between January 1997 and December 2004, while ten other states added this requirement sometime after January 1997. No state legislatures removed this requirement and no courts ruled these policies unenforceable during this time. Figure 4.8 provides a graphical representation of the states with a waiting period law in January 1997 and December 2004. These policies were adopted primarily by states in the South and the Midwest.

State Abortion Stringency. Similar to the welfare policy scores, I created two sets of state abortion policy summary scores. The first was an additive measure ranging from zero (no stringent abortion policies in place during that month) to four (all possible abortion policies enforced during that month). The second was a dichotomous summary measure that indicated whether a state was generally lenient or stringent on abortion policy for each month between January 1997 and December 2004. I used similar criteria and methodology to determine the number of policies that best differentiates lenient and stringent states; however, instead of state teen birth rates and non-marital birth ratios, I used states abortion rates and abortion ratios (Again taken from the National Center for Health Statistics). Table 4.9 displays the criterion used to determine the appropriate cut point. Separating states with two or more stringent abortion policies from those with zero or one, or states with three or more policies from those with two or less both created a roughly 60/40 split in the number of states in each category. Dividing states with all four stringent abortion policies from states with three or less was most highly correlated with state abortion rates and ratios; however, only 28% of the states had adopted all four abortion policies. The next highest correlations were observed when comparing

states with two or more stringent abortion policies to those with one or zero. Based on these criteria, states were considered to be stringent abortion states in months when they had adopted two or more stringent abortion policies. Figure 4.9 provides a map of states considered to be stringent abortion states in January 1997 and December 2004. During this time, there were far more stringent states than lenient states. The lenient abortion states tended to be located on the Pacific Coast, in the Southwest, and in the Northeast.

State Policy Cross Correlations

To determine whether family formation related state welfare policies and state abortion policies are related to each other overtime, I ran a series of simple correlations. Significance tests are reported in the tables; however, I recorded the policy scores for every state for every month from January 1997 through December 2004 and therefore, any observed relationships represent the actual relationships that exist between the policy variables during this time. In other words, for this analysis I have sampled the entire population of interest.

Because the state policy variables are dichotomous—coded one if a state has a stringent policy in that month and zero otherwise—in addition to the correlation coefficient between two policies, the regression coefficients estimated when using one state policy to predict another are also a useful measure of the strength of the relationship. For simplicity, suppose we recorded the state policy stringency for 50 states during one month. Suppose that half the states were stringent on Policy A and half were stringent on Policy B. Further, suppose that 15 states were stringent on both policies and 15 states were lenient on both policies. Figure 4.10 contains a simulated contingency table demonstrating this relationship. Forty percent of states that are lenient on Policy A are stringent on Policy B (10/25); whereas 60% of states stringent on Policy

A are also stringent on Policy B (15/25). If we graph this relationship (see Figure 8) we see that the mean score on Policy B for those stringent on Policy A is 20 percentage points higher than the mean score on policy B for those lenient on Policy A. This difference is equal to the estimated regression coefficient when using Policy A to Predict Policy B ($\beta = .20$). In other words, the estimated regression coefficient represents the difference in the proportion stringent on Policy B between those stringent and lenient on Policy A.

State Welfare Policies

Table 4.10 displays the correlation coefficients between state welfare policies for the months between January 1997 and December 2004, as well as the regression coefficients when using one policy to predict another for the dichotomous variables (in parentheses). The positive correlations indicate that in general, states stringent on one welfare policy were more likely than states lenient on that policy to be stringent on the other welfare policies. The correlation between family cap policies and the eligibility of pregnant women is .217. When comparing states with a stringent welfare policy regarding the welfare legibility of pregnant women to those states with a lenient policy, there is a 22 percentage point difference in the proportion of states with a stringent family cap policy. Stronger relationships are observed between low benefit states and the other two welfare policies. The proportion of states with a stringent family cap policy or with a stringent policy regarding the eligibility of pregnant women are roughly 40 percentage points greater in states where cash benefit amounts fall below the national median than in states where cash benefit amounts are above the median. The adjusted maximum cash benefit amount is a continuous variable, and therefore the correlations reported in Table 4.10 suggest that on average states with a lenient family cap policy offer cash benefits .355 standard deviations above

the amount offered by states with a stringent family cap policy. Moreover, states where pregnant women are eligible for benefits offer cash benefits .415 standard deviations above the amount offered by states where pregnant women are not eligible for benefits.

State Abortion Policies

Table 4.11 contains the intercorrelations and regression coefficients between state abortion policies for the months between January 1997 and December 2004. In general, states stringent on one abortion policy were more likely than states lenient on that policy to be stringent on the other abortion policies. The strongest correlation was between informed consent policies and waiting period laws (r = .61); while the weakest correlation was between public funding and informed consent laws (r = .21). The remaining correlations between the state abortion policies ranged from .36 to .51.

Are Specific State Welfare and Abortion Policies Correlated?

Having examined in depth family formation related state welfare policies and state abortion policies, I now move to the more critical research question. Are state welfare and abortion policies correlated across time? Table 4.12 contains the cross-correlations and regression estimates between state abortion policies and state welfare policies from January 1997 to December 2004. Correlations between state welfare policies and state abortion policies are mixed. Several policies have no correlation. For example, when comparing states with a stringent family cap policy to those with a lenient family cap policy roughly the same proportions are stringent on the public funding of abortion, parental involvement, informed consent, and waiting period laws. In other words, knowing whether or not a state has a stringent family cap policy does not help us to determine whether or not that state is more stringent than

other states on any of the abortion policies. Similar relationships hold for state mandated waiting periods and informed consent before an abortion can be obtained. Both of these abortion policies are only weakly correlated with any of the family formation related welfare policies, and in some instances the correlations are negative. Negative correlations suggest that states stringent on one of the abortion policies were actually more likely than states lenient on that particular abortion policy to be lenient on one of the welfare policies. For example, when comparing states with a stringent informed consent policy to those states with a lenient informed consent policy, there is a 16 percentage point difference in the proportion of states with a stringent policy regarding the eligibility of pregnant women. However, states with a stringent informed consent policy are more likely to have a lenient policy regarding the eligibility of pregnant women than are states with a lenient informed consent policy.

Though generally state welfare policies are weakly correlated with state abortion policies, there were a few exceptions to this rule. Parental involvement laws and state policies regarding the public funding of abortion were moderately correlated with policies regarding the eligibility of pregnant women. The proportion of states with stringent public funding of abortion or with stringent parental involvement laws was roughly 29 percentage points greater in states where pregnant women were not eligible for welfare benefits than in states where a current pregnancy was counted towards welfare eligibility. Moreover, the public funding of abortion was moderately correlated with both measures of state cash benefit generosity. On average, states with a lenient policy regarding the public funding of abortion offered cash benefits .40 standard deviations above the amount offered by states with a stringent public funding of abortion policy. In addition, the proportion of states with stringent policies regarding the public funding of

abortion was roughly 37 percentage points greater in states where cash benefit amounts fall below the national median than in states where cash benefit amounts are above the median.

Are State Welfare and Abortion Policies Summary Scores Correlated?

Moving beyond the specific policies, are states that were generally stringent on welfare more likely than other states to be generally stringent on abortion? Table 4.13 displays a cross tabulation of the number of welfare and abortion policies adopted by the states for the calendar months between January 1997 and December 2004. In addition to the raw numbers of months, the table also portrays the proportion of total calendar months for each abortion and welfare policy combination, as well as the cut points for lenient and stringent states. The correlation between the number of stringent welfare policies and the number of stringent abortion policies adopted by the states was .115. Table 4.14 displays the cross tabulations between the dichotomous measures of state welfare and abortion policy stringency during the months between January 1997 and December 2004. The most common category was for states to be stringent on abortion policy and lenient on welfare policy. This occurred in just over a third of the total state months (34.4%). In just over half of the state months states were concordant on welfare and abortion stringency with roughly a quarter of states stringent on both welfare and abortion, while another quarter was lenient on both welfare and abortion. The smallest group was the months in which states were lenient on abortion, but stringent on welfare. This group accounted for 13% of the total state months during this time period. Figures 4.11 and 4.12 provide a graphical representation of the state welfare and abortion policy for January 1997 and December 2004, respectively. In both months states lenient on both welfare and abortion tended to be located in the Northeast and along the Pacific Coast, whereas States in the South tended to

be stringent on both welfare and abortion. In the Midwest and Intermountain West, states tended to be stringent on abortion policy, but lenient on welfare policy.

The Pearson correlation between the two dichotomous measures of policy stringency was .105. Though the correlation between state abortion policy stringency and family formation related welfare policy stringency is moderately small, a significant relationship still exists. One way to interpret this coefficient is that it represents the average of the differences in the marginal probabilities. Table 4.15 contains the marginal probabilities of lenient and stringent state welfare and abortion policies. In each set of conditional probabilities, the likelihood that states are concordant on welfare and abortion policy stringency is slightly higher than the probability that the states are discordant on these two policies. Moreover, the average difference in the probabilities within each set of marginal probabilities is approximately .105, the same as the correlation coefficient. Taken together, these results suggest that states are slightly more likely to be concordant than discordant on welfare and abortion policy stringency.

Conclusion

I set out to determine whether or not state family formation related welfare policies and state abortion policies were correlated with each other between January 1997 and December 2004. In general, individual state welfare policies were moderately correlated with one another (Pearson's *r* ranged from .22 to .42). Moreover, individual state abortion policies were also moderately correlated with one another (Pearson's *r* ranged from .21 to .61). This suggests that state social policies are guided by fundamental ideas about welfare and abortion. Therefore, a collection of state policies may represent a better measure of state attitudes about non-martial childbearing and abortion than do specific policies.

In general, individual state welfare policies were weakly correlated with individual state abortion policies during this time period. The three exceptions were: a) the moderate correlation between state policies restricting the use of public funds for abortion procedures and policies restricting the welfare eligibility of pregnant women (r =.29); b) the correlation between state policies restricting the public funding of abortion and states with lower than average benefit levels (r = .37); and, c) the correlation between parental involvement laws and the eligibility of pregnant women (r = .29). I also wanted to determine whether overall state family-formation related welfare policy stringency and overall state abortion policy stringency were related during the era of welfare reform. The state abortion and welfare policy stringency summary scores were mildly related to one another (r = .11). Why were some policies related while others were not?

The disposition of state legislators to spend money on the poor may explain a few of these relationships. In 1976, Congress passed the Hyde Amendment which barred federal funds from being used to pay for abortions. However, states were allowed to cover the costs of abortion with state money. With the passage of TANF in 1996, states were given federal block grants. Though restrictions were placed on the use of federal money, states were required to match federal dollars with state funds, and fewer restrictions were placed on how the state funds were to be utilized (House Committee on Ways and Means, 2004). Because state welfare dollars are fungible, ultimately it was left to the states to decide who would receive welfare funds. Some states may be disinclined to spend money on the poor, whether it be for welfare services or abortion procedures. This may explain the moderate relationships between the three policies that might have a direct impact on state budgets: state policies restricting the use of public funds for abortion, lower than average state welfare benefit levels, and policies restricting the welfare eligibility of pregnant women (if one assumes that states are able to save money by waiting until

a child actually arrives before providing a benefit). The use of public funds is also the only abortion policy which applies primarily to the poor, the same group targeted by welfare reform, which may also explain why it was related to more welfare policies than were the other state abortion laws.

Though economic reasoning seems plausible, especially in the case of state benefit amounts, there is very little evidence that states' desires to save money influence rules regarding the public funding of abortion and the eligibility of pregnant women for cash assistance. For example, Sonfield and Gold (2005) report that the actual cost of state programs to fund abortions for Medicaid recipients are relatively small and only 13% of all abortions are paid for by public funds (Henshaw & Finer, 2003); therefore, prohibiting the use of public funds for abortion does not necessarily lead to large budget savings. Moreover, Greafe et al. (2006) report that state fiscal capacity was not associated with the likelihood that states would allow a pregnancy to count towards welfare eligibility.

Another explanation for the observed moderate relationships between a few state abortion policies and a few state welfare policies may be the fact that state legislators are responding to the desires of their constituents. For example, Graefe and colleagues (2006) report that states with a high proportion of voters identifying themselves as religious conservatives were more likely to be stringent with regard to the welfare eligibility of pregnant women. Moreover, Strickland and Wicker (1992) find that states with a high proportion of residents that are religiously conservative tend to have more restrictive abortion policies, including the passage of parental involvement laws. Therefore it is plausible that a median voter perspective explains the observed moderate relationships between parental involvement laws and the welfare eligibility of pregnant women.

Though the median voter model may explain a few of the observed moderate relationships between specific state welfare and state abortion policies, the median voter model would have suggested that more of the abortion and welfare policies would be related to one another. For example, Norrander and Wilcox (1999) report that states with traditionally conservative stances on other social policies tend to pass restrictive abortion laws. However, with regard to overall family formation-related welfare policy, this was not the case. Why were the other welfare and abortion policies and the state policy stringency summary scores only weakly related to one another? Possible explanations may include dueling priorities within constituents, the role of state and federal courts, and the measurement of state policy stringency, all of which are related.

I argued earlier that state social policies are guided by fundamental ideas about welfare and abortion. Therefore, a collection of state policies may represent a better measure of state attitudes about non-martial childbearing and abortion than do specific policies. Moreover, these fundamental ideas about welfare and abortion may have different salience across the same constituents. For example, the Catholic Church is one of the most strident opponents of abortion, and one of the most strident proponents of traditional families. Therefore, one would have supposed that they would have readily supported both strict abortion policies and welfare policies aimed at reducing non-marital births. However, the Catholic Church feared that policies aimed at reducing non-marital births would lead to an increase in abortion, and therefore they opposed welfare provisions that punished non-marital births, especially the family cap (Haskins, 2006). Instead, the church believed that requiring women to work would make them less likely to bear children out of wedlock, and therefore they favored work requirements as an indirect means of reducing non-marital births. In this analysis, I only examined welfare policies thought

to have a direct impact on the pregnancy decisions of young women. Less than 40% of the states adopted a family cap or placed limits on the welfare eligibility of pregnant women. It is quite possible that many states chose to take a more indirect route towards reducing non-marital births, and this may explain why the welfare policies examined here are only moderately related to state abortion policies.

Another explanation may be the fact that many states were not able to implement the abortion policies they desired. This is because abortion policy is much more likely to be decided by judicial fiat than is welfare policy. For example, of the sixteen states that allowed state funds to be used for abortions in December 2004, only 4 of them did so voluntarily and the other twelve did so as a result of court order (Guttmacher, 2008). For most of the state abortion policies there was a significant difference between the number of states that had actually legislated specific abortion policies, and the number of states that were enforcing them (NARAL, 2005). Therefore, it is possible that the desires of state constituencies regarding abortion and family formation related welfare policies are similar, but that due to the actions of the courts, the actual welfare and abortion policies within a state are not highly correlated[1].

Another reason why the welfare and abortion stringency summary scores may not have correlated highly is the nature of how they were created. For both measures I added the number of specific policies a state had enacted and then categorized the states as either lenient or stringent based on a cut point. One problem with this methodology is that it gives all of the

[1] I performed a separate analysis (not shown) in which I correlated state abortion policies on the books with the family-formation related welfare policies. The correlations were slightly higher than those reported here, but not by much. Moreover, I also found that in some cases, the judicial actions were similar to bills under consideration within a state legislature, and that at the time of judicial fiat, discussion on these particular bills stopped. It is also reasonable that states may not consider legislation that replicates what a court has already mandated. Therefore, I concluded that the laws on the books are also not necessarily an accurate measure of the actual desires of the state. I chose to use the actual policies that are enforced because I wanted to use these measures in subsequent analysis to look at their effect on women's pregnancy decisions, and I assumed that enforced policies were more likely to have an effect on women's behaviors than were unenforced policies.

specific policies equal weight. For example, parental consent laws may not have as large an impact on state abortions as waiting period laws because waiting period laws apply to every woman seeking an abortion, whereas parental consent laws only apply to minors. However, a state with a parental consent law and a restriction on public funding is considered to be equally as stringent on abortion as a state with an informed consent law and a waiting period law. In future analysis, I hope to asses the validity of the current measures by examining the effects of the individual policies and the overall stringency summary scores on the behaviors these policies were intended to influence: young women's pregnancy decisions.

Though state abortion policies and family formation related welfare policies were not as highly correlated as hypothesized, this does not mean that they will not have an interactive effect on the pregnancy decisions of young women. In reality, the fact that these state policies are not highly correlated overtime actually allows for a better test of whether or not their influence on women's pregnancy decisions is counteractive. Had the policies been highly correlated, I would only be able to compare the effects on individual decisions of living in states stringent on both the welfare and the abortion policy domains to living in states that are lenient on both policy domains. However, currently, about a fourth of the states are lenient on both policy domains, one fourth are stringent on both domains, one third have lenient welfare policies and stringent abortion policies, and the remainder have stringent welfare policies and lenient abortion policies (see Table 4.14). Chapter Six looks at the effects of state family formation-related welfare policy stringency and abortion policy stringency on the likelihood a woman will get pregnant, and Chapter Seven looks at the effects these policies have on the pregnancy resolution decisions of the young women who do get pregnant. However, before moving on to the effects of these

policies on individual decisions, Chapter Five provides a detailed description of the individual level data that will be used in subsequent analysis.

Table 4.1. States with a Family Cap Policy January 1997 – December 2004.

State	Months	State	Months
Alabama		Montana	
Alaska		Nebraska	Jan98-Dec04
Arizona	Jan97-Dec04	Nevada	
Arkansas	Jan97-Dec04	New Hampshire	
California	Aug97-Dec04	New Jersey	Jan97-Dec04
Colorado		New Mexico	
Connecticut	Jan97-Dec04	New York	
Delaware	Jan97-Dec04	North Carolina	Jan97-Dec04
District of Columbia		North Dakota	Jul98-Dec04
Florida	Jan97-Dec04	Ohio	
Georgia	Jan97-Dec04	Oklahoma	Nov97-Dec04
Hawaii		Oregon	
Idaho		Pennsylvania	
Illinois	Jan97-Jan04	Rhode Island	
Indiana	Jan97-Dec04	South Carolina	Jan97-Dec04
Iowa		South Dakota	
Kansas		Tennessee	Jan97-Dec04
Kentucky		Texas	
Louisiana		Utah	
Maine		Vermont	
Maryland	Jan97-Dec04	Virginia	Jan97-Dec04
Massachusetts	Jan97-Dec04	Washington	
Michigan		West Virginia	
Minnesota	Jul03-Dec04	Wisconsin	Jan97-Sep97
Mississippi	Jan97-Dec04	Wyoming	Feb97-Dec04
Missouri			

Table 4.2. States Where Pregnant Women Were Not Eligible for Welfare Benefits January 1997-December 2004.

State	Months	State	Months
Alabama	Jan97-Dec04	Montana	
Alaska		Nebraska	
Arizona		Nevada	
Arkansas	Jan97-Dec04	New Hampshire	Jan97-Dec04
California		New Jersey	Jan97-Dec04
Colorado		New Mexico	
Connecticut		New York	
Delaware		North Carolina	Jan97-Dec04
District of Columbia		North Dakota	
Florida		Ohio	
Georgia	Jan97-Dec04	Oklahoma	Jan97-Dec04
Hawaii		Oregon	
Idaho		Pennsylvania	
Illinois		Rhode Island	
Indiana	Jan97-Dec04	South Carolina	Jan97-Dec04
Iowa	Jan97-Dec04	South Dakota	Jan97-Dec04
Kansas		Tennessee	
Kentucky	Jan97-Dec04	Texas	Jan97-Dec04
Louisiana		Utah	
Maine		Vermont	
Maryland		Virginia	Jan97-Dec04
Massachusetts		Washington	
Michigan		West Virginia	Jan97-Dec04
Minnesota		Wisconsin	
Mississippi	Jan97-Dec04	Wyoming	Jan97-Dec04
Missouri	Jan97-Dec04		

Table 4.3. States with Welfare Benefits Levels below the National Median 1997-2004.

State	Years	State	Years
Alabama	1997-2004	Montana	
Alaska		Nebraska	
Arizona	1997-2004	Nevada	1997-2004
Arkansas	1997-2004	New Hampshire	
California		New Jersey	1997-2004
Colorado	1997-2004	New Mexico	
Connecticut	2000-2002; 2004	New York	
Delaware	1997-2004	North Carolina	1997-2004
District of Columbia	1997-2004	North Dakota	
Florida	1997-2004	Ohio	1997; 2001-2004
Georgia	1997-2004	Oklahoma	1997; 1999-2004
Hawaii		Oregon	
Idaho	1998-2004	Pennsylvania	
Illinois	1997-2004	Rhode Island	
Indiana	1997-2004	South Carolina	1997-2004
Iowa		South Dakota	
Kansas		Tennessee	1997-2004
Kentucky	1997-2004	Texas	1997-2004
Louisiana	1997-2004	Utah	
Maine		Vermont	
Maryland	1997-2001	Virginia	1997-2004
Massachusetts		Washington	
Michigan		West Virginia	1997-1999
Minnesota		Wisconsin	
Mississippi	1997-2004	Wyoming	1997-2004
Missouri	1997-2004		

Table 4.4. Determinants of State Welfare Policy Cut-off Scores.

Number of Stringent Welfare Policies Adopted by the States

Number of Welfare Policies Adopted:	State Months	Percent of State Months	Cumulative Percent
0 stringent welfare policies	1594	32.6	32.6
1 stringent welfare policy	1347	27.5	60.1
2 stringent welfare policies	1018	20.8	80.9
All three stringent welfare policies	937	19.1	100.0
Total	4896	100.0	100.0

Correlations between State Welfare Policy Cut-off Scores and State Birth Outcomes

State Policy Cut-off Scores:	Teen Birth Rate	Non-marital Birth Ratio
1 or more stringent welfare policies	.360*	.209
2 or more stringent welfare policies	.527*	.331*
All three stringent welfare policies	.238	.141

Standard errors are adjusted for multiple observations from the same states
* $p < .05$; ** $p < .01$; *** $p < .001$

Table 4.5. States with Limited Public Funding for Abortion January 1997 – December 2004.

State	Months	State	Months
Alabama	Jan97-Dec04	Montana	
Alaska	Jul98-Mar99	Nebraska	Jan97-Dec04
Arizona	Jan97-Apr00;	Nevada	Jan97-Dec04
	Aug01-Oct02	New Hampshire	Jan97-Dec04
Arkansas	Jan97-Dec04	New Jersey	
California		New Mexico	Jan97-Nov98
Colorado	Jan97-Dec04	New York	
Connecticut		North Carolina	Jan97-Dec04
Delaware	Jan97-Dec04	North Dakota	Jan97-Dec04
District of Columbia	Dec97-Dec04	Ohio	Jan97-Dec04
Florida	Jan97-Dec04	Oklahoma	Jan97-Dec04
Georgia	Jan97-Dec04	Oregon	
Hawaii		Pennsylvania	Jan97-Dec04
Idaho	Nov98-Dec04	Rhode Island	Jan97-Dec04
Illinois	Jan99-Dec04	South Carolina	Jan97-Dec04
Indiana	Jan97-Sep00;	South Dakota	Jan97-Dec04
	Sep03-Dec04	Tennessee	Jan97-Dec04
Iowa	Jan97-Dec04	Texas	Jan97-Nov00;
Kansas	Jan97-Dec04		Aug01-Dec04
Kentucky	Jan97-Dec04	Utah	Jan97-Dec04
Louisiana	Jan97-Dec04	Vermont	
Maine	Jan97-Dec04	Virginia	Jan97-Dec04
Maryland		Washington	
Massachusetts		West Virginia	
Michigan	Jan97-Dec04	Wisconsin	Jan97-Dec04
Minnesota		Wyoming	Jan97-Dec04
Mississippi	Jan97-Dec04		
Missouri	Jan97-Dec04		

Table 4.6. States with Parental Involvement Laws January 1997 – December 2004.

State	Months	State	Months
Alabama	Jan97-Dec04	Montana	
Alaska		Nebraska	Jan97-Dec04
Arizona	Mar03-Dec04	Nevada	
Arkansas	Jan97-Dec04	New Hampshire	
California		New Jersey	
Colorado	Jun03-Dec04	New Mexico	
Connecticut		New York	
Delaware	Jan97-Dec04	North Carolina	Jan97-Dec04
District of Columbia		North Dakota	Jan97-Dec04
Florida		Ohio	Jan97-Dec04
Georgia	Jan97-Dec04	Oklahoma	Jun01-May02;
Hawaii			Nov04-Dec04
Idaho	Jan97-Nov04	Oregon	
Illinois		Pennsylvania	Jan97-Dec04
Indiana	Jan97-Dec04	Rhode Island	Jan97-Dec04
Iowa	Jan97-Dec04	South Carolina	Jan97-Dec04
Kansas	Jan97-Dec04	South Dakota	Aug97-Dec04
Kentucky	Jan97-Dec04	Tennessee	July99-Dec04
Louisiana	Jan97-Dec04	Texas	Sep99-Dec04
Maine	Jan97-Dec04	Utah	Jan97-Dec04
Maryland	Jan97-Dec04	Vermont	
Massachusetts	Jan97-Dec04	Virginia	July97-Dec04
Michigan	Jan97-Dec04	Washington	
Minnesota	Jan97-Dec04	West Virginia	Jan97-Dec04
Mississippi	Jan97-Dec04	Wisconsin	Jan97-Dec04
Missouri	Jan97-Dec04	Wyoming	Jan97-Dec04

Table 4.7. States with Informed Consent Laws January 1997 – December 2004.

State	Months	State	Months
Alabama	Jan97-Dec04	Montana	Jan97-Feb99
Alaska	Jan97-Dec04	Nebraska	Jan97-Dec04
Arizona	Feb01-Dec04	Nevada	Jan97-Dec04
Arkansas		New Hampshire	
California	Jan97-Dec04	New Jersey	
Colorado		New Mexico	
Connecticut	Jan97-Dec04	New York	
Delaware	Jan97-Dec04	North Carolina	
District of Columbia		North Dakota	Jan97-Dec04
Florida	Jan97-Jun97	Ohio	Jan97-Dec04
Georgia		Oklahoma	
Hawaii		Oregon	
Idaho	Jan97-Dec04	Pennsylvania	Jan97-Dec04
Illinois		Rhode Island	Jan97-Dec04
Indiana	Jan97-Dec04	South Carolina	Jan97-Dec04
Iowa		South Dakota	Jan97-Dec04
Kansas	Jan97-Dec04	Tennessee	Jan97-Sep00
Kentucky	Jan97-Feb99;	Texas	Jan04-Dec04
	Dec00-Dec04	Utah	Jan97-Dec04
Louisiana	Jan97-Dec04	Vermont	
Maine	Jan97-Dec04	Virginia	Jan97-Dec04
Maryland		Washington	
Massachusetts	Jan97-Dec04	West Virginia	Mar03-Dec04
Michigan	Oct98-Jan99;	Wisconsin	Aug99-Dec04
	Sep99-Dec04	Wyoming	
Minnesota	Jan97-Dec04		
Mississippi	Jan97-Dec04		
Missouri			

Table 4.8. States with Waiting Period Laws January 1997 – December 2004.

State	Months	State	Months
Alabama	Oct02-Dec04	Montana	
Alaska		Nebraska	Jan97-Dec04
Arizona	Feb01-Dec04	Nevada	
Arkansas		New Hampshire	
California		New Jersey	
Colorado		New Mexico	
Connecticut		New York	
Delaware		North Carolina	
District of Columbia		North Dakota	Jan97-Dec04
Florida		Ohio	Jan97-Dec04
Georgia		Oklahoma	
Hawaii		Oregon	
Idaho	Jan97-Dec04	Pennsylvania	Jan97-Dec04
Illinois		Rhode Island	
Indiana	Jan98-Dec04	South Carolina	Jan97-Dec04
Iowa		South Dakota	Jan97-Dec04
Kansas	Jan97-Dec04	Tennessee	
Kentucky	Jan99-Dec04	Texas	Jan04-Dec04
Louisiana	Jan97-Dec04	Utah	Jan97-Dec04
Maine		Vermont	
Maryland		Virginia	Oct01-Dec04
Massachusetts		Washington	
Michigan	June99-Dec04	West Virginia	Mar03-Dec04
Minnesota	Jul03-Dec04	Wisconsin	Jan98-Dec04
Mississippi	Jan97-Dec04	Wyoming	
Missouri			

Table 4.9. Determinants of State Abortion Policy Cut-off Scores.

Number of Stringent Abortion Policies Adopted by the States

Number of Abortion Policies Adopted:	State Months	Percent of State Months	Cumulative Percent
0 stringent abortion policies	773	15.8	15.8
1 stringent abortion policy	1117	22.8	38.6
2 stringent abortion policies	1028	21.0	59.6
3 stringent abortion policies	599	12.2	71.8
All four stringent abortion policies	1379	28.2	100.0
Total	4896	100.0	100.0

Correlations between State Abortion Policy Cut-off Scores and State Birth Outcomes

State Policy Cut-off Scores:	Abortion Rate	Abortion Ratio
1 or more stringent abortion policies	-.211	-.244*
2 or more stringent abortion policies	-.311*	-.286*
3 or more stringent abortion	-.271*	-.241
All four stringent abortion policies	-.331**	-.348**

Standard errors are adjusted for multiple observations from the same states
* $p < .05$; ** $p < .01$; *** $p < .001$

Table 4.10. Correlations between State Welfare Policies January 1997-December 2004.

	Welfare Policy B			
Welfare Policy A	Family Cap	Eligibility of Pregnant Women	Low Benefit State	Adjusted Maximum Cash Benefit Amount
Family Cap		.217 (.211)	.422*** (.430)	.355*
Eligibility of Pregnant Women	.217 (.223)		.420*** (.439)	.415***
Low Benefit State	.422*** (.414)	.420*** (.401)		
Adjusted Maximum Cash Benefit Amount	.355*	.415***		

Standard errors are adjusted for multiple observations from the same states.
Regression coefficients when using Policy A to predict Policy B are included in parentheses.
* $p < .05$; ** $p < .01$; *** $p < .001$

Table 4.11. Correlations between State Abortion Policies January 1997-December 2004.

Abortion Policy A	Abortion Policy B: Public Funding	Parental Involvement	Informed Consent	Waiting Period
Public Funding		.448*** (.467)	.209 (.225)	.364*** (.361)
Parental Involvement	.448*** (.430)		.430*** (.443)	.514*** (.490)
Informed Consent	.209 (.195)	.430*** (.417)		.608*** (.563)
Waiting Period	.364*** (.366)	.514*** (.538)	.608*** (.657)	

Standard errors are adjusted for multiple observations from the same states.
Regression coefficients when using Policy A to predict Policy B are included in parentheses.
* $p < .05$; ** $p < .01$; *** $p < .001$

Table 4.12. Correlations between State Welfare and Abortion Policies January 1997- December 2004.

Welfare Policy	Abortion Policy			
	Public Funding	Parental Involvement	Informed Consent	Waiting Period
Family Cap	0.033 (.031)	0.090 (.088)	-0.003 (-.003)	-0.065 (-.061)
Eligibility of Pregnant Women	.286* (.279)	.293* (.297)	-0.151 (-.158)	0.052 (.050)
Low Benefit State	.366*** (.341)	0.100 (.096)	-0.133 (-.132)	-0.050 (-.046)
Adjusted Maximum Cash Benefit Amount	.405***	0.212	-0.088	0.083

Abortion Policy	Welfare Policy			
	Family Cap	Eligibility of Pregnant Women	Low Benefit State	Adjusted Maximum Cash Benefit Amount
Public Funding	.033 (.034)	.286* (.294)	.366*** (.394)	.405***
Parental Involvement	.090 (.091)	.293* (.289)	.100 (.103)	.212
Informed Consent	-.003 (-.003)	-.151 (-.144)	-.133 (-.133)	-.088
Waiting Period	-.065 (-.069)	.052 (.054)	-.050 (-.054)	.083

Standard errors are adjusted for multiple observations from the same states.
Regression coefficients when using Policy A to predict Policy B are included in parentheses.
* $p < .05$; ** $p < .01$; *** $p < .001$

Table 4.13. Typologies of State Welfare and Abortion Policies January 1997-December 2004.

Number of State Calendar Months

Number of State Welfare Policies Adopted		Number of State Abortion Policies Adopted: Lenient 0	Lenient 1	Stringent 2	Stringent 3	Stringent 4	Totals
Lenient	0	623	143	127	218	483	1594
	1	11	481	317	58	480	1347
Stringent	2	43	433	228	225	89	1018
	3	96	60	356	98	327	937
	Totals	773	1117	1028	599	1379	4896

Percentage of State Calendar Months

Number of State Welfare Policies Adopted		Number of State Abortion Policies Adopted: Lenient 0	Lenient 1	Stringent 2	Stringent 3	Stringent 4	Totals
Lenient	0	0.127	0.029	0.026	0.045	0.099	0.326
	1	0.002	0.098	0.065	0.012	0.098	0.275
Stringent	2	0.009	0.088	0.047	0.046	0.018	0.208
	3	0.020	0.012	0.073	0.020	0.067	0.191
	Totals	0.158	0.228	0.210	0.122	0.282	1.000

Correlation between state abortion policy stringency and state welfare policy stringency: $r = .115^*$

Standard errors are adjusted for multiple observations from the same states.
Phi coefficients are reported in instances where both variables are dichotomous.
* $p < .05$

Table 4.14. Dichotomous Typologies of State Welfare and Abortion Policy January 1997-December 2004.

Number of State Months

State Welfare Policy	State Abortion Policy: Lenient	Stringent	Totals
Lenient	1258	1683	2941
Stringent	632	1323	1955
Totals	1890	3006	4896

Percentage of Total State Months

State Welfare Policy	State Abortion Policy: Lenient	Stringent	Totals
Lenient	0.257	0.344	0.601
Stringent	0.129	0.270	0.399
Totals	0.386	0.614	1.000

*Correlation between dichotomous state abortion policy stringency and dichotomous state welfare policy stringency: $r = .105$**

Standard errors are adjusted for multiple observations from the same states.
Phi coefficients are reported in instances where both variables are dichotomous.
* $p < .05$

Table 4.15. Marginal Probabilities of Lenient and Stringent State Welfare and Abortion Policies January 1997-December 2004.

if	Lenient Welfare	then the Probability of	Lenient Abortion	= 0.428
if	Stringent Welfare	then the Probability of	Lenient Abortion	= 0.323
if	Lenient Welfare	then the Probability of	Stringent Abortion	= 0.572
if	Stringent Welfare	then the Probability of	Stringent Abortion	= 0.677
if	Lenient Abortion	then the Probability of	Lenient Welfare	= 0.666
if	Stringent Abortion	then the Probability of	Lenient Welfare	= 0.560
if	Lenient Abortion	then the Probability of	Stringent Welfare	= 0.334
if	Stringent Abortion	then the Probability of	Stringent Welfare	= 0.440

Figure 4.1. State Family Cap Policies in January 1997 and December 2004.

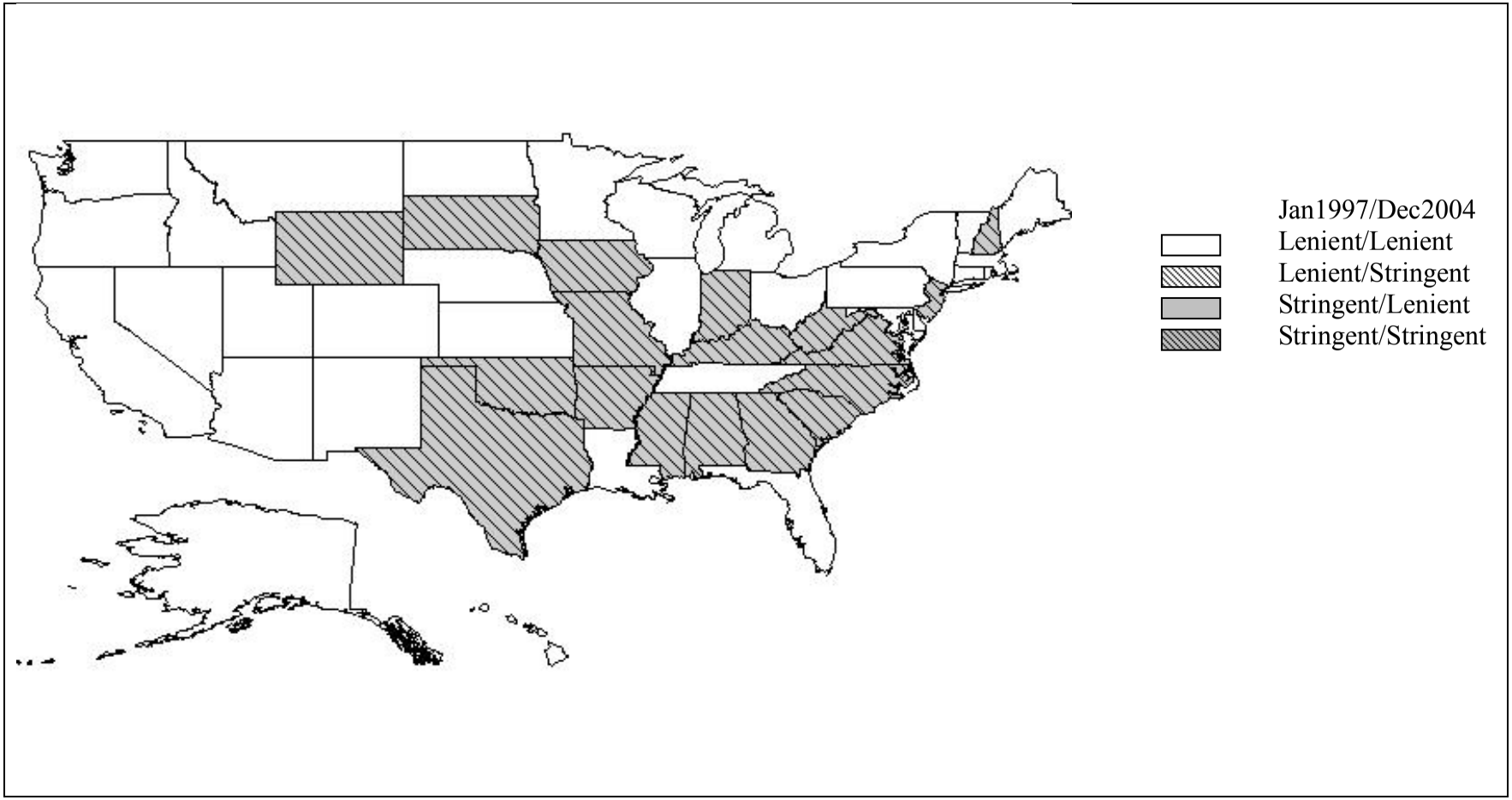


Figure 4.2. State Policies Regarding the Welfare Eligibility of Pregnant Women in January 1997 and December 2004.

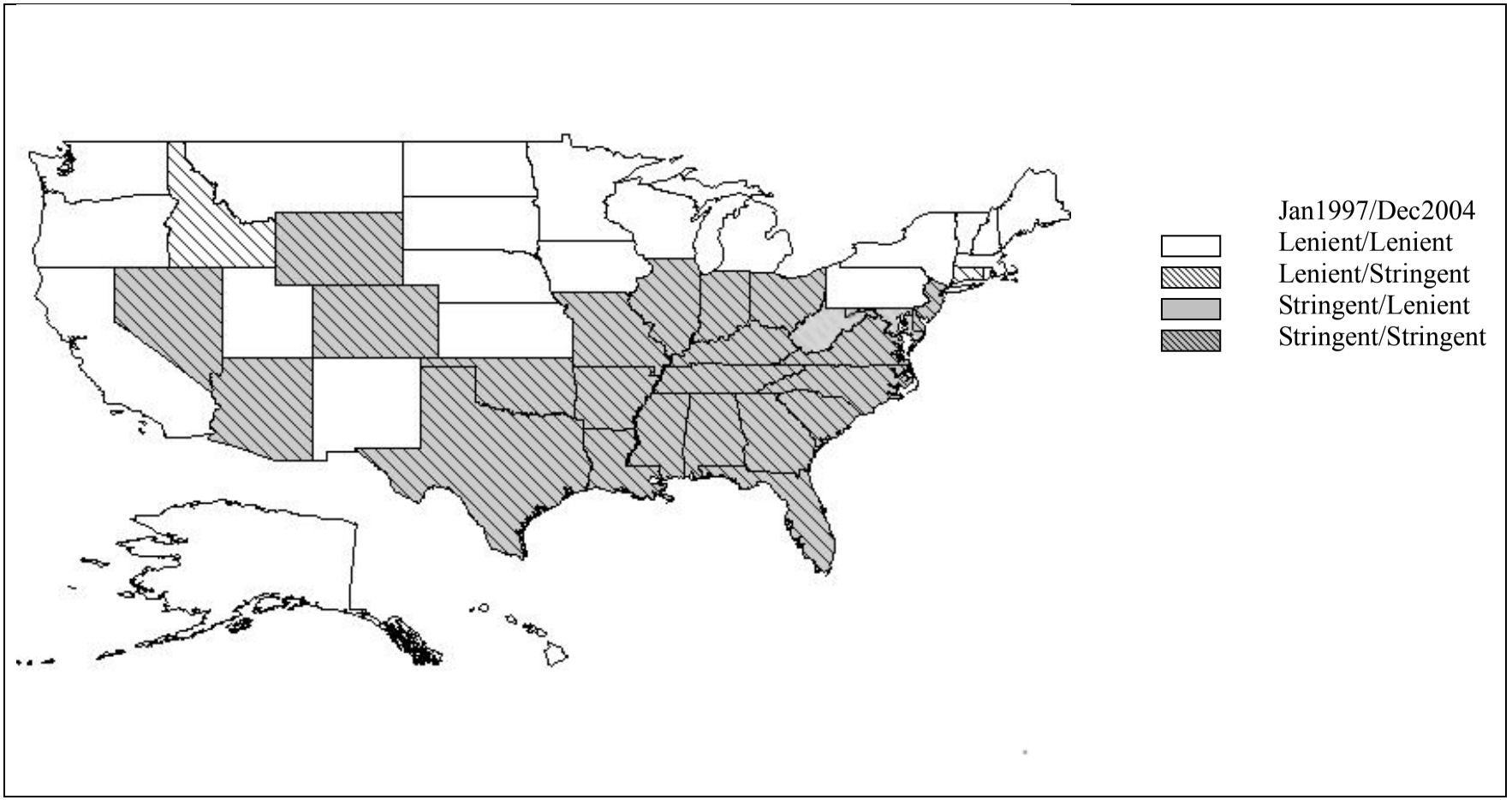


Figure 4.3. State Welfare Benefit Levels in January 1997 and December 2004.

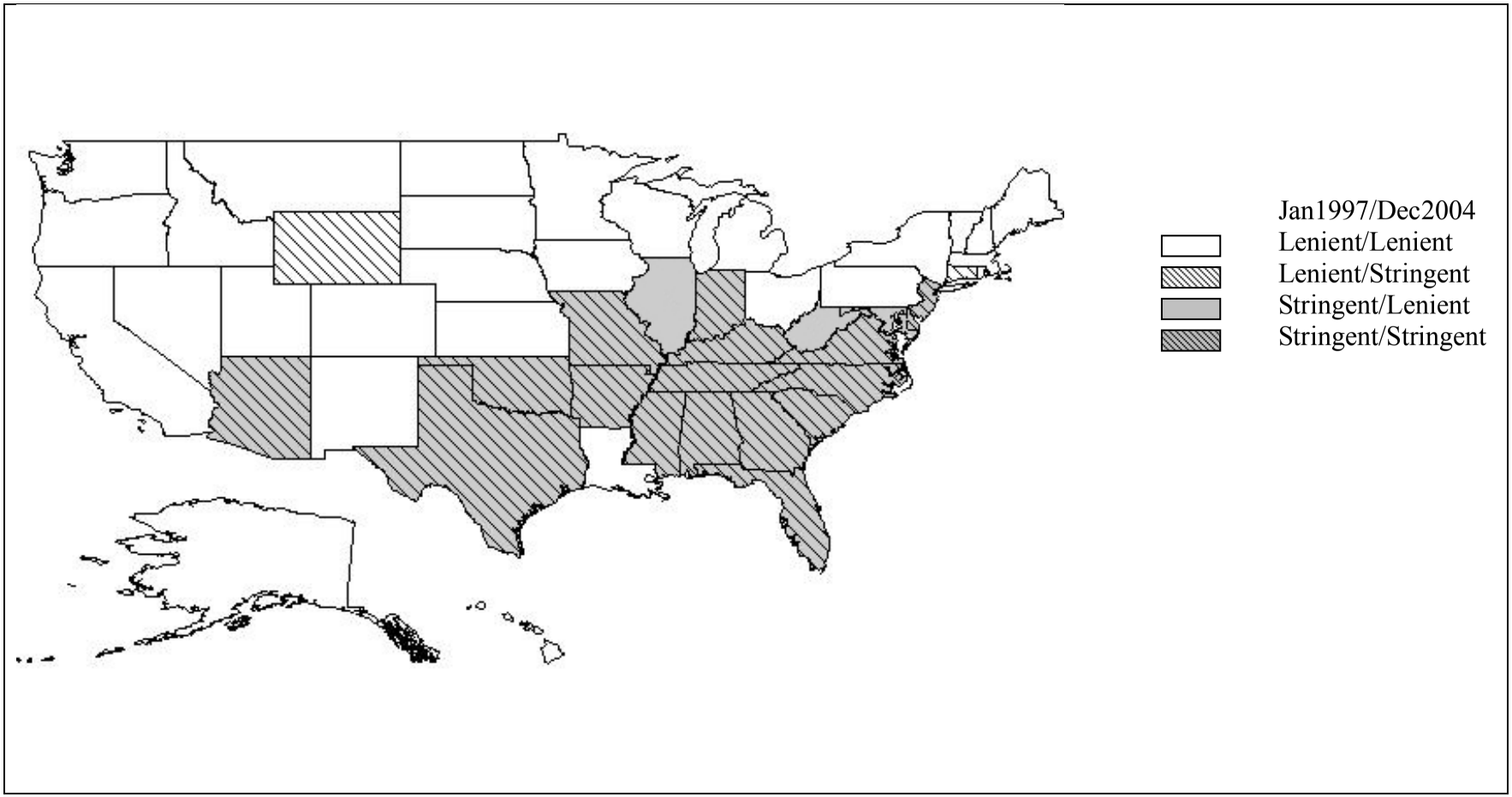


Figure 4.4. State Welfare Policy Stringency in 1997 and December 2004.

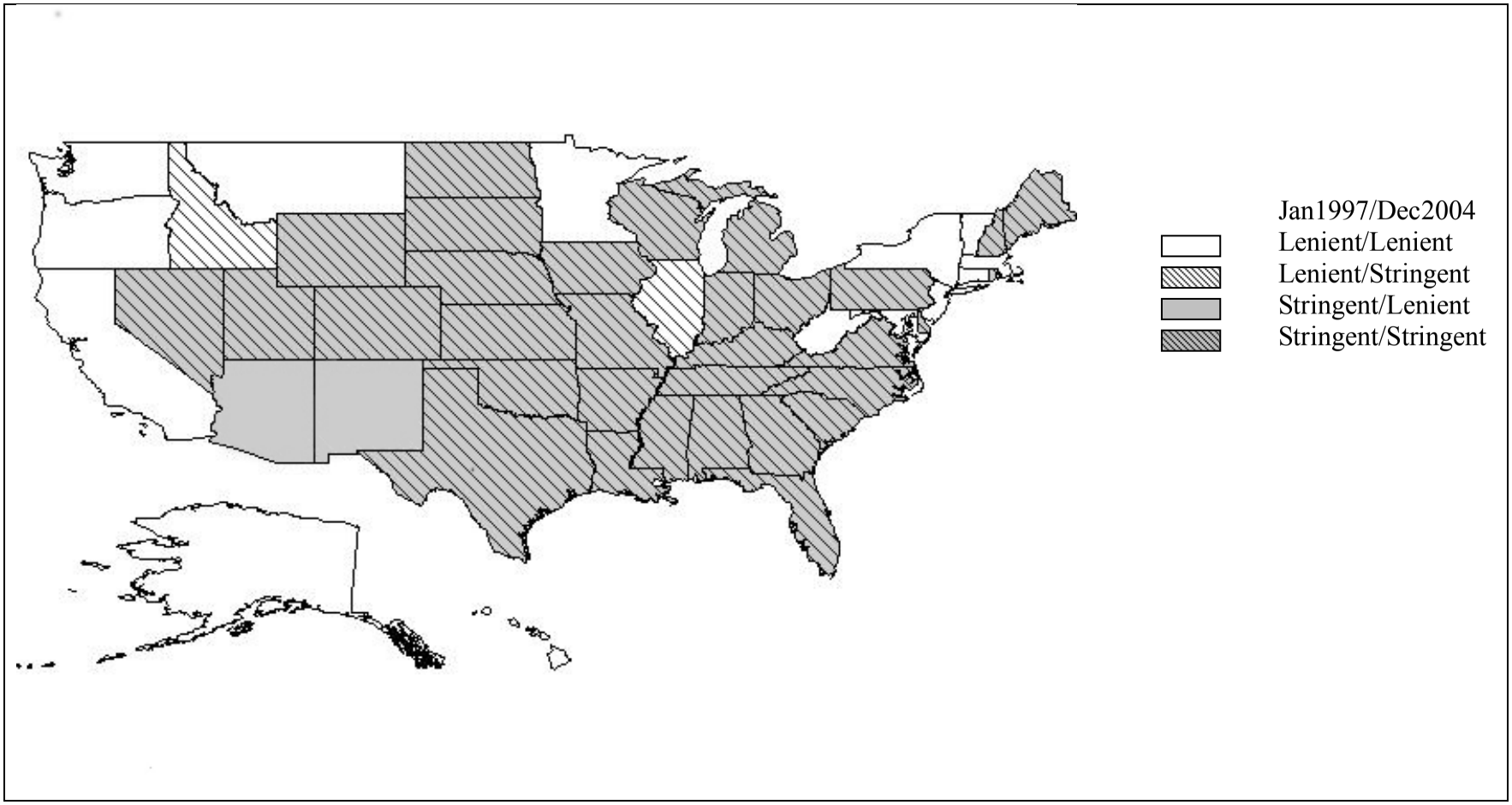


Figure 4.5. State Policies Regarding the Public Funding of Abortion in January 1997 and December 2004.

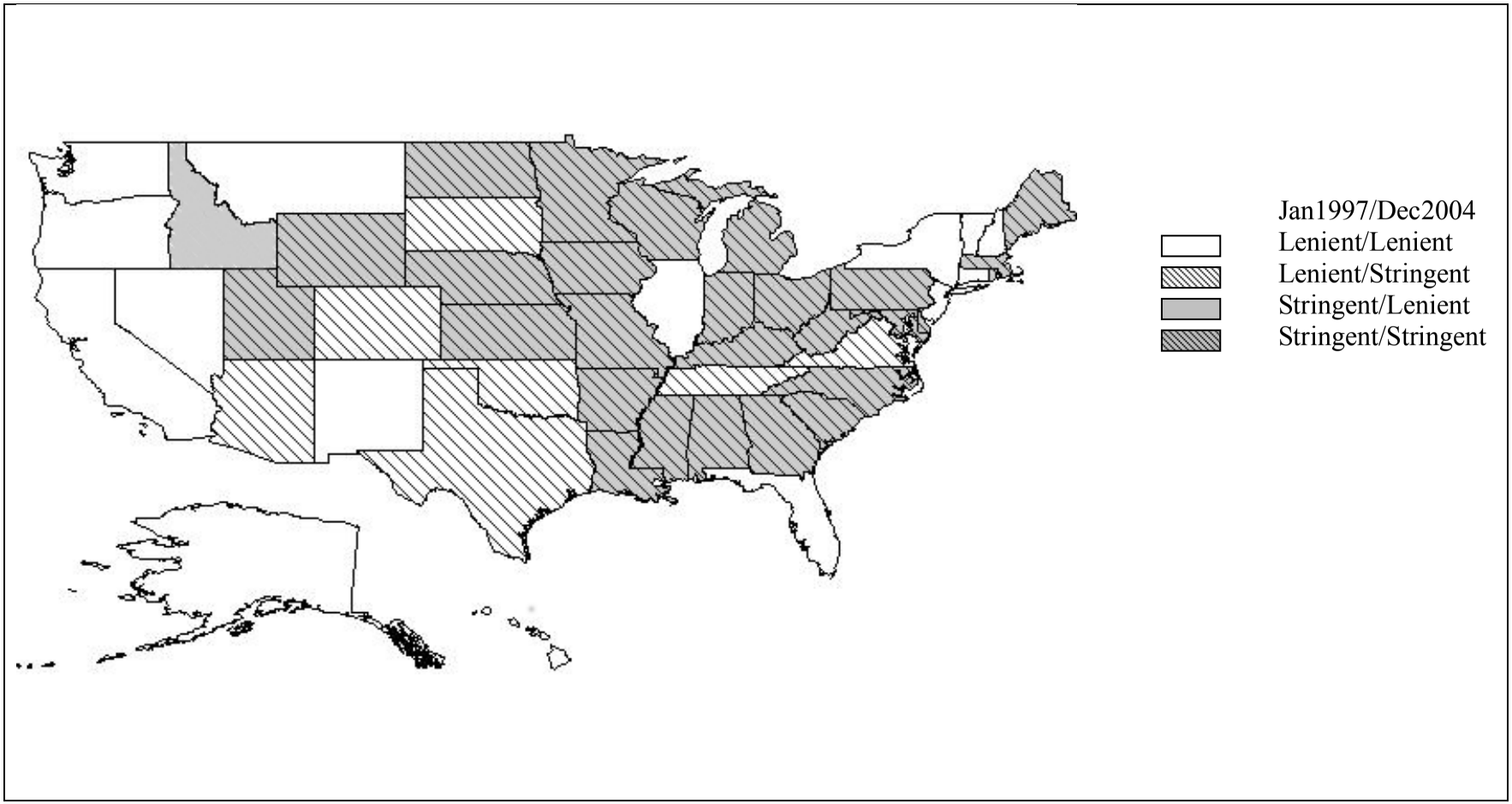


Figure 4.6. State Parental Consent and Parental Involvement Policies in January 1997 and December 2004.

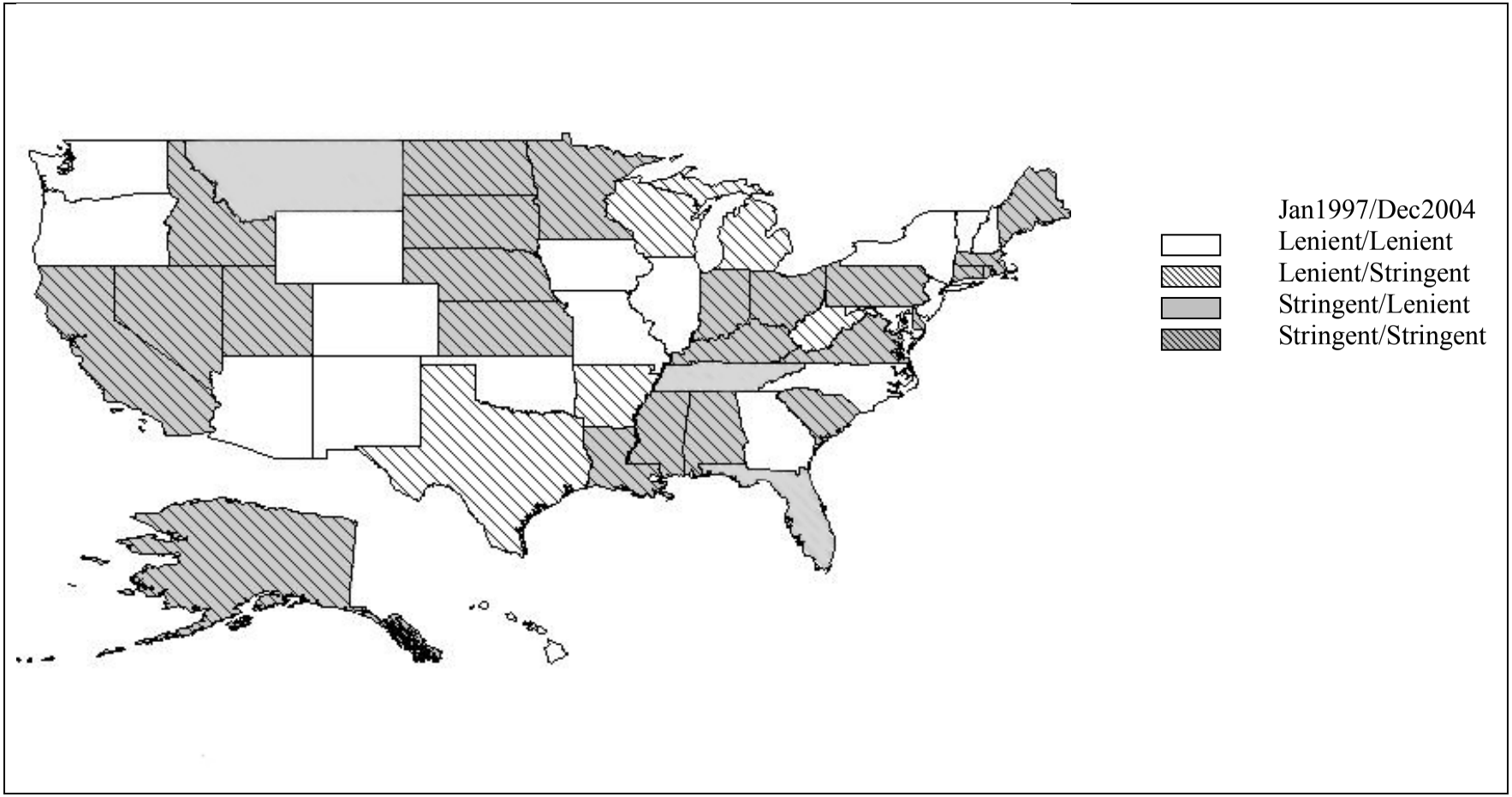


Figure 4.7. State Policies Regarding Informed Consent before an Abortion in January 1997 and December 2004.

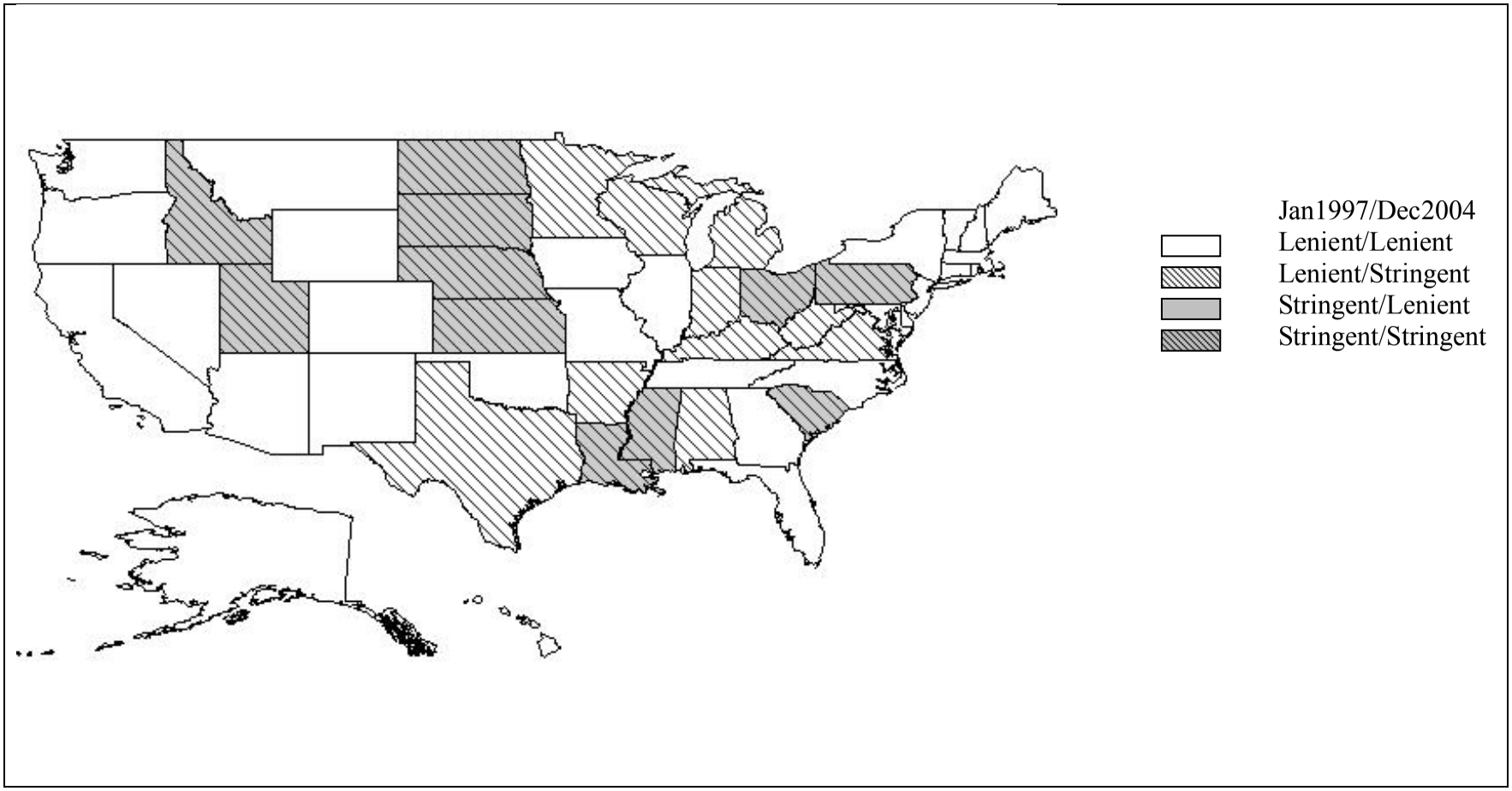


Figure 4.8. State Policies Regarding Waiting Periods Before an Abortion in January 1997 and December 2004.

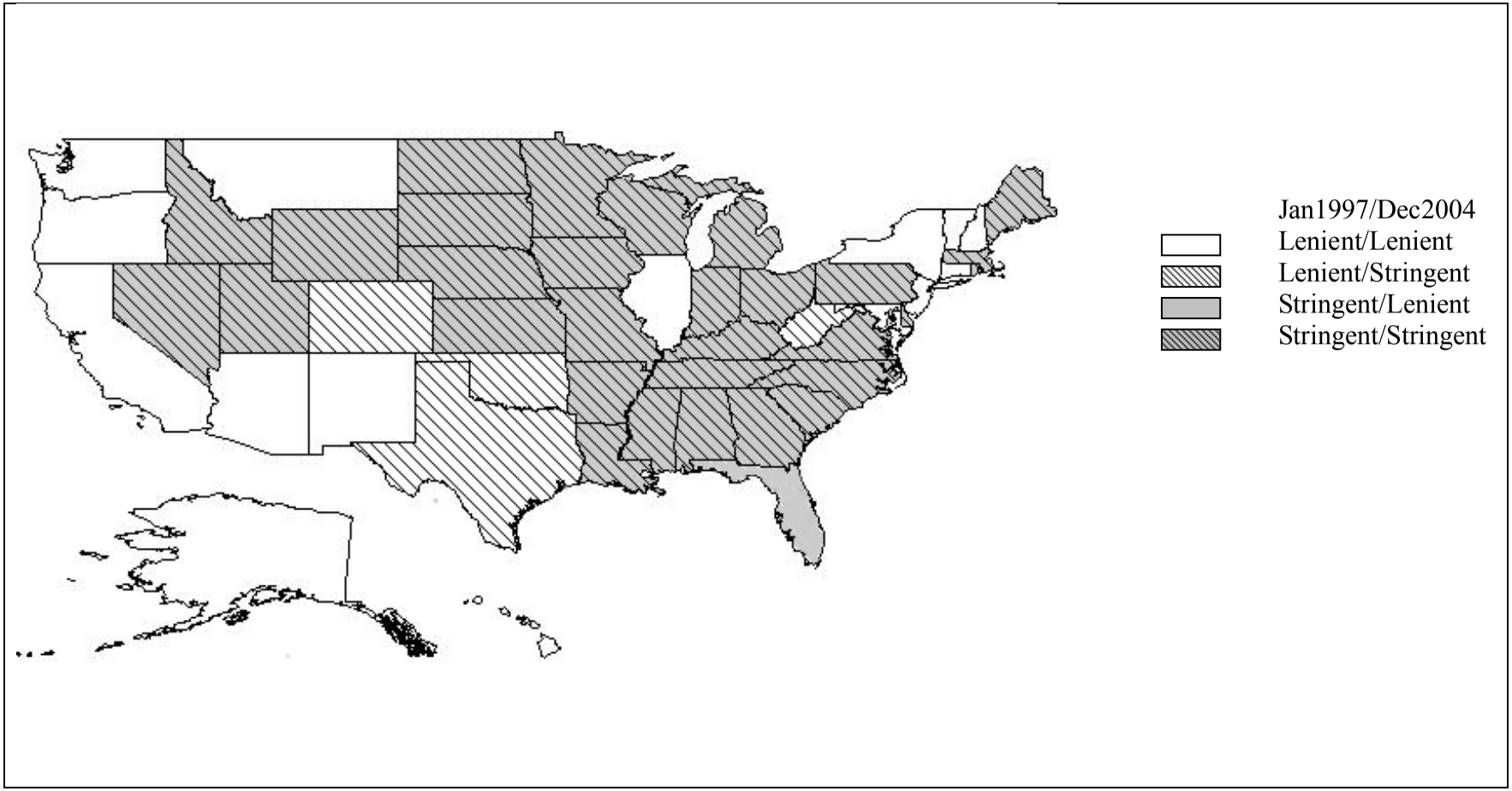
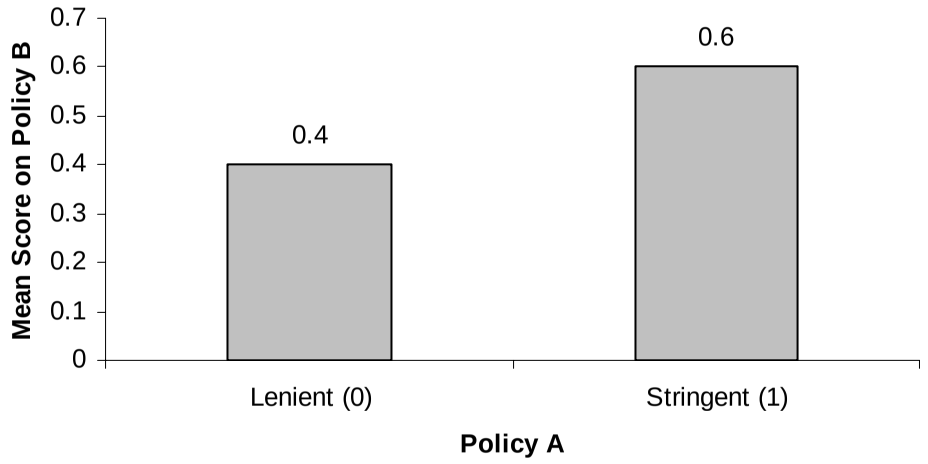


Figure 4.9. State Abortion Policy Stringency in January 1997 and December 2004.

Policy B	Policy A: Lenient	Policy A: Stringent	Totals
Lenient	15	10	25
Stringent	10	15	25
Totals	25	25	50



Regression Coefficient when Using State Policy A to Predict State Policy B = .20

Figure 4.10. Simulated Contingency Table and Correlation Between Two State Policies.

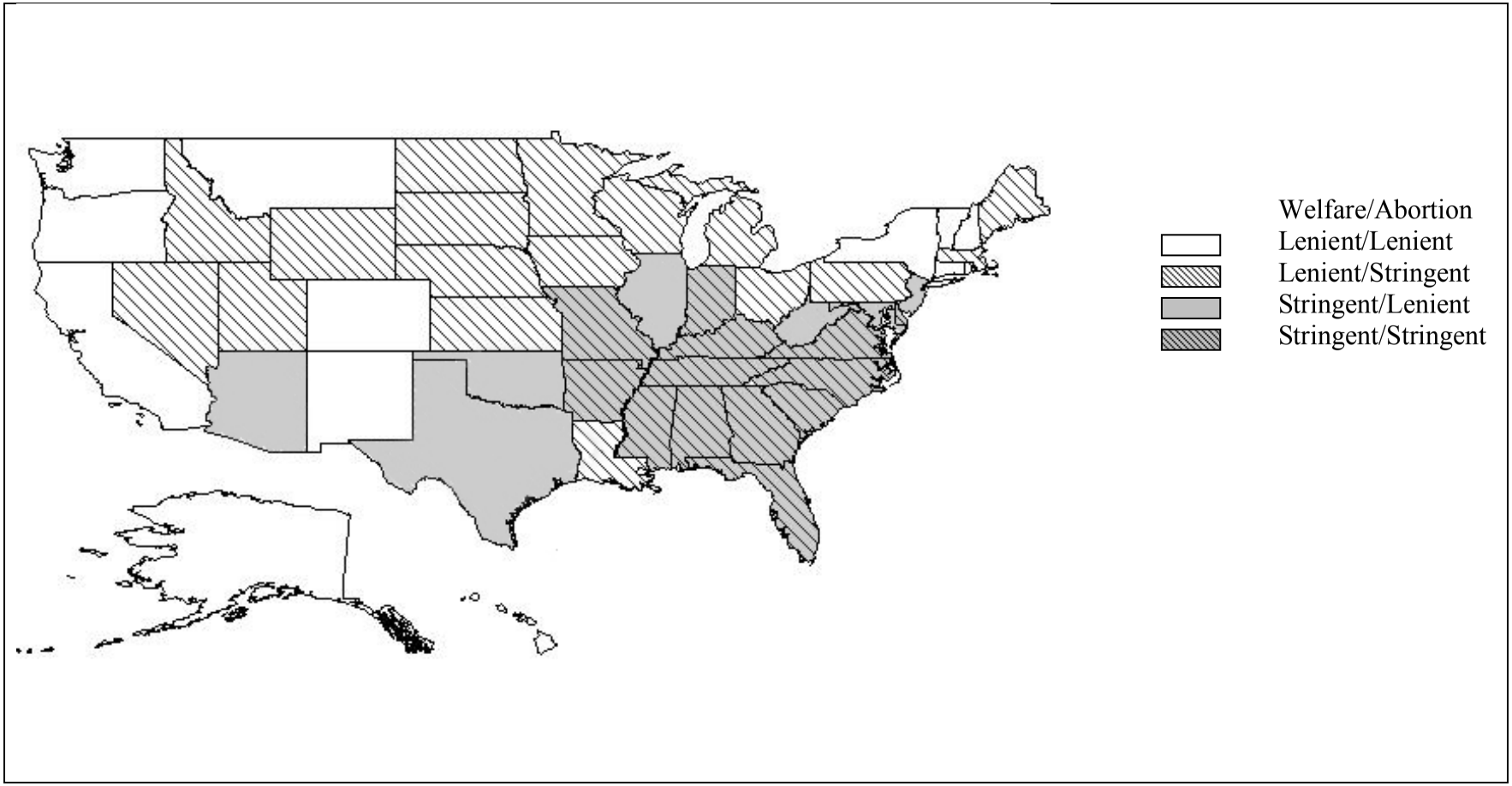


Figure 4.11. State Welfare and Abortion Policy in January 1997.

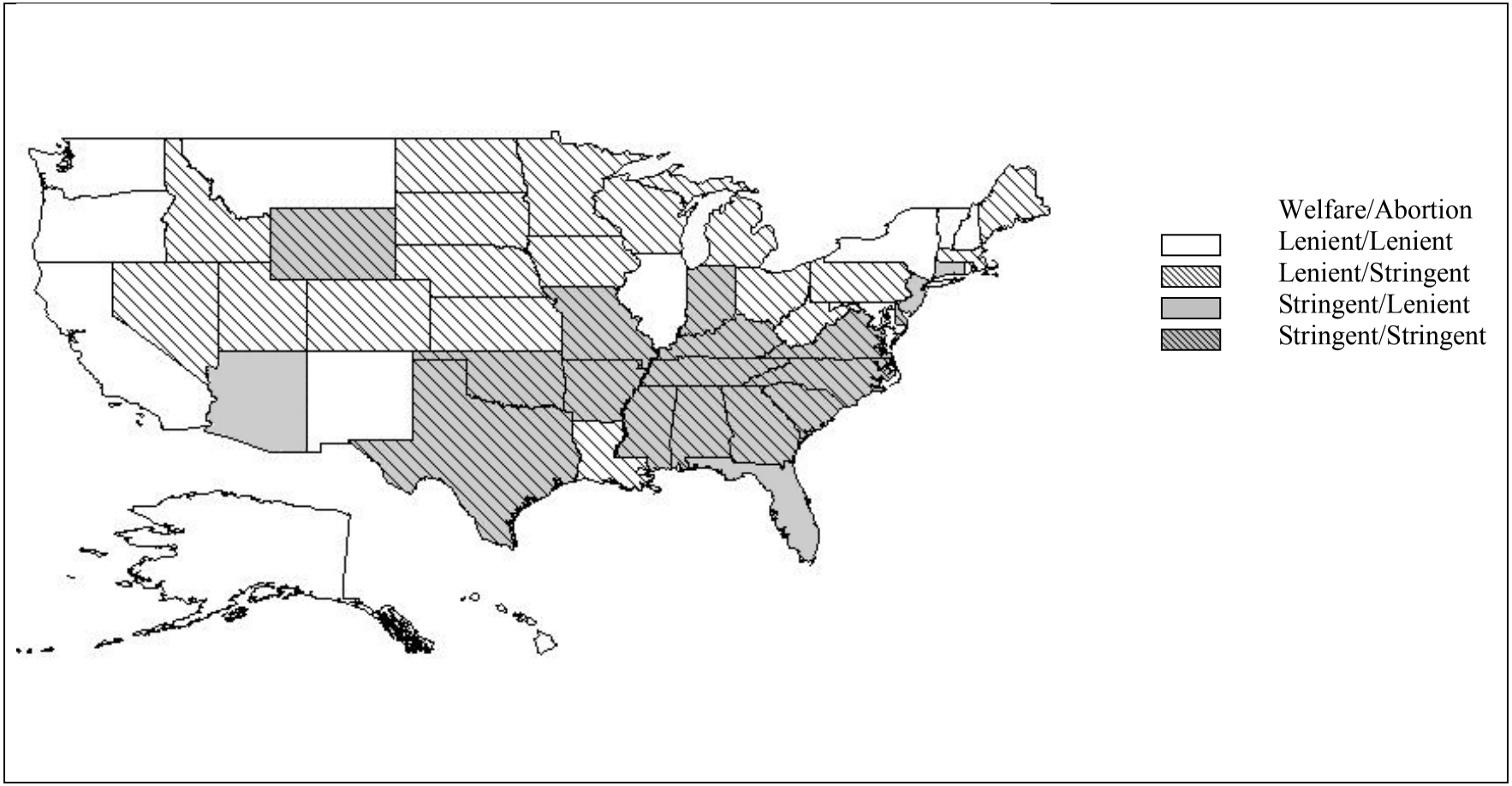


Figure 4.12 State Welfare and Abortion Policy in December 2004.

CHAPTER FIVE: NLSY97 Data Description and Variable Coding

Do state family formation related welfare policies and state abortion policies affect the pregnancy decisions of young women? In order to answer these questions I utilized data from young women who participated in the National Longitudinal Survey of Youth 1997 cohort (NLSY97), conducted by the Bureau of Labor Statistics. The following chapter provides a description of the NSLY97 sample and outlines the creation of two datasets and the coding of dependent and independent variables which were used in subsequent analyses.

The NLSY97 is a nationally representative sample of approximately 9,000 adolescents ages 12-17 in 1997 (Center for Human Resource Research [CHRR], 2005). During the first round of interviews adolescents and one of their parents were interviewed. Follow-up interviews have been conducted with the youth annually since 1997. The NLSY97 is an ideal dataset for studying the pregnancy decisions of young women for several reasons.

The NLSY97 collects data on the pregnancy and fertility histories of individual's on a yearly basis. One advantage of using individual level data is that it records the event of an abortion, regardless of where it is obtained. Many women cross state lines to receive abortions and this phenomenon is often masked with state level data as state rates often include all abortions obtained within a state and do not differentiate between resident and non-resident abortions (Ellertson, 1997; Blank, George, & London, 1996). Though the NLSY97 does not record the state in which an abortion is obtained, it does allow for an examination of whether or not state policies affect the likelihood of abortion among state residents. In addition, individual level data is also ideal for understanding the individual processes and background characteristics of pregnancy and pregnancy resolution decisions (Bachrach & Baldwin, 1991).

The NLSY97 is also a nationally representative longitudinal survey and contains a large sample of adolescents (CHRR, 2005). Previous researchers have used the data set to examine the effects of variations in state welfare stringency on adolescent employment and school enrollment (Hao, Astone, & Cherlin, 2004), the effects of variations in state abortion stringency on adolescent sexual activity (Sen, 2006), and variations in state level economic predictors on adolescent pregnancy and pregnancy resolution decisions (Arkes & Klerman, 2005). Taken together, these studies suggest that the respondents in the sample should have experienced sufficient state policy variation and a sufficient number of pregnancy events to examine the research questions. Of the 4,385 female respondents, at least 717 of them report having ever been pregnant at some time, resulting in roughly 3,200 pregnancies and approximately 520 abortions that occurred in the year 1997 or later. Moreover, the longitudinal nature of the data allows one to examine the effects of state policies on first and higher order pregnancies of the same women, as opposed to limiting the sample to first pregnancies or taking a cross section of pregnant women.

The NLSY97 also contains a sample of young women whose fertility histories occur primarily after 1996, during the era of welfare waivers and welfare reform when states were given authority to draft more unique welfare rules. Prior research on these topics deals primarily with women subject to the previous welfare system, AFDC, and not TANF, the current welfare program (Argys, Averett & Rees, 2000; Lundberg & Plotnick, 1990; Lundberg & Plotnick, 1995; Plotnick, 1992; Plotnick 1990; Cooksey, 1990; Casper, 1990; Levine, Trainor, & Zimmerman 1995).

Data on pregnancies and abortions in the NLSY97 is also an improvement over previous studies because the research team utilized audio computer-assisted self-interviewing

technologies (ACASI) when asking about sensitive information such as abortions (CHRR, 2005). When collecting sensitive data about topics like sexual activity, ACASI has been demonstrated to be an improvement over face to face interviews and other methods of data collection (Gribble, Miller, Rogers, Turner, 1999; Perlis et al., 2004; Jagannathan, 2001). This technique helped the NLSY97 researchers to overcome some of the problems of underreported abortions that were present in earlier national surveys and studies (Gribble et al., 1999; Bachrach & Baldwin, 1991; Jones & Forrest, 1992; Fu, Darroch, Henshaw, & Kolb, 1998); however, the extent to which this methodology has resolved the problem of underreported abortions that occurred in the NLSY79 is still unclear (see Bachrach & Baldwin, 1991; Jones & Forrest, 1992). Nevertheless, this method remains the best method for gathering information about induced abortions, and though underreporting of abortion is likely to still occur in the data, the NLSY97 is the best source of individual level survey data available for the research questions of this project.

Data Collection and Sample Description

The NLSY97 contains a sample of 4,385 females who were between the ages of 12 and 16 on December 31, 1996. The sample contains two components, a nationally representative cross sectional sample and a supplemental over sample of African American and Hispanic adolescents (CHRR, 2007). The first round of interviews was conducted between January and September of 1997 and March through May of 1998. During the first interview adolescents and one of their parents responded to a battery of questions. Information was obtained from roughly 89% of the adolescent's parents. Follow-up interviews have been conducted with the youth annually since the fall of 1997. This particular study focuses on the 4,385 young women ages 12-

17 that participated in the survey in 1997 and utilizes all available follow-up interviews of these women through the 2004 wave of data collection, when respondents ranged in age from 19-24.

Table 5.1 displays the interview schedule and response rates for the female respondents for the first eight waves of data collection. With the exception of the 1997 wave, interview waves typically started in the fall of each year and lasted until spring or summer of the following year (e.g. interviews for the 2004 wave began in October 2004 and ended in July 2005). The response rates for each wave of data collection exceeded 85%, and over 70% of the respondents participated in all eight waves of data collection. It was typical for a respondent who missed a wave of data collection to be reinterviewed during a subsequent wave. Table 5.2 displays the distribution of the number of interviews completed by the NLSY97 female respondents. Given the low levels of survey attrition, the average number of interviews completed by each respondent was more than seven.

The NLSY97 represents a nationally representative sample of adolescents ages 12-16 on December 31, 1996. Table 5.3 provides a weighted demographic description of the women in the sample based on data from the first wave of data collection. The birth years of the respondents were evenly distributed with roughly one fifth of the sample born in each year between 1980 and 1984. Roughly two thirds were white, fifteen percent were African American, twelve percent were Hispanic, and the remaining six percent were either of mixed race or of another minority racial group. At the time of the first interview, approximately one fourth of the NLSY97 female respondents resided in the West and one fourth in the North Central regions of the United States. Thirty-one percent lived in the South, and eighteen percent were from the Northeast[1]. Regarding

[1] The BLS defines the regions for the NLSY97 as follows: Northeast) CT, ME, MA, NH, NJ, NY, PA, RI, VT; North Central) IL, IN, IA KS, MI, MN, MO, NE, ND, OH, SD, WI; South) AL, AR, DE, DC, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV; and, West) AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY.

religion, one in four of the female respondents identified themselves as Catholic, while 12% reported no religious preference or belief. About half of the respondents lived with both of their biological parents at age six. In addition, seventeen percent of the young women were born to a mother who had not graduated from high school; whereas 42% of the young women's biological mothers had completed at least some college at the time of the respondents' birth. Finally, twenty two percent of the female respondents were born to a teen mother, while 10 percent were born to a mother age thirty or older.

Dataset Creation

For the planned analyses it was necessary to create two separate datasets. The first dataset was a person month dataset that contained a line of data for each month between January 1997 and December 2004 that an individual woman was at risk for a pregnancy. In this dataset it was possible for each respondent to have as many as 96 lines of data. The second dataset included a single line of data for each pregnancy event, and therefore, only women with a pregnancy that started and ended between January 1997 and December 2004 were included in this dataset. Women with multiple pregnancies during this time frame contributed multiple lines of data.

In order to create the first dataset it was necessary to compile the complete pregnancy histories for each respondent. In the first and all subsequent waves of the NLSY97, female respondents were asked whether they are currently pregnant, have ever been pregnant or have been pregnant since the date of the most recent interview. Respondents were also asked to provide information on the month and year that each pregnancy ended and the result of the pregnancy whether it was a live birth, stillbirth, miscarriage, or induced abortion. For all live

births, the NLSY97 provides a variable indicating the birth month for each child. For non-live pregnancies, respondents are asked to report how many months along in the pregnancy they were when the pregnancy ended. For women that are currently pregnant, they are asked how many weeks along they are in their pregnancy. Using the information provided by these variables, it was possible to create the pregnancy histories—including the pregnancy start dates, end dates, and pregnancy outcomes—for all of the female respondents in the NLSY97 up through their date of final interview. A detailed description of the creation of the pregnancy histories is provided in Appendix 1.

Women in the sample experienced a total of 3,843 pregnancy events. 2,483 Women reported no pregnancy event, whereas 1,902 reported at least one pregnancy. The women gave birth to 2,290 children, resulting from 2,260 pregnancies that ended in live births (there were 28 sets of twins and one set of triplets). In addition to live births, the women experienced 721 miscarriages and stillbirths and 543 abortions. Moreover, the women reported an additional 68 pregnancies ending in non-live births, but the outcome was unknown, and another 251 women were pregnant at the time of their last interview, thus the outcomes of these pregnancies remain unknown.

The main research questions involve the influence of state policies on the pregnancy decisions of the young women in the sample. Therefore, it was necessary to calculate the residence histories of the respondents in order to link them with the appropriate state policies. Data on the residence history of each respondent is located in the restricted data files of the NLSY97.[2] In each round of the NLSY97, interviewers recorded the respondents' current state of residence. Moreover, in waves two and later respondents were asked to provide their migration

[2] Authorization to use the restricted data files was granted to the principal investigator by the Bureau of Labor Statistics in June 2007.

history, including the dates and locations of all residential moves since the date of the last interview. Using this information, I was able to construct the respondents' migration histories. A detailed description of the coding of each respondent's monthly state of residence can be found in Appendix 1.

Utilizing the pregnancy start dates, end dates, pregnancy outcomes, and migration histories, I created a person month dataset which included a single line of data for each month between January 1997 and December 2004 that a respondent was at risk for a pregnancy. With 4,385 respondents, there was a possible 420,960 person months available for the analysis. However, 23,537 person months were dropped because they occurred after a respondent's final interview, and therefore no information was available about the respondent's pregnancy status. An additional 19,872 person months were dropped because respondents were currently pregnant during these months and therefore not at risk for a subsequent pregnancy. Since I was interested in examining the effects of state policies, an additional 1,667 person months were excluded because the respondents' state of residence was unknown[3]. The final sample contained 375,884 person months, or approximately 86 person months per respondent.

During these 375,884 person months the women in the sample experienced 3,497 pregnancy events. A total of 3,843 pregnancy events were contained in the pregnancy histories, however, 183 occurred before January 1997 and 53 occurred after December 2004. An additional 34 represented duplicate pregnancy events and were therefore counted only once (e.g. two miscarriages reported with the same start and end dates). Moreover, 75 pregnancies (2.0% of the total) were dropped because the state of residence was unknown. An unknown state of

[3] The predictor variables in this dataset were lagged one month. Therefore, technically a particular person month was dropped if the state of residence in the prior month was unknown.

residence was about twice as likely to occur in the event of an abortion, stillbirth, or miscarriage as in the event of a live birth.

A second data set was created with a single line of code for each pregnancy event with a known outcome. Of the 3,497 pregnancy events in the first dataset, 310 were dropped because the outcome of the pregnancy was either unknown because the outcome was missing (61 events) or unknown because the respondent was pregnant at the time of the last interview (249 events). An additional six pregnancy events were dropped because the state of residence during the month of conception was unknown[4]. This resulted in a total of 3,181 pregnancy events contributed by 1,778 women. 2,213 of the pregnancies resulted in a live birth, 585 of the pregnancies resulted in a stillbirth or miscarriage, and 473 of the pregnancies ended in abortion.

Variable Coding

Dependent Variables

From the pregnancy histories two sets of dependent variables were created, one for each dataset. The first was a monthly variable coded one in the calendar months that a pregnancy began and zero otherwise. For pregnancies with a known outcome, a second dependent variable was created to indicate the outcome of a pregnancy. The possible resolution outcomes included live birth, induced abortion, or a miscarriage or stillbirth. Miscarriages and stillbirths were grouped together because of the small number of stillbirths that occurred (< 90) and because both events are for the most part random events.

[4] The predictor variables for this dataset were not lagged, and therefore the events were dropped if the state of residence during the month of conception was unknown. This discrepancy in lagging explains why six cases are dropped from the second dataset, which are included in the first dataset.

Independent Variables

Following the convention of Franklin (1988) and Murray (1995), the independent variables are grouped by level; whether they are individual, family, sociocultural, or social structural level variables. In addition, several measures of time are included which represent both individual level variables and as well as the passage of time. The following provides a brief description of the variable coding. A more complete description of the variable coding as well as the means and standard deviations for the independent variables is provided in Appendix 1.

Measures of time

Date of Birth. This variable indicates the century month in which the respondent was born. January, 1980 = 1; February, 1980 = 2; etc. Though this variable was not used as a predictor in the analysis, it was used for the construction of several other variables.

Calendar Month. This variable signifies the calendar month for each month that an individual contributes to the sample. January, 1997 = 205; February, 1997 = 206; etc.

Age in January, 1997. This variable represents a respondent's age in months in January, 1997 and was calculated by subtracting a respondent's month of birth from 205, the calendar month value for January, 1997.

Months at Risk. For each month a respondent contributes to the analysis, this variable indicates the number of months an individual has been at risk for a pregnancy. This variable was calculated as the number of months since the end of their last pregnancy. If a respondent had not ever been pregnant in that month then this variable was calculated as the number of months since they turned 150 months old.

Individual level variables

Individual level characteristics were taken from the NLSY97 include both fixed and time varying variables.

Race. A series of dummy codes were created to indicate the respondents' race. The categories include African American, Hispanic, and mixed race or other, with White as the reference category.

Age at Menarche. This variable records a respondent's age in months when she experienced her first menstrual cycle.

Age at First Sex. This variable records the respondents' age in years at first consensual sexual intercourse.

CAT-ASVAB. During the first round of the interview the majority of the respondents completed the computer-adaptive form of the *Armed Services Vocational Aptitude Battery (CAT-ASVAB).* The ASVAB measures respondents' abilities in several topical areas and is a rough measure of their intelligence and academic achievement and aptitude (CHRR, 2006). The NLSY staff used sample weights and respondent's scores on the Mathematical Knowledge, Arithmetic Reasoning, Word Knowledge, and Paragraph Comprehension sections of the ASVAB in order to create a general, age-normed, percentile score for each respondent that completed the test.

Previous Pregnancies. For each month in the sample, a set of variables indicates the number of previous births, abortions, and stillbirths/miscarriages a female respondent has experienced prior to that month.

Employment. Starting with the week an individual turns 14 years of age, the NLSY97 contains a weekly event history variable that determines the employment status of an individual.

The weekly variables were collapsed into monthly variables, and a dummy code was created to indicate whether respondents had worked at all during the month.

Educational Enrollment. Beginning with the month of the first survey and until the month of the last interview, the NLSY97 contains a monthly created variable that indicates a respondent's school enrollment status. Using this information, a monthly dummy code was created to indicate whether respondents were enrolled in some type of formal educational program in that month.

Educational Attainment. The NLSY97 contains a series of created variables that indicate the calendar month in which respondents receive a GED, High School Diploma, Vocational Training Certificate, Associate's Degree, or Bachelor's Degree. Using these variables, I created a set of dummy variables that indicate for each month a respondent contributes to the study whether an individual has received a particular degree. For example, one variable is coded 0 in the months before a respondent receives a high school diploma, but 1 in the month they receive this degree and every month after that. For any given month a respondent may have a high school diploma, an associate's degree, and a bachelor's degree, and therefore be given a score of 1 on each of these three variables.

Family level variables

Family level characteristics were taken from the NLSY97 include both fixed and time varying variables.

Biological Mother's Age at First Birth. Age in year's that the respondent's biological mother had first given birth.

Biological Mother's Educational Attainment. During the first wave of data collection either a respondent's parent or a respondent herself reported the number of years of education completed by the respondent's biological mother. From this a series of dummy codes was created. The categories included less than high school, high school, some college, and college degree or more. A final category was created for those whose mother's educational attainment was unknown. For most of the analyses, the high school diploma was the reference category.

Family Structure at Age 6. During the first interview the respondent's parent provided the family structure of the respondent when they were six years old. From this information a dummy code was created indicating whether or not the respondent lived with both of her biological parents at age six.

Cohabitation and Marriage. For each month from when a respondent turns 14 years old until the month of her last interview, the NLSY97 creates a variable that indicates whether she is residing with a cohabiting partner or with a spouse. These variables were used to create a set of marriage and cohabitation variables for each month that an individual contributed to the study. In months when a respondent was cohabiting with a romantic partner they were coded as 1 for the cohabitation variable and zero during all other months in which they were not cohabiting. In months when a respondent was residing with a married partner they were coded as 1 for the marriage variable and zero in months when they were not residing with a married partner.

Public Assistance. Beginning with the month that a respondent turns age fourteen through the month of her final interview, the NLSY97 creates a monthly variable that indicates whether she received various types of public assistance during that month. I created a monthly dummy code to indicate for each respondent the months in which they reported receiving either AFDC or TANF funds. I created a second monthly dummy code to indicate whether or not a respondent

received either food stamps or WIC in a give calendar month. In the months before a respondent turned age 14 it was assumed that she did not receive public assistance, though it is possible that her family of origin may have received these government transfers.

Sociocultural level variables.

Religious Affiliation. During the first interview respondents reported their current religious affiliation. From this two dummy codes were created indicating whether a respondent identified as Catholic or as agnostic, atheist, or not having any religious affiliation.

Social structural level variables

The main social structural variables included in the analysis were individuals' state of residence and the related policy variables for that state (see Chapter Four). The welfare policy data was obtained from the Urban Institute's Welfare Rules Database (WRD; Urban Institute, 2007), and the data on abortion policies were taken from *Who Decides?*, a yearly publication produced by NARAL Pro-Choice America. All of the state policies are coded in the direction of stringency.

State of Residence. Using the state of residence from each interview and the information on migration collected at each wave of data, for each eligible person month that a respondent contributes to the analysis, it was possible to calculate their state of residence for that month. In order to control for unmeasured characteristics of the states beyond those of the state policy variables, a series of state fixed effects dummy codes for each state were also include in the analyses.

Family Cap. This variable is coded one in the months that a respondent resides in a state with a family cap law, and zero otherwise.

Eligibility of Pregnant Women. This variable is coded one in the months that a respond resides in a state where a current pregnancy is not used to determine welfare eligibility.

Maximum State Benefit Amounts. This variable indicates the generosity of state cash benefit amounts relative to wages. Low values on this variable represent states that pay generous welfare benefits, relative to average wages. High values represent stringent states where the average benefit is small compared to average state wages (see Chapter Four for details on the coding of this variable). An alternative dichotomous variable is equal to one in the months that a respondent resides in a state where the raw dollar benefit amount divided by average wages is less than the sample median value for that month and equal to zero if the respondent resides in a state where the raw dollar benefit amount divided by average wages is greater than or equal to the median for that month.

Public Funding of Abortion. This variable is coded one in months when a respondent resides in a state where public funds can be used to cover the costs of non-medically necessary abortions, and zero otherwise.

Parental Involvement Laws. This variable is coded one in the months when a respondent resides in a state that has a parental involvement law and zero in the months when they do not reside in a state with a parental involvement law.

Informed Consent Laws. This variable is coded one in months when a respondent resides in a state that has an informed consent law and zero in all other months.

Waiting Periods. This variable is coded one in months when a respondent resides in a state that mandates that women wait a designated amount of time before receiving an abortion and zero otherwise.

State Welfare Policy Stringency Scores. One of the summary score variables indicates the number of stringent welfare policies that a woman's state of residence has adopted for a given month ranging from zero (no stringent welfare policies adopted) to three (all possible welfare policies adopted). A second variable is coded one in months that a woman resides in a state that is considered to be generally stringent (the state enforces two or more stringent welfare policies) and zero otherwise.

State Abortion Policy Stringency Scores. One of the summary score variables indicates the number of stringent abortion policies that a woman's state of residence is enforcing for a given month ranging from zero (no stringent abortion policies enforced) to four (all possible abortion policies adopted). A second variable is coded one in months that a woman resides in a state that is considered to be generally stringent (the state enforces two or more stringent abortion policies) and zero otherwise.

State Welfare and Abortion Policy Interaction Terms. These variables represent a set of dummy codes that were coded in two alternative—though mathematically similar—fashions. Though these two coding schemes lead to mathematically identical results, the interpretation of the coefficients is slightly different in each case. The first set involved the dichotomous state welfare policy stringency score and the dichotomous state abortion policy stringency score, as outlined above. In regression analysis, these coefficients represent the main effects for stringent welfare and abortion policies. A third interaction term is also included. The interaction term was coded one in months that a respondent resides in a state that was generally stringent on both

welfare and abortion policies and zero otherwise; and represents the effects of residing in a state where both policies are stringent, above and beyond the two main effects for welfare and abortion stringency. The second method of coding was to create a set of interaction terms. The first dummy code was coded one in months that a respondent resides in a state that was generally stringent on both welfare and abortion policies, and zero otherwise, identical to the interaction term above. The second dummy code was coded one in months that a respondent resides in a state that was stringent on welfare but lenient on abortion, and zero otherwise. The third term was coded one in months that a respondent resides in a state that was lenient on welfare but stringent on abortion, and zero otherwise. The reference category was therefore months that a respondent resides in a state that was lenient on both abortion and welfare. Instead of reflecting main effects and interaction effects, these coefficients represent the effects of residing in a state with a particular policy stringency typology (stringent on abortion only, stringent on welfare only, stringent on both) relative to living in a state that was lenient on both welfare and abortion policy.

Table 5.1. NLSY97 Interview Schedule and Number of Respondents Interviewed in Waves 1-8.

1997	1998	1999	2000	2001	2002	2003	2004	2005
Jan	Jan	Jan	Jan	Jan	Jan	Jan	Jan	Jan
Feb	Feb	Feb	Feb	Feb	Feb	Feb	Feb	Feb
Mar	Mar	Mar	Mar	Mar	Mar	Mar	Mar	Mar
Apr	Apr	Apr	Apr	Apr	Apr	Apr	Apr	Apr
May	May	May	May	May	May	May	May	May
Jun	Jun	Jun	Jun	Jun	Jun	Jun	Jun	Jun
Jul	Jul	Jul	Jul	Jul	Jul	Jul	Jul	Jul
Aug	Aug	Aug	Aug	Aug	Aug	Aug	Aug	Aug
Sep	Sep	Sep	Sep	Sep	Sep	Sep	Sep	Sep
Oct	Oct	Oct	Oct	Oct	Oct	Oct	Oct	Oct
Nov	Nov	Nov	Nov	Nov	Nov	Nov	Nov	Nov
Dec	Dec	Dec	Dec	Dec	Dec	Dec	Dec	Dec

	Interview Wave							
	1997	1998	1999	2000	2001	2002	2003	2004
Number of Respondents	4385	4103	4039	3964	3894	3899	3827	3770
Percent of Sample	100.0	93.6	92.1	90.4	88.8	88.9	87.3	86.0

With the exception of the 1997 wave, interview waves typically started in the fall of each year and lasted until spring or summer of the following year (e.g. interviews for the 2004 wave began in October 2004 and ended in July 2005). Highlighted months represent months in which interviews were conducted. Light-colored months represent interviews from odd year waves (e.g. 1997), while the darker months represent even year waves (e.g. 2000).

Table 5.2. Number of Interviews Completed by the NLSY97 Female Respondents.

Total Number of Interviews Completed:	Number of Respondents	Percent of Sample
One	75	1.7
Two	72	1.6
Three	95	2.2
Four	114	2.6
Five	153	3.5
Six	212	4.8
Seven	428	9.8
Eight	3236	73.8
Total	4385	100%

Number of Interviews Completed	Number of Respondents	Percent of Sample
One or more	4385	100%
Two or more	4310	98.3
Three or more	4238	96.6
Four or more	4143	94.5
Five or more	4029	91.9
Six or more	3876	88.4
Seven or more	3664	83.6
All Eight	3236	73.8

Average Number of Interviews Completed per Respondent:	7.27

Table 5.3. Demographic Characteristics of the Women in the NSLY97 (N = 4,385).

	Percentage
Year of Birth	
1980	19.86
1981	20.02
1982	20.28
1983	19.78
1984	20.06
Race	
White/Caucasian	67.03
African American	15.46
Hispanic	11.78
Mixed Race/Other	5.74
Region of Residence at First Interview*	
Northeast	17.75
North Central	25.99
South	30.86
West	25.38
Religion	
Catholic	24.68
No Religion	12.03
Other Religion	63.29
Lived with both biological parents at age 6**	
Yes	48.25
No	51.75
Educational Attainment of Biological Mother	
Less than High School	16.97
High School/GED	33.83
Some College	23.86
Bachelor's Degree or More	18.49
Unknown***	6.85
Biological Mother's Age at First Birth	
< 15 years	0.54
15-17	7.44
18-19	13.85
20-24	37.26
25-29	23.83
30+	10.15
Unknown***	6.92

All percentages reported here represent weighted percentages based on the Wave 1 sampling weight provided by BLS.
*The BLS defines the regions for the NLSY97 as follows: Northeast) CT, ME, MA, NH, NJ, NY, PA, RI, VT; North Central) IL, IN, IA KS, MI, MN, MO, NE, ND, OH, SD, WI; South) AL, AR, DE, DC, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV; and, West) AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY.
**Data for these items are taken from the parent questionnaire; therefore, this percentage is based only on information from the 88.8% of respondents whose parent completed the parent questionnaire.
***Respondents had missing data on these variables for various reasons (e.g. they had been adopted, didn't know, etc.).

CHAPTER SIX: Predictors of Pregnancy

This chapter aims to answer the following question: What personal, familial, and contextual variables are associated with the likelihood of pregnancy among young women? More specifically, after controlling for other individual and background influences, do state family formation related welfare policies and state abortion policies affect the likelihood of pregnancy among a sample of young women? The following provides a brief review of the research questions and hypotheses, outlines the research design and method of statistical analysis, reports and interprets the research findings, and discusses the validity and significance of the study.

Research Questions and Hypotheses

Economic theory suggests that the decision or the event of becoming pregnant can be modeled as a rational choice (Becker, 1991). The model assumes that when faced with a decision, actors select one of several options based on what is most rational for them given their history, current situation, and current information about available options and programs and their impact on the actors' future ambitions. Though the rational choice model typically focuses on economic incentives, multiple factors can influence each of these decisions.

Bronfenbrenner's (1979) ecological model of human development provides a useful framework for examining the many factors that may influence young women's decisions to conceive (see also Corcoran, 1999). According to the ecological model, individual development is shaped by the interaction of one's personal characteristics and his or her environment. Moreover, there are multiple levels of environmental influence ranging from direct interaction

with one's parents to the broad customs, laws, and ideology of one's culture (Bronfenbrenner & Morris, 1998).

Predictors of pregnancy can be grouped into four levels: individual, family, sociocultural, and social structural (Franklin, 1988; Murray, 1995). Individual level factors are variables that describe the individual characteristics of a respondent, such as age, intelligence, race, and education. Family level factors include previous and current family characteristics that may shape an individual's decision making processes, including family structure, family background characteristics, and measures of family SES. Sociocultural factors include forces that families or individual directly participate in that shape their values and belief systems, such as religious institutions. Social structural factors represent the role of larger social institutions and regulations, such as welfare laws and access to abortion providers.

The key focus of this analysis is the impact of social structural factors—specifically state family formation related welfare policies and state abortion policies—on the likelihood of pregnancy. Economic theory suggests that policies which lower the potential cost of a pregnancy will increase the likelihood of a pregnancy; whereas policies which raise the potential cost of a pregnancy will tend to decrease the likelihood of a pregnancy. For example, a guaranteed welfare benefit for children born to poor mothers helps to offset the potential costs of a pregnancy for these women. Economic theory suggests that such policies would thereby increase the likelihood of a pregnancy. On the other hand, policies such as a family cap, where no additional benefits are accrued for an additional pregnancy, would tend to raise the relative future cost of subsequent pregnancies for women currently receiving benefits, thereby reducing their likelihood of a subsequent pregnancy.

The costs associated with raising a child are not the only potential costs of a pregnancy, as pregnant women can also elect to have an abortion. For some women, the potential costs of pregnancy are essentially the same as the cost of abortion, as abortion is what they would choose to do in the event of a pregnancy. For these women, economic theory would predict that any policies which raise the cost of abortion would indirectly raise the costs of pregnancy, and therefore reduce the likelihood of pregnancy. For example, using public funds to cover abortion procedures would lower the cost of abortion, thus making pregnancy more affordable and more likely. On the other hand, mandatory waiting periods and informed consent laws would tend to raise the costs of an abortion, thereby making both abortion and pregnancy less likely. Under these scenarios, stringent welfare policies and stringent abortion policies both raise the future costs of a pregnancy, and therefore would be expected to reduce the likelihood of pregnancy.

Based on the findings of previous research and economic theories of rational choice, I hypothesize the following relationships:

H1: Individual, family, and sociocultural factors are related to the likelihood of pregnancy among young women.

H2: After controlling for the effects of other factors, state family formation related welfare policies and abortion policies are related to the likelihood of pregnancy among young women.

H2a: Stringent state family formation related welfare policies will decrease the likelihood of pregnancy among young women.

H2a1: Young women residing in states with a family cap policy will have lower odds of pregnancy.

H2a1a: The effects of a family cap policy will be stronger for women who already have a child than for women with no children.

H2a2: Young women residing in states where a current pregnancy is not counted towards welfare eligibility will have lower odds of pregnancy than young women residing in states without this policy.

H2a3: Young women residing in states with a relatively low maximum cash benefit amount will have lower odds of pregnancy than young women residing in states with a relatively high maximum cash benefit amount.

H2a4: Young women residing in stringent welfare states will have lower odds of pregnancy than young women residing in lenient welfare states.

H2a5: Young women residing in states with multiple stringent family-formation related welfare policies will have lower odds of pregnancy than young women residing in states with few or no stringent welfare policies.

H2b: Stringent state abortion policies will decrease the likelihood of pregnancy among young women.

H2b1: Young women residing in states where public funds may not be used to pay for abortion will have lower odds of pregnancy than young women residing in states where public funds are available for abortion.

H2b1a: The effects of public funding of abortion will be stronger for women on welfare than for other women.

H2b2: Young women residing in states with a parental involvement law will have lower odds of pregnancy than young women residing in states without a parental involvement law.

H2b2a: The effects of parental involvement laws will be stronger for minors than for older women.

H2b3: Young women residing in states with a mandatory waiting period before abortion will have lower odds of pregnancy than young women residing in states without a mandatory waiting period.

H2b4: Young women residing in states with mandatory informed consent procedures will have lower odds of pregnancy than young women residing in states without mandatory informed consent procedures.

H2b5: Young women residing in stringent abortion states will have lower odds of pregnancy than young women residing in lenient abortion states.

H2b6: Young women residing in states with multiple stringent abortion policies will have lower odds of pregnancy than young women residing in states with few or no stringent abortion policies.

H2c: The overall effects of state welfare and abortion policy stringency on young women's likelihood of pregnancy will be additive.

H2c1: Pregnancy will be the most likely among women residing in states with lenient welfare and lenient abortion policies.

H2c2: Pregnancy will be the least likely among women residing in states with stringent welfare and stringent abortion policies.

Analysis Strategy

Based on the above hypotheses, the analysis will consists of two parts. The first part will identify a set of significant individual, family, and sociocultural variables associated with the likelihood of pregnancy. The second part will estimate the effects of state policies on the likelihood of pregnancy, after accounting for the established set of background and contextual variables. Data for the analysis come from the pregnancy histories of young women from the National Longitudinal Survey of Youth 1997 cohort. The following provides only a limited description of the variables involved in the analyses, as a complete description of the data and variable coding can be found in Chapter Five.

Person level independent variables include measures of age, race, intelligence, education, age at menarche and first sexual experience, as well as measures of employment, school enrollment, educational attainment, and prior fecundity. Family level independent variables include mother's age at first birth and educational attainment, childhood family structure, current marital and cohabitation status, as well as the receipt of public assistance. The sociocultural independent variables include religious affiliation. Lastly, the social structural independent variables include measures of state welfare and abortion policy stringency. In some models, state fixed effects dummy codes are also included in order to account for unmeasured state level heterogeneity in social structural variables (Snijders & Bosker, 1999).

For each of the hypotheses outlined above, the key outcome of interest is the likelihood of pregnancy. For this particular analysis, however, the outcome must be more narrowly defined as the likelihood of pregnancy within a given month. This is because the timing of pregnancy matters for these women, as many of the variables hypothesized to affect the likelihood of pregnancy change from month to month. During the eight years of the analysis, some of these

women transitioned from junior high to high-school, to college, and beyond. Therefore, not only did they themselves age, but many of the other contextual factors such as educational attainment, employment status, and marital status were also likely to change. Moreover, many of the women resided in states with changing welfare and abortion policies, or moved to and from states with differing policies. Therefore, the statistical analysis needs to account for the timing of pregnancies, as well as the effects of time variant predictors.

Event history analysis provides a powerful method for examining the predictors of the timing of events. Given that the analyses involve discrete time periods (months) and incorporate time varying covariates, discrete time hazard models estimated with logistic regression procedures provide an efficient and flexible method for estimating the relative effects of factors associated with the likelihood of pregnancy (Allison, 1995). The general model for this analysis is as follows:

$$\text{Probability (pregnant in month}_t = \text{yes} \mid x_{it-1}) = \frac{\exp(\alpha + \beta_i x_{it-1})}{1 + \exp(\alpha + \beta_i x_{it-1})}$$

In this model, the probability that a woman gets pregnant in month *t* is a function of her values on a series of predictor variables, x_i, in the previous month, *t-1*. The predictor variables are lagged 1 month to control for changes in contextual factors that may have occurred within the same month as a conception, as a result of the conception (e.g. leaving work upon discovering a pregnancy). One advantage of using this method is that with an exponential transformation, the estimated coefficients, β_i, can be transformed into odds ratios in order to provide a more consistent and intuitive metric for comparing the relative effect sizes of each predictor variable (Allison, 1995).

Though this method of event history modeling is appropriate and appealing for modeling discrete time events with time variant predictors, given the nature of the data involved in this

analysis, some key challenges must be addressed. These challenges include estimating the probabilities of rare events, accounting for the contribution of multiple events by each respondent, accounting for the effects of multiple episodes from the same respondents, and selecting appropriate measures of time.

King and Zeng (2001) argue that in situations where the rate of occurrence of a specific binary event is rare relative to the rate of non-occurrence, logistic regression procedures may underestimate the probability of the event occurring. The analyses reported here are based on a total of 375,884 individual person months, with pregnancies occurring in only 3,497 months (less than 1%). However, King and Zeng also suggest that these concerns may only apply when the actual occurrence of an event is rare (e.g. the diagnosis of a rare disease, or the impeachment of a president), as opposed to when an event occurrence appears rare as a result of the structure of the data. In this case, the actual occurrence of a pregnancy is a common event and over 43% of the women in the sample experienced a pregnancy. In addition, Vittinghoff and McCulloch (2007) argue that having at least 10 events for each predictor variable in the model should adequately address any concerns about underestimation associated with rare events in logistic regression and event history analysis. In this study, roughly 3,500 pregnancy events occur, and even the most complex, fully specified models have fewer than 100 predictor variables (50 state fixed effects dummy variables, multiple background controls, all of the policy measures, etc.), suggesting that the perceived rare occurrence of pregnancy in the data should not lead to an underestimation of the probability of pregnancy.

Another challenge with using logistic regression to calculate event histories is that each respondent contributes multiple observations. In traditional event history models, each respondent contributes a single observation, and the timing of an event is indicated with a

duration variable. In most cases, each observation is independent of other observations. In the logistic regression models, each respondent contributes a line of data for each month that they are in the sample. Therefore, each respondent contributes multiple observations that are not independent from one another. In this study, each respondent contributes an average of 86 person months. In order to account for the lack of independence among the observations, the final analyses were estimated using the logistic function in STATA 9SE (StataCorp, 2005), and the standard errors were adjusted by clustering the observations within individuals by using the cluster command.

In addition to contributing multiple person months to the analysis, some respondents also contribute multiple pregnancy-risk episodes. This is important because the only people with multiple pregnancy episodes are those who experience a pregnancy during the months of the study. It is likely that having a pregnancy is related to the probability of having another pregnancy. One way to account for this would be to include a variable that indicates the episode number or the number of previous pregnancies. However, this variable assumes that the effect of each additional pregnancy is linear; or in other words, the effect of moving from one pregnancy to two is the same as the effect of moving from three pregnancies to four, which is unlikely. Moreover, not only would differences in the number of pregnancies matter, but the type of pregnancy is also likely to have an effect. For example, a woman who wants a child but experiences a miscarriage is probably more likely to have an additional pregnancy when compared to a woman who wants a child and has a live birth. To account for multiple episodes, as well as the type of previous pregnancies, a single variable reporting the number of pregnancies was divided into a set of three variables designating the number of previous live births, previous miscarriages and stillbirths, and previous abortions that a woman had experienced. These three

variables are a linear combination of the total number of pregnancies, and can therefore take the place of this single variable, while also providing additional qualitative information.

An additional challenge with using logistic regression techniques to model event histories is accounting for the effects of time. In traditional event history analyses, the duration variable implicitly accounts for the passage of time and episode length; however, in a logistic regression framework, time and episode length must be explicitly modeled. The matter is further complicated by the fact that there are several ways of coding time, and each one runs the risk of being highly co-linear with other important measures, such as age, that are related to time.

In this particular analysis, the coding of time presented some difficult challenges. Because states tended to pass more stringent welfare and abortion legislation as time progressed from January 1997 to December 2004, it was necessary to control for this period effect by accounting for each passing calendar month. However, the respondent's age was also likely to affect their risk of pregnancy, as pregnancy rates tend to increase from the early teens to the late twenties (Martin et al., 2007). The women in our sample aged from their teens to their mid to late twenties during the period of the study; therefore it was necessary to account for the age changes of the sample. However, a respondents age in months during a given month, tended to correlate highly with a measure of the calendar month (r = .85), thus both measures could not be included in the model. It was also important to get a measure of the length of an episode, or the current number of months a woman had been at risk for a pregnancy, because the longer a woman had gone without a pregnancy, the more likely she was to continue without a pregnancy. However, this variable was likely to be highly correlated with the calendar month, especially for women with no pregnancies; as well as correlated with the number of pregnancy episodes, as only women with few episodes would have long duration lengths.

After exploring several alternative methods of coding the various time, age and episode measures, as well as the correlations between them, I decided to include the following in the final models:

1) The calendar month. This was a time varying variable designating the calendar month to which each individual person month pertained. This variable helps to account for period effects experienced by the entire sample, as well as the overall aging of the sample.
2) Age in months in January 1997. This was a fixed variable. Given the restrictions on the age of the sample, the older women would always have higher pregnancy rates than the younger women throughout the entire time frame of the study. This variable accounts for that effect.
3) The number of previous births, previous stillbirths and miscarriages, and previous abortions a woman had experienced. These are time varying variables which in combination provide a measure of the episode number, while adding additional qualitative information.
4) The number of months at risk for a pregnancy. This is a time varying variable that indicates the episode length for each episode in the sample.

Table 6.1 displays the correlations between these measures of time, age, and episode. None of the correlations are higher than .45, suggesting that multicolinearity among these measures does not pose a threat to the stability of later statistical analyses. A more detailed description of the creation and coding of these variables can be found in Chapter Five. Because the influence of time is essential to event history analysis, the time, age, and episode variables are included in all subsequent analyses.

Results

Time, Person Level, Family Level, and Sociocultural Level Predictors

Which personal, family, and sociocultural variables are associated with the likelihood of pregnancy? The first column in Table 6.2 contains the results of the univariate relationships between the predictor variables and the likelihood of pregnancy in a given month. In each case, I estimated the effects of a single predictor on the likelihood of pregnancy, after controlling for the time and episode variables. As expected, for each additional month of time that passed the women in the sample were more likely to get pregnant. Moreover, older women were more likely to get pregnant than younger women. Having had a previous abortion or miscarriage significantly increased the women's odds of getting pregnant, whereas each month they went without getting pregnant their odds of pregnancy decreased.

For the personal level variables, Black and Hispanic women had higher odds of pregnancy than White women. Delays in age at menarche and age at first sexual intercourse were associated with decreased odds of pregnancy in a given month. Moreover, girls with higher percentile scores on the ASVAB were less likely to get pregnant, as were girls who were currently enrolled in school. In addition, with the exception of girls with a GED, girls with educational certificates were less likely to get pregnant than girls without them.

Moving to the family level variables, women who had lived with both biological parents at age six were less likely to get pregnant, as were woman whose mothers had delayed childbearing. Additionally, compared with woman whose mother had only a high school diploma, women whose mother's had not finished high school or whose mother's educational attainment was unknown were more likely to get pregnant, while women whose mothers had completed at least some college were less likely to get pregnant. Girls who had formed their

own families either through cohabitation or marriage also faced greater odds of pregnancy. Lastly, receiving either cash assistance or food stamps was associated with greater odds of pregnancy.

The only sociocultural variables included were whether or not a woman identified as Catholic and whether or not she reported no religious affiliation. Neither of these variables was significantly related to a woman's odds of pregnancy in a given month.

The second set of estimates in Table 6.2 is the result of a multivariate model, where all of the predictors were estimated simultaneously. Most of the relationships were similar to those found in the univariate models, with a few exceptions. In contrast to the univariate models, in the multivariate model previous births were associated with a significant decrease in a woman's odds of pregnancy. Moreover, at the person level, age at menarche was no longer significantly related to the odds of pregnancy, while current employment was. Additionally, of the measures of educational attainment, only the receipt of a bachelor's degree was related to the likelihood of pregnancy. At the family level, a few of the contrasts for mother's education were no longer significant, but other than that, the estimates were typically in the same direction and magnitude as in the univariate analyses.

Having established which personal, family, and sociocultural variables were associated with a change in the odds of pregnancy, I wanted to create an optimal trimmed model for use in later tests of the effects of policy variables. I trimmed the full multivariate model through a series of stepwise deletions. I began by dropping the least significant variables and then comparing the change in the AIC. If the AIC changed little or improved, the non-significant variable was dropped. In no instances did the AIC grow as a result of non-significant variables that were dropped from the model (not shown). The variables were dropped in this order: 1) the

racial category mixed/other was collapsed into the White category; 2) all of the individual measures of educational attainment were dropped sequentially, except of the receipt of a bachelor's degree; 3) the sociocultural measures of religious identification were dropped; 4) age at menarche was dropped; and, 5) Mothers education was collapsed into two categories, less than high school diploma, and college graduate, all others were in the reference category.

Table 6.3 contains the estimates of the odds ratios for the likelihood of pregnancy for the final trimmed covariates model. Examining the measures of time and episode, for each month after January 1997 the odds of pregnancy increased by 0.5% for the women in the sample. Given that the study period was 96 months long, this would suggest that the odds of pregnancy for the women in the sample was about 48% greater in December 2004 than in January 1997, after accounting for other factors. This is not surprising given that most of these women aged from their mid-teens to their early- to mid-twenties during this time period, and pregnancy rates tend to increase over the same age intervals (Martin et al., 2007). Further evidence of this can be found by the fact respondents who were older at the start of the study faced a greater odds of pregnancy throughout the eight year time frame when compared to their younger counterparts. Each additional month of age in January 1997 increased a woman's odds of pregnancy by 1.2 % for any given month of observation. Though the odds of pregnancy in the sample increased for each additional calendar month, the effects were not the same for all women. In fact, not getting pregnant could largely offset the effects of the passage of time. For each month that an individual woman went without getting pregnant, her odds of getting pregnant in the subsequent month decreased by about 0.6%.

Not surprisingly, previous pregnancies—which result in shorter episode lengths for the risk of subsequent pregnancies—were found to be associated with the likelihood of subsequent

pregnancies. For each abortion a woman had obtained, her odds of a subsequent pregnancy increased by 17%; whereas, each miscarriage a woman experienced was associated with a 24% increase in the odds of a subsequent pregnancy. On the other hand, previous births reduced a woman's odds of subsequent pregnancy by about 33% per live birth. The results for births and miscarriages are intuitive, a woman who wants a child but experiences a miscarriage is probably more likely to have an addition pregnancy when compared to a woman who wants a child and has a live birth. The results for abortion are probably partially explained by the fact that some sexually active women use abortion instead of contraception as a form of birth control (Marston & Cleland, 2003).

As expected, several person level variables also had an effect on a woman's likelihood of pregnancy. The odds of pregnancy were about 23% greater for Blacks and 12% greater for Hispanics than for woman from other racial groups. These results are consistent with differences in pregnancy rates by race that are often observed in vital statistics data (Martin et al., 2007). Also consistent with pervious research, women who delayed the onset of sexual intercourse had lower odds of pregnancy than those who began having sex at an early age (Kirby, Lepore, & Ryan, 2005). In this analysis, each year a woman delayed sexual onset decreased her odds of pregnancy in a given month by about 12%. Current employment increased a woman's odds of pregnancy in a subsequent month by about 15%, but it is difficult to interpret what exactly this relationship means given the other variables in the model, other than to say that employment was a risk factor for pregnancy. Similar to previous studies, education was also associated with the odds of pregnancy. Current school enrollment decreased a woman's odds of pregnancy in a subsequent month by about 42%, while women who had completed a Bachelor's degree faced about half the odds of pregnancy when compared to women who had not graduated from college.

Lastly, women with higher scores on the ASVAB, a measure of aptitude, had lower odds of pregnancy when compared to women with lower ASVAB scores. For each one point increase in a woman's ASVAB percentile score, her odds of pregnancy in a given month decreased by 0.9%. To put this in perspective, the odds of pregnancy for a woman who scored in the 90th percentile were about 36% lower than the odds for a woman who scored in the 50th percentile.

Family level factors were also associated in the expected directions with a woman's odds of getting pregnant in a given month. The odds of pregnancy among women who had lived with both biological parents at age six were about 22% lower than for woman who had not lived with both parents at age six. Moreover, women whose mothers had delayed childbearing faced a 1.7 percent decrease in their odds of getting pregnant for each year that their mothers had waited to have children. Additionally, compared with women whose mother had completed high school but not college, women whose mother's had not finished high school were about 11% more likely to get pregnant, while women whose mothers had graduated from college were 29% less likely to get pregnant. Not surprisingly, women who resided with their romantic partners had greater odds of pregnancy than those living without a romantic partner. Cohabiters were about twice as likely to get pregnant, while married woman were about 2.3 times as likely to get pregnant. This is probably largely due to the increased frequency of intercourse among cohabiters and married couples (Wellings et al., 2006), as well as an increased desire for children among these couples.

Finally, participating in WIC was associated with a 16% increase in a woman's odds of pregnancy in a given month, while receiving TANF payments was associated with a 29% increase in the odds of pregnancy. These estimates could represent several phenomenon, the most straight forward being an effect of welfare participation. Namely, women on welfare are

more likely to get pregnant. However, these variables may also be serving merely as markers for family income, suggesting that woman of meager means are more likely to get pregnant when compared with women of higher financial standing. It would have been nice to include measures of family income, however in the NLSY income is reported on a yearly basis only, and the time points do not match up for all of the participants, therefore, measures of income were not pursued. Because of this, estimates of the effects of program participation should be interpreted with caution.

Tests of Individual State Welfare and Abortion Policies

Having established which personal, family, and sociocultural variables were associated with the odds of pregnancy, the next task involved estimating the effects of state welfare and abortion policies on the likelihood of pregnancy. First, I estimated the effects for each individual state welfare and abortion policy separately, while controlling only for measures of time and episode. Next, I estimated the effects of all seven welfare and abortion policy variables together in order to control for any covariance among the effects of these policies. The results of this analysis can be found in Table 6.4 in the column for Model Set 1. Contrary to our expectations, residing in a state with a low maximum welfare benefit relative to wages or residing in a state with a parental involvement law for minors were both associated with an increase in a young woman's odds of pregnancy. None of the other individual policy variables were significantly related to the odds of pregnancy for the young women in the sample. When all of the policy variables were estimated simultaneously, a similar result emerged (results not shown)[1].

[1] I used the confidential NLSY97 geocode data from the BLS, which I was only licensed to use on certain computers at PRI. After leaving campus with the results, I could not find the estimates for models for the time covariates and all seven policy variables estimated simultaneously. I did not perform similar estimates with only the time covariates, and have therefore opted not to report these results here, thought they were similar to what was observed when the policies were estimates one at a time. I had originally planned to re-estimate these models; however, all of the coding I had stored on the PRI network was inadvertently deleted by the PRI staff. I could produce the proper coefficients, but it would take between 80 and 100 hours of additional coding on site at PRI.

In the next set of models, I estimated the effects of each individual state welfare and abortion policy on the likelihood of pregnancy while controlling for time, episode, and the individual- and family-level variables in the trimmed covariates model in Table 6.3. These results are reported in Table 6.4 under the heading for Model Set 2. In this case, residing in a state with a parental involvement law was associated with an 18% increase in the odds that a young woman would experience a pregnancy in a given month. None of the other individual policy variables were significantly associated with the likelihood of pregnancy, and once again, a nearly identical result emerged when estimating all of the policy variables together.

In addition to variations in their welfare and abortion policies, states may also vary in other key characteristics associated with a young woman's likelihood of pregnancy that are not accounted for in these estimation models. Some of these variables may include state pregnancy and marriage rates or overall attitudes about non-marital pregnancy, variables which may also be associated with the likelihood that states pass specific welfare and abortion legislation (see Greafe et al., 2008). In order to account for these unmeasured state differences, the final set of models estimates the effects of individual state welfare and abortion policies while using state fixed effects variables to account for these unmeasured state level factors. The results of these estimations are reported in Table 6.4 under the heading for Model Set 3. After controlling for unmeasured state variation, the odds of experiencing a pregnancy in a given month were 33% higher for young women residing in states with a family cap policy; and 25% lower for young women residing in a states that mandate informed consent before a woman can receive an abortion. No other state welfare and abortion policies were related to the odds of pregnancy in a given month. When the effects for all seven policy variables were estimated simultaneously, the

results were essentially identical, suggesting that the effects of the separate policies do not covary greatly.

In general, the effects of individual state welfare and abortion policies were not as robust as hypothesized, and in many cases the effects were in the opposite direction. For example, only four of the 21 estimated relationships were significant. Moreover, no single policy was significant across the three models; and, in three of the four observed significant relationships policy stringency was actually associated with an increase in the odds of pregnancy as opposed to the hypothesized decrease. Four factors may partially explain these observed results: a) it is possible that some specific policies were aimed at specific subgroups, and therefore measuring their effect on the entire population may mask a real effect; b) it is possible that specific state welfare and abortion policies may not be as important as overall state welfare and abortion policy stringency (see Chapter Two); c) it is possible that states with high rates of pregnancy tended to enact strict policies in response, and therefore, aggregate fertility decisions are driving public policy, as opposed to public policy driving individual pregnancy decisions (see Chapter Four); and, d) state welfare and abortion policies do not have an observable effect on the likelihood a young women will get pregnant in a given month.

Tests among Specific Subpopulations

Not all of the state welfare and abortion policies directly affect all members of the population. For example, parental involvement laws only apply to women under the age of 18. As discussed earlier, state welfare and abortion policies may have both a direct effect on young women's fertility decisions, or they may simply be a marker for general sentiment about family formation within the state. To determine whether these policies are having a direct effect, one can compare the effects of these policies on the target population to the effects of these policies

on the general population. Three policies which are targeted at specific populations include the family cap[2], public funding of abortion, and parental involvement laws.

The family cap policy states that women who have additional children while on welfare will receive little or no increase in their monthly cash assistance amount. Therefore, it is expected that this policy is likely to have a greater effect on women who already have at least one child when compared to women with no children[3]. To test this hypothesis I created an interaction term between the family cap variable and a variable that marked whether the respondent had previously given birth. As a result, this interaction term measures whether the effect of the family cap policy on the likelihood of pregnancy is different for mothers when compared to the effect of this policy on all women in the sample. The results of this analysis are displayed in Table 6.5. When only controlling for time and episode, the effect of the family cap policy has a significantly different effect on mothers than it does on women in general. Whereas the policy appears to have little effect on women in general, these data suggest that residing in a state with a family cap policy reduces the odds that mothers will get pregnant in a given month by thirteen percent. However, this effect appears to diminish when individual- and family-level variables are included in the model, and is no longer significant once state fixed effects are included. On the other hand, consistent with previous models, a significant effect of the family cap policy on all women emerges once state fixed effects are added to the model. The

[2] Admittedly, all three of the welfare policies are targeted at women who are at risk of someday participating in welfare programs, most likely those with lower incomes. However, the incomes of these women's households was measured on a yearly basis and given the monthly structure of the data and the assumed monthly variations in income given the ages of the women in the sample, it was impossible to construct a reliable measure of income for a given month. Moreover, though I had measures of their welfare participation in a given month, for most of these women, it was impossible to create a valid measure of their monthly risk of welfare participation. For this reason, the only welfare policy I have elected to examine is the family cap policy.

[3] I recognize that this is an imperfect comparison group. The ideal comparison group would be mothers with one or more children who are currently receiving TANF assistance, as opposed to all mothers with one or more children. However, so few women in the sample were receiving TANF in any given month that there were not enough cases to make this comparison. Therefore, it is likely that this analysis may also mask the true effects of family cap policies given that it is not comparing the true target group to the rest of the population.

emergence of a general effect of the family cap after the inclusion of the state fixed effects, especially in light of the diminished effects of the interaction term, is difficult to interpret in isolation.

Public funding of abortion was hypothesized to increase the likelihood that women get pregnant in a given month. However, this policy is likely to directly affect only women who may be eligible to receive this benefit. Therefore, in order to determine if this policy had a direct effect on the women's pregnancy decisions I tested whether this policy had a different effect on women who were on some type of public assistance, relative to the effect of this policy on women who were not on public assistance (see Table 6.5). In general, the public funding of abortion was only weakly associated with the odds of pregnancy for the general population of women, and the effect for women on welfare did not differ significantly from the main effect. In other words, this policy did not appear to be having a direct effect on the population most likely to be affected by it.

In previous models, I observed that parental involvement laws were related to the risk of pregnancy in a given month among the general sample. However, parental involvement laws only apply to women under age 18, so I wanted to compare if the effects of this policy were different for women under age 18 relative to women age 18 or older. These results are found in the bottom rows of Table 6.5. Though in general, minor respondents were less likely to get pregnant, parental involvement laws did not appear to differentially affect the odds of pregnancy of minor respondents, relative to the effects of these policies on the overall risk of pregnancy for the total sample.

Taken together, the results of these three tests of specific policies would suggest that specific state welfare and abortion policies are not having a direct affect on the odds that women

get pregnant. Perhaps this is because the policies do not operate in isolation, but are merely part of the overall stringency of state welfare and abortion policy.

Tests of State Welfare and Abortion Policy Stringency Typologies

In order to measure the effects of overall state welfare and abortion policy stringency, I estimated similar logistic regression models using state policy summary scores instead of the individual policy variables. For both the welfare and abortion policies, two separate summary scores were created (see Chapter Four). A respondent was coded as residing in a stringent welfare state if their state of residence had two or more stringent welfare policies in effect for that month. A respondent was coded as residing in a stringent abortion state if their state of residence had two or more stringent abortion policies in effect for that month. I also included a measure of the total number of stringent welfare policies in effect in a state during a given month (ranging from 0 to 3); as well as a measure of the total number of stringent abortion policies in effect in a state during a given month (ranging from 0 to 4). The effects for each of these variables was estimated in a separate set of models and the results are displayed in Table 6.6.

After controlling for only time and episode, residing in a stringent welfare state was associated with a 12% increase in the odds a respondent would get pregnant in a given month (see Table 6.6; Model Set 1). Moreover, residing in a stringent abortion state was associated with an 8% increase in the odds a respondent would get pregnant in a given month. On the other hand, neither the number of stringent state welfare policies nor the number of stringent state abortion policies was associated with a change in the odds of getting pregnant. After adding the person- and family-level covariates, residing in a stringent welfare state was no longer significantly related to the odds of reporting a pregnancy (see Table 6.6; Model Set 2). However, residing in a stringent abortion state was associated with an increase in the odds of pregnancy,

and each additional stringent state policy was associated with a 3% increase in the odds of pregnancy.

When the fixed effects were added to the model, those residing in a stringent welfare state were 67% more likely to report a pregnancy when compared with those residing in a state with non-stringent welfare policies. Moreover, each stringent welfare policy was associated with an 18% increase in the odds of reporting a pregnancy in a given month. For abortion, residing in a state with stringent abortion policies was associated with a decrease in the odds of reporting a pregnancy, and each stringent abortion policy a state adopted was associated with an 8% decrease in the odds a respond would report a pregnancy.

Tests of State Welfare and Abortion Policy Stringency Interactions

I argued in Chapter Two that the effects of welfare and abortion policy stringency may be interactive. In other words, the effects of welfare policy on pregnancy are likely to interact with the effects of abortion policy on pregnancy and vice versa. In order to test whether or not these policy effects are interactive, I estimated a series of logistic regression models using a similar pair of dummy codes. In the first set of dummy codes, a respondent was coded one if they lived in a stringent welfare state for that month and zero otherwise. In a separate dummy code a respondent was coded one if they lived in a stringent abortion state for that month and zero otherwise. A third dummy code consisted of the interaction between these two terms, coded one if a respondent was living in a stringent welfare state and a stringent abortion state and zero otherwise. I also used an alternate coding which produced identical results, but allowed me to compare the effects of living in various state types without having to multiply to coefficients from the first set of dummy codes. In this coding scheme, a series of four mutually exclusive dummy codes were used to designate which of the four stringent welfare/stringent abortion policy

combinations typified a respondent's state of residence in a particular month. For analysis purposes, residing in a lenient welfare and lenient abortion state was the reference category.

Similar to previous analyses, I began by controlling only for time and episode, then added the person and family level predictors, followed by the state fixed effects. The results of these estimation procedures are displayed in Table 6.7. When controlling for only time and episode, residing in a stringent welfare state or a stringent abortion state was associated with an increase in the odds of getting pregnant in a given month. However, the effects of these policies were not additive, and the coefficient for the interaction term was actually in the opposite direction of the two stringent policy main effects. As a result, young women residing in a stringent welfare state with lenient abortion policies were the most likely to get pregnant, followed by young women residing in a stringent welfare state with stringent abortion policies. The two state typologies with the lowest odds of pregnancy were those with lenient welfare policy. Moreover, contrary to my expectations, young women residing in states with both lenient welfare policy and lenient abortion policy actually had the lowest odds of pregnancy and not the highest odds. When I added the state fixed effects, residing in a stringent welfare state was also associated with an increase in the odds of pregnancy, but residing in a stringent abortion state no longer had a significant effect the likelihood of pregnancy.

Discussion

In this chapter I tested a series of related hypotheses. Table 6.8 contains a list of the hypothesis and the results of the statistical tests. I was able to confirm that individual, family, and sociocultural factors are related to the likelihood of pregnancy among young women. However, our tests of the effects of social structural factors—specifically state welfare and

abortion policy stringency—were mixed. In general, stringent family formation related welfare policies were associated with a significant increase in the odds of pregnancy, exactly the opposite of our predictions. Moreover, the effects of the individual policies were either zero, inconclusive, or in the opposite direction. I did not do much better in predicting the effects of state abortion policy stringency either, where the results were also mixed. For the most part, the specific state abortion policies had little measureable effect on the likelihood of pregnancy. Where I observed a significant effect for a particular abortion policy or abortion policy typology, it was either in the opposite direction (e.g. parental involvement laws and residing in a stringent abortion state) or observable only in the fixed effects models (e.g. informed consent laws and the number of abortion policies adopted by a state). Lastly, I found no evidence that the effects of welfare and abortion policy stringency on pregnancy are additive, and in fact, the coefficient was in the opposite direction of what I expected. Moreover I expected that young women residing in states that were lenient on both welfare and abortion policies would be at the greatest risk of pregnancy, but instead they had the lowest risk. In addition, I expected women from states strict on both policy measures would have the lowest likelihood of pregnancy, but instead they had the second highest.

As was discussed earlier, four factors may partially explain these observed results: a) it is possible that some specific policies were aimed at specific subgroups, and therefore measuring their effect on the entire population may mask any real effect; b) it is possible that specific state welfare and abortion policies may not be as important as overall state welfare and abortion policy stringency; c) it is possible that states with high rates of pregnancy tended to enact strict policies in response, and therefore, aggregate fertility decisions are driving public policy, as opposed to public policy driving individual pregnancy decisions; and, d) state welfare and

abortion policies do not have an observable effect on the likelihood a young woman will get pregnant in a given month.

In the three tests of the effects of specific policies on specific populations, I found little evidence that these policies had a differential effect on the target populations. The one exception was the family cap policy which appeared to reduce the likelihood of pregnancy among mothers, but this was an imprecise comparison group (see footnote 2, this chapter), and in the fixed effects models, this policy was actually associated with an increase in pregnancy for all groups. Therefore, it is an unlikely that examining the effects of these policies with the entire sample is masking real effects that exist in specific subpopulations.[4]

With regard to the second factor, I find that the policy summary scores tend to be better predictors of pregnancy than the individual state policies. For example, few of the specific policies are related to pregnancy, while seven of the twelve estimates for policy summary scores are significantly related to pregnancy (see Table 6.6). However, for the most part the effects of these summary scores are in the opposite direction of what I expected, with the exception of the number of abortion policies adopted by a state in the fixed effects models.

Though the effects of state abortion policy summary scores are mixed, it does appear that women in states with strict welfare policies were more likely to get pregnant. Moreover, this effect is fairly robust across several model specifications. It is difficult to imagine how stringent welfare policies would lead to an increase in pregnancies. A more likely explanation for these observed results is that states with high teen birth rates and high non-marital birth rates enacted the strictest family formation related welfare policies. In Chapter Four, I found a positive correlation between state teen birth rates and non-marital birth ratios and the stringency of their welfare policies. In other words, the states I coded as stringent on the welfare variables had

[4] At least that we are able to determine with this particular sample. A larger sample may make that a possibility.

higher than average rates of teen childbearing and non-marital births (see Table 4.4). Though I cannot definitively say whether state welfare policies are driven by state fertility behaviors, others have found this to be the case (Graefe et al., 2006). Moreover, given the grant structures in the TANF legislation, including the illegitimacy bonuses, states with high non-marital fertility had incentive to reduce pregnancies among young, primarily single women. Therefore, the welfare policies may not be driving fertility behaviors as much as fertility behaviors are driving welfare policies.

A fourth explanation that may partially explain these results is that state welfare and abortion policies do not have a direct effect on the likelihood young women will get pregnant in a given month. I cannot completely rule out this explanation based on the evidence provided by these analyses. Moreover, due to a few methodological shortcomings of this analysis, I cannot definitively determine whether state policies have an effect or not. Perhaps the greatest methodological limitation of this study is that it utilizes micro-level data to answer what is largely a macro-level question (Lee, 2001). Though this is a common methodology for addressing these types of questions, it is not always appropriate. State family formation related welfare policies and abortion policies are enacted at the state level with the intent of reducing state pregnancy rates. However, these data consist of individuals hypothesized to be making rational choices. Klerman (1998) argued that unless the sample size is sufficiently large, this methodology will either fail to find any effects for state welfare policies on individual fertility behaviors or will produce misleading results. This is because state level policies are best analyzed at the state level. A more precise method of measuring the effectiveness of state policies would be to look at changes in state level outcomes before and after the policies were implemented, as have New (2007) and others.

Though this sample is representative of young women at the national level, it is not necessarily representative of the populations of young women within each individual state, or representative of the populations of young women in stringent or lenient states, as the sample was not stratified on these variables. Given that the sample was not completely random, and also that state policies are not completely random, this makes it very difficult to determine if these policies are leading to differences in the odds of pregnancy between women in stringent and lenient states, or if underlying differences in the populations living in stringent and lenient states are responsible for any observed differences in the likelihood of pregnancy. I tried to correct for this phenomenon by including controls for personal and family level variables, thus reducing the effects of differences in population composition. I also included state fixed effects in the models. This allowed me to account for any unmeasured differences in the subpopulations of women from one state to the next state, but this does little to correct for underlying sampling differences between the states. Moreover, for states with little change in policy, the state fixed effects would have essentially eliminated the policy effects for these states.

The methodological caveats aside, this analysis does provide some helpful information. For one, the results suggest that women residing in states with stringent family formation related welfare policies face a greater risk of pregnancy than women living in states with lenient welfare policy. The results here suggest that in the years after the implementation of TANF, state family formation related behaviors may be driving state policy more than welfare policy is affecting family formation behaviors; though this idea should be investigated further with more appropriate data. In addition, these results suggest that state summary policy measures may be a better method of predicting individual fertility decisions than looking at the effects of individual policies. Moreover, there is some preliminary evidence that suggests that the effects of state

welfare and abortion policy are interactive. Having examined the factors associated with the likelihood of pregnancy, I now turn to factors associated the resolution of pregnancy among a sample of pregnant women.

Table 6.1. Correlations between Measures of Time (N = 375,884).

	Previous births	Previous abortions	Previous miscarriages	Age in January 1997	Calendar month
Previous abortions	0.1169				
Previous miscarriages	0.1738	0.0803			
Age in months in January 1997	0.1934	0.0907	0.0779		
Calendar month	0.2863	0.1202	0.1126	-0.004	
Months at risk for a pregnancy	-0.4212	-0.2012	-0.2211	0.2608	0.4518

Table 6.2. Odds Ratios for the Likelihood of Pregnancy: Individual and Family Characteristics.

Variables	Univariate Models†		Multivariate Model	
Measures of Time and Episode:				
Calendar month	1.014***	(1.012-1.016)	1.006***	(1.004-1.008)
Age in months in January 1997	1.018***	(1.015-1.020)	1.012***	(1.009-1.015)
Months at risk for a pregnancy	0.989***	(0.987-0.991)	0.994***	(0.992-0.996)
Previous births	0.961	(0.889-1.039)	0.660***	(0.594-0.733)
Previous abortions	1.198***	(1.120-1.281)	1.171***	(1.092-1.255)
Previous miscarriages	1.365***	(1.270-1.467)	1.232***	(1.164-1.303)
Person Level Variables:				
Race:				
Black	1.500***	(1.375-1.636)	1.224***	(1.104-1.357)
Hispanic	1.417***	(1.288-1.560)	1.164**	(1.038-1.306)
Mixed race/Other	1.101	(0.882-1.374)	1.045	(0.835-1.307)
White (reference)				
ASVAB percentile score	0.983***	(0.982-0.985)	0.992***	(0.989-0.994)
Age at menarche (months)	0.996***	(0.994-0.998)	0.999	(0.997-1.001)
Age 1st sex (years)	0.849***	(0.833-0.866)	0.880***	(0.863-0.898)
Currently employed	1.052	(0.971-1.139)	1.155***	(1.063-1.256)
Currently enrolled in school	0.382***	(0.344-0.423)	0.582***	(0.522-0.648)
Academic Degrees Obtained:				
GED	1.305***	(1.125-1.513)	1.019	(0.862-1.204)
Training certificate	0.988	(0.885-1.103)	0.952	(0.842-1.076)
High school diploma	0.730***	(0.665-0.802)	0.929	(0.838-1.029)
Associate's degree	0.897	(0.683-1.178)	1.168	(0.867-1.575)
Bachelor's degree	0.289***	(0.180-0.463)	0.474**	(0.292-0.772)
Family Level Independent Variables:				
Mother's age at first birth (years)	0.944***	(0.933-0.954)	0.984**	(0.974-0.994)
Mothers Educational Attainment:				
Less than high school	1.349***	(1.235-1.474)	1.114*	(1.006-1.233)
Some college	0.833***	(0.749-0.926)	0.960	(0.860-1.071)
College graduate	0.424***	(0.357-0.504)	0.704***	(0.594-0.835)
Unknown	1.247***	(1.094-1.423)	1.134	(0.974-1.321)
High school (reference)				
Family Structure at age 6	0.551***	(0.503-0.604)	0.785***	(0.715-0.863)
Currently cohabiting	2.416***	(2.176-2.683)	2.080***	(1.873-2.309)
Currently married	2.212***	(1.935-2.530)	2.301***	(1.987-2.665)
Currently receiving TANF	1.413***	(1.185-1.686)	1.285**	(1.062-1.554)
Currently participating in WIC	1.395***	(1.234-1.578)	1.163*	(1.030-1.312)
Sociocultural Variables:				
Catholic	0.918	(0.842-1.001)	0.908	(0.817-1.009)
No religion	1.109	(0.994-1.238)	0.987	(0.873-1.115)

Standard errors are adjusted for multiple observations from the same individuals. 95% confidence intervals are reported in parentheses. *$p < .05$; ** $p < .01$; *** $p < .001$; †In the univariate models, I ran separate models for each independent variable or group of variables (e.g. race); however, in each case all of the measures of time and episode were also included. In the multivariate model all of the variables are included in the model.

Table 6.3. Odds Ratios for the Likelihood of Pregnancy: Trimmed Covariates Model.

Variables	Odds Ratio	95% Confidence Interval
Measures of Time and Episode:		
Calendar month	1.005***	(1.003-1.007)
Age in months in January 1997	1.012***	(1.009-1.014)
Months at risk for a pregnancy	0.994***	(0.993-0.996)
Previous births	0.671***	(0.607-0.742)
Previous abortions	1.172***	(1.093-1.256)
Previous miscarriages	1.239***	(1.171-1.310)
Person Level Variables:		
Race:		
Black	1.234***	(1.119-1.362)
Hispanic	1.124*	(1.014-1.246)
ASVAB percentile score	0.991***	(0.989-0.993)
Age 1st sex (years)	0.880***	(0.862-0.897)
Currently employed	1.145**	(1.053-1.244)
Currently enrolled in school	0.583***	(0.524-0.649)
Completed a Bachelor's degree	0.482**	(0.297-0.782)
Family Level Independent Variables:		
Mother's age at first birth (years)	0.983***	(0.973-0.994)
Mothers Educational Attainment:		
Less than high school	1.105*	(1.010-1.210)
College graduate	0.707***	(0.601-0.832)
Family Structure at age 6	0.774***	(0.705-0.850)
Currently cohabiting	2.088***	(1.880-2.318)
Currently married	2.325***	(2.011-2.689)
Currently receiving TANF	1.294**	(1.069-1.565)
Currently participating in WIC	1.164*	(1.031-1.314)

Standard errors are adjusted for multiple observations from the same individuals.
95% confidence intervals are reported in parentheses.
*$p < .05$; ** $p < .01$; *** $p < .001$;

Table 6.4. Odds Ratios for the Likelihood of Pregnancy: Individual State Policy Variables.

Variables	Model Set 1: Controlling for Time and Episode[†]		Model Set 2: Model Set 1 + Independent Variables from the Trimmed Covariates Model[†]		Model Set 3: Model Sets 1 & 2 + State Fixed Effects[†]	
Univariate Estimates for Individual Policies						
State Welfare Policies						
Family Cap	0.999	(0.929-1.074)	0.931	(0.863-1.005)	1.328*	(1.065-1.656)
Eligibility of Pregnant Women	1.072	(0.998-1.153)	1.014	(0.937-1.097)	0.926	(0.548-1.565)
Maximum Benefit Amount	1.013**	(1.006-1.019)	1.005	(0.998-1.012)	1.028	(0.994-1.064)
State Abortion Policies						
Public Funding	1.072	(0.995-1.155)	1.057	(0.973-1.148)	0.856	(0.711-1.030)
Parental Involvement	1.128**	(1.049-1.213)	1.179***	(1.088-1.277)	1.100	(0.922-1.313)
Informed Consent	0.963	(0.895-1.035)	0.999	(0.926-1.078)	0.753**	(0.627-0.903)
Waiting Periods	1.024	(0.944-1.112)	1.063	(0.975-1.159)	0.894	(0.761-1.049)
Estimates for All Policies Together[††]						
State Welfare Policies						
Family Cap			0.956	(0.881-1.038)	1.298*	(1.041-1.617)
Eligibility of Pregnant Women			0.912	(0.820-1.015)	0.783	(0.443-1.383)
Maximum Benefit Amount			1.007	(0.996-1.018)	1.030	(0.994-1.067)
State Abortion Policies						
Public Funding			0.933	(0.834-1.044)	0.894	(0.739-1.083)
Parental Involvement			1.240***	(1.116-1.377)	1.111	(0.926-1.333)
Informed Consent			0.968	(0.865-1.084)	0.746*	(0.593-0.938)
Waiting Periods			0.992	(0.871-1.130)	1.055	(0.861-1.292)

Standard errors are adjusted for multiple observations from the same individuals. 95% confidence intervals are reported in parentheses.
*$p < .05$; ** $p < .01$; *** $p < .001$
[†]In the first set of models, I ran separate models for each policy variable or set of policy variables, controlling only for measures of time and episode. In the second set of models, I ran separate models for each policy variable or set of policy variables, controlling for measures of time and episode, and all of the covariates included in the trimmed model. The third set of models is the same as model set two, but state fixed effects variables have been added as controls.
[††] Please see footnote 1 in this chapter.

Table 6.5. Odds Ratios for the Likelihood of Pregnancy: Tests of Specific Policy Hypotheses.

Variables	Model Set 1: Controlling for Time and Episode†		Model Set 2: Model Set 1 + Independent Variables from the Trimmed Covariates Model		Model Set 3: Model Sets 1 & 2 + State Fixed Effects	
Does the effect of a family cap policy matter more for women that already have at least one child?						
Family Cap	1.063	(0.977-1.156)	0.880	(0.901-1.079)	1.384**	(1.105-1.734)
Previous Birth	1.027	(0.947-1.114)	0.713***	(0.640-0.795)	0.687***	(0.615-0.767)
Family Cap X Previous Birth	0.870**	(0.795-0.953)	0.986*	(0.792-0.978)	0.905	(0.812-1.007)
Does the effect of restrictions on public funding of abortion matter more for women on welfare than for other women?						
Public Funding	1.111*	(1.019-1.212)	1.060	(0.966-1.163)	0.863	(0.714-1.044)
Currently participating in WIC	1.561***	(1.321-1.844)	1.174	(0.989-1.394)	1.194*	(1.006-1.415)
Public Funding X Currently participating in WIC	0.841	(0.703-1.006)	0.988	(0.824-1.184)	0.960	(0.800-1.152)
Does the effect of a parental involvement law matter more for minors than for older women?						
Parental Involvement	1.113**	(1.029-1.204)	1.182***	(1.080-1.294)	1.074	(0.888-1.297)
Respondent a Minor	0.524***	(0.447-0.614)	0.720***	(0.612-0.847)	0.713***	(0.605-0.842)
Parental Involvement X Respondent a Minor	1.032	(0.880-1.210)	0.983	(0.837-1.154)	1.013	(0.858-1.197)

Standard errors are adjusted for multiple observations from the same individuals. 95% confidence intervals are reported in parentheses.
*$p < .05$; ** $p < .01$; *** $p < .001$
†In the first set of models, I ran separate models for each set of policy variables, controlling only for measures of time and episode. In the second set of models, I ran separate models for each set of policy variables, controlling for measures of time and episode, and all of the covariates included in the trimmed model. The third set of models is the same as model set two, but state fixed effects variables have been added as controls.

Table 6.6. Odds Ratios for the Likelihood of Pregnancy: Individual State Policy Summary Scores.

Individual Policy Typologies:	Model Set 1: Controlling for Time and Episode†		Model Set 2: Model Set 1 + Independent Variables from the Trimmed Covariates Model		Model Set 3: Model Sets 1 & 2 + State Fixed Effects	
Stringent Welfare State	1.117**	(1.037-1.203)	1.013	(0.937-1.096)	1.667**	(1.232-2.256)
Number of Welfare Policies	1.032	(0.999-1.067)	0.987	(0.953-1.022)	1.183*	(1.026-1.364)
Stringent Abortion State	1.082*	(1.007-1.163)	1.132**	(1.045-1.226)	0.942	(0.771-1.150)
Number of Abortion Policies	1.020	(0.995-1.046)	1.033*	(1.004-1.062)	0.918*	(0.851-0.991)

Standard errors are adjusted for multiple observations from the same individuals. 95% confidence intervals are reported in parentheses. *$p < .05$; ** $p < .01$; *** $p < .001$

†In the first set of models, I ran separate models for each policy variable or set of policy variables, controlling only for measures of time and episode. In the second set of models, I ran separate models for each policy variable or set of policy variables, controlling for measures of time and episode, and all of the covariates included in the trimmed model. The third set of models is the same as model set two, but state fixed effects variables have been added as controls.

Table 6.7. Odds Ratios for the Likelihood of Pregnancy: State Policy Typologies.

Variables	Model Set 1: Controlling for Time and Episode†		Model Set 2: Model Set 1 + Independent Variables from the Trimmed Covariates Model		Model Set 3: Model Sets 1 & 2 + State Fixed Effects	
<u>Welfare & Abortion Policy Interactions:</u>						
Stringent Welfare State	1.204**	(1.079-1.344)	1.112	(0.993-1.246)	1.752***	(1.278-2.403)
Stringent Abortion State	1.150*	(1.029-1.285)	1.275***	(1.135-1.432)	1.221	(0.803-1.858)
Stringent Welfare State X Stringent Abortion State	0.850*	(0.732-0.988)	0.803**	(0.687-0.939)	0.720	(0.460-1.127)
<u>Welfare & Abortion Policy Interactions (Alternate Coding):</u>						
Stringent Welfare/Stringent Abortion	1.177**	(1.071-1.294)	1.139*	(1.026-1.265)	1.541*	(1.085-2.189)
Stringent Welfare/Lenient Abortion	1.204**	(1.079-1.344)	1.112	(0.993-1.246)	1.752***	(1.278-2.403)
Lenient Welfare/Stringent Abortion	1.150*	(1.029-1.285)	1.275***	(1.135-1.432)	1.221	(0.803-1.858)
Lenient Welfare/Lenient Abortion (ref.)						

Standard errors are adjusted for multiple observations from the same individuals. 95% confidence intervals are reported in parentheses. *$p < .05$; ** $p < .01$; *** $p < .001$

†In the first set of models, I ran separate models for each policy variable or set of policy variables, controlling only for measures of time and episode. In the second set of models, I ran separate models for each policy variable or set of policy variables, controlling for measures of time and episode, and all of the covariates included in the trimmed model. The third set of models is the same as model set two, but state fixed effects variables have been added as controls.

Table 6.8. Results of Hypotheses on the Effects of State Welfare and Abortion Policies on the Likelihood of Pregnancy

Hypothesis:	Result:
H1: Individual, family, and sociocultural factors are related to the likelihood of pregnancy among young women.	Confirmed
H2: After controlling for the effects of other factors, state family formation related welfare policies and abortion policies are related to the likelihood of pregnancy among young women.	Mixed
H2a: Stringent state family formation related welfare policies will decrease the likelihood of pregnancy among young women.	Opposite
H2a1: Young women residing in states with a family cap policy will have lower odds of pregnancy.	Opposite
H2a1a: The effects of a family cap policy will be stronger for women who already have a child than for women with no children.	No evidence
H2a2: Young women residing in states where a current pregnancy is not counted towards welfare eligibility will have lower odds of pregnancy than young women residing in states without this policy.	No evidence
H2a3: Young women residing in states with a relatively low maximum cash benefit amount will have lower odds of pregnancy than young women residing in states with a relatively high maximum cash benefit amount.	Inconclusive
H2a4: Young women residing in stringent welfare states will have lower odds of pregnancy than young women residing in lenient welfare states.	Opposite
H2a5: Young women residing in states with multiple stringent family-formation related welfare policies will have lower odds of pregnancy than young women residing in states with few or no stringent welfare policies.	Opposite
H2b: Stringent state abortion policies will decrease the likelihood of pregnancy among young women.	Mixed
H2b1: Young women residing in states where public funds may not be used to pay for abortion will have lower odds of pregnancy than young women residing in states where public funds are available for abortion.	No evidence
H2b1a: The effects of public funding of abortion will be stronger for women on welfare than for other women.	No evidence
H2b2: Young women residing in states with a parental involvement law will have lower odds of pregnancy than young women residing in states without a parental involvement law.	Inconclusive
H2b2a: The effects of parental involvement laws will be stronger for minors than for older women.	No evidence
H2b3: Young women residing in states with a mandatory waiting period before abortion will have lower odds of pregnancy than young women residing in states without a mandatory waiting period.	No evidence
H2b4: Young women residing in states with mandatory informed consent procedures will have lower odds of pregnancy than young women residing in states without mandatory informed consent procedures.	Mixed
H2b5: Young women residing in stringent abortion states will have lower odds of pregnancy than young women residing in lenient abortion states. .	Opposite
H2b6: Young women residing in states with multiple stringent abortion policies will have lower odds of pregnancy than young women residing in states with few or no stringent abortion policies.	Mixed
H2c: The overall effects of state welfare and abortion policy stringency on young women's likelihood of pregnancy will be additive.	No evidence
H2c1: Pregnancy will be the most likely among women residing in states with lenient welfare and lenient abortion policies.	Opposite
H2c2: Pregnancy will be the least likely among women residing in states with stringent welfare and stringent abortion policies.	Opposite

CHAPTER SEVEN: Predictors of Pregnancy Resolution

In the previous chapter, rational choice theory (Becker, 1991) and Bronfenbrenner's (1979) ecological model of human development were used as a framework to examine the decision to get pregnant. This chapter uses a similar framework and set of variables to examine the factors that influence how a pregnancy is resolved, either through live birth or induced abortion. More specifically, this chapter aims to answer the following question: after controlling for other individual and background influences, do state family formation related welfare policies and state abortion policies affect the likelihood of abortion among a sample of pregnant young women? The following provides a brief review of the research questions and hypotheses, outlines the research design and method of statistical analysis, reports and interprets the research findings, and discusses the validity and significance of the study.

Research Question and Hypotheses

Similar to the predictors of pregnancy, the predictors of pregnancy resolution can be grouped into four levels: individual, family, sociocultural, and social structural (Franklin, 1988; Murray, 1995). The key focus of this analysis is the impact of social structural factors—specifically state family formation related welfare policies and state abortion policies—on the likelihood of choosing an induced abortion over a live birth. In this situation, a pregnancy can be resolved in one of three ways. The first is an unplanned end to the pregnancy as a result of spontaneous abortion, miscarriage or stillbirth. For the purposes of this analysis, I assume that a miscarriage is a non-intentional and random event. Therefore, a woman who does not experience an unplanned end to her pregnancy is faced with two options. She can either abort

her fetus, or carry the child to term. Economic theory suggests that policies which lower the potential cost of giving birth will increase the likelihood of a live birth; whereas policies which raise the cost of a live birth will tend to decrease the likelihood of a live birth. On the other hand, policies which lower the cost of abortion will increase the likelihood of abortion; whereas policies which raise the cost of an abortion will tend to decrease the likelihood of an abortion.

In this sense, stringent welfare and stringent abortion policies may be working at cross purposes. Stringent welfare policy would raise the costs of a live birth, and thereby make it more likely that a woman would choose an abortion over a live birth. However, stringent abortion policy would raise the costs of abortion, and therefore make it more likely that a woman would choose a live birth over an abortion. Based on the findings of previous research and economic theories of rational choice, I hypothesize the following relationships:

H1: Individual, family, and sociocultural factors are related to the likelihood of abortion among pregnant young women.

H2: After controlling for the effects of other factors, state family formation related welfare policies and abortion policies are related to the likelihood of abortion among pregnant young women.

H2a: Stringent state family formation related welfare policies will increase the likelihood of abortion among pregnant young women.

H2a1: Pregnant young women residing in states with a family cap policy will have higher odds of abortion.

H2a1a: The effects of a family cap policy will be stronger for women who already have a child than for women with no children.

H2a2: Pregnant young women residing in states where a current pregnancy is not counted towards welfare eligibility will have higher odds of abortion than pregnant young women residing in states without this policy.

H2a3: Pregnant young women residing in states with a relatively low maximum cash benefit amount will have higher odds of abortion than pregnant young women residing in states with a relatively high maximum cash benefit amount.

H2a4: Pregnant young women residing in stringent welfare states will have higher odds of abortion than pregnant young women residing in lenient welfare states.

H2a5: Pregnant young women residing in states with multiple stringent family-formation related welfare policies will have higher odds of abortion than pregnant young women residing in states with few or no stringent welfare policies.

H2b: Stringent state abortion policies will decrease the likelihood of abortion among pregnant young women.

H2b1: Pregnant young women residing in states where public funds may not be used to pay for abortion will have lower odds of abortion than pregnant young women residing in states where public funds are available for abortion.

H2b1a: The effects of public funding of abortion will be stronger for women on welfare than for other women.

H2b2: Pregnant young women residing in states with a parental involvement law will have lower odds of abortion than pregnant young women residing in states without a parental involvement law.

H2b2a: The effects of parental involvement laws will be stronger for minors than for older women.

H2b3: Pregnant young women residing in states with a mandatory waiting period before abortion will have lower odds of abortion than pregnant young women residing in states without a mandatory waiting period.

H2b4: Pregnant young women residing in states with mandatory informed consent procedures will have lower odds of abortion than pregnant young women residing in states without mandatory informed consent procedures.

H2b5: Pregnant young women residing in stringent abortion states will have lower odds of abortion than pregnant young women residing in lenient abortion states.

H2b6: Pregnant young women residing in states with multiple stringent abortion policies will have lower odds of abortion than pregnant young women residing in states with few or no stringent abortion policies.

H2c: The overall effects of state welfare and abortion policy stringency on pregnant young women's odds of abortion will be additive.

H2c1: Abortion will be the most likely among pregnant women residing in states with stringent welfare and lenient abortion policies.

H2c2: Abortion will be the least likely among pregnant women residing in states with lenient welfare and stringent abortion policies.

Analysis Strategy

Based on the above hypotheses, the analysis will consists of two parts. The first part will identify a set of significant individual, family, and sociocultural variables associated with the likelihood of abortion among pregnant women. The second part will estimate the effects of state policies on the likelihood of abortion, after accounting for the set background and contextual variables. Data for the analysis come from the pregnancy histories of young women from the National Longitudinal Survey of Youth 1997 cohort. This analysis focuses on the 3,181 pregnancies among these women which occurred between January 1997 and December 2004, and have a known outcome. The following provides only a limited description of the variables involved in the analyses, as a complete description of the data and variable coding can be found in Chapter Five.

Person level independent variables include measures of age, race, intelligence, education, age at menarche and first sexual experience, as well as measures of employment, school enrollment, educational attainment, and prior fecundity. Family level independent variables include mother's age at first birth and educational attainment, childhood family structure, current marital and cohabitation status, as well as the receipt of public assistance. The sociocultural independent variables include religious affiliation. Lastly, the social structural independent variables include measures of state welfare and abortion policy stringency. In some models, state fixed effects dummy codes are also included in order to account for unmeasured state level heterogeneity in social structural variables (Snijders & Bosker, 1999).

For each of the hypotheses outlined above, the key outcome of interest is the likelihood of abortion verses a live birth. However, as mentioned earlier, abortion and live birth are not the only ways that a pregnancy may end. It is estimated that 10-25% of known pregnancies end in a

miscarriage during the first 20 weeks of gestation (Kallen, 1988). Moreover, of pregnancies that survive past 20 weeks, around seven percent will end in either fetal death or a stillbirth (National Center for Health Statistics, 2007). For the purposes of this analysis, it is assumed that a miscarriage or a stillbirth is a random, unintentional event, and that women who experienced a miscarriage or stillbirth would have a carried the pregnancy to term if it had not ended spontaneously. Though it is likely that some women who experienced an early term miscarriage may have later elected to abort the pregnancy had it survived, it is difficult to determine with a high level of accuracy which women would have done this based on the available data. Moreover, it is also possible that some women may have reported an induced abortion as a miscarriage and vice versa, but again there is no way to determine from the available data which women may have done this. Therefore, in order to measure the extent of bias among the reporting of miscarriages, in all of the statistical models, I also estimate the likelihood of experiencing a miscarriage or stillbirth as opposed to a live birth. Though the likelihood of a miscarriage may be related to some individual level factors, such as previous miscarriages and age, I do not anticipate that the state policy variables will impact the likelihood of a stillbirth or miscarriage.

One method for estimating the likelihood of an abortion over a live birth and the likelihood of a miscarriage over a live birth is to use multinomial logistic regression. Assuming that a pregnancy can be resolved in one of three ways (1= live birth; 2= abortion; and, 3= miscarriage or stillbirth), the general model for this analysis is as follows (Long, 1997):

$$\text{Probability (pregnancy resolution} = m \mid x_i) = \frac{\exp(\alpha + \beta_m x_i)}{1 + \sum_{j=2}^{J} \exp(\alpha + \beta_j x_i)} \qquad \text{for } m > 1$$

In this model, the probability that a woman's pregnancy is resolved in either an abortion or a stillbirth/miscarriage is a function of her values on a series of predictor variables, x_i. In this

analysis, all of the predictor variables are measured in the same month in which a respondent gets pregnant[1]. Multinomial logistic regression allows for the simultaneous estimation of the effects of the predictor variables on the likelihood of an abortion or a stillbirth/miscarriage relative to the likelihood of a live birth. Though the analysis examines 3,181 pregnancies, many women experienced more than one pregnancy, and therefore the sample consists of only 1,778 individual women. In order to account for the lack of independence among the observations, the final analyses were estimated using the multinomial logit function in STATA 9SE (StataCorp, 2005), and the standard errors were adjusted by clustering the observations within individuals by using the cluster command.

One advantage of using multinomial logistic regression is that with an exponential transformation, the estimated coefficients, $\beta_{j,}$ can be transformed into odds ratios in order to provide a more consistent and intuitive metric for comparing the relative effect sizes of each predictor variable (Long, 1997). However, though odds ratios present a useful comparative metric, they should be interpreted with caution in multinomial logistic regression. The women in the sample experienced 3,181 pregnancies between January 1997 and December 2004. This resulted in 2,213 live births, 585 stillbirths or miscarriages, and 473 abortions. By far, the most common outcome was live births, accounting for almost 70% of all pregnancies. Therefore, when examining the calculated odds ratios it is important to note that no subgroups were more likely to experience a miscarriage or an abortion than they were to experience a live birth. Odds ratios greater than one do not suggest that an abortion or a miscarriage was *absolutely* more

[1] Admittedly, the decision of how to resolve a pregnancy is not necessarily decided in the first month of pregnancy. For some women it may have been decided long before getting pregnant; whereas for other women, it may not be fully decided until late in the pregnancy. Moreover, for those who experience a miscarriage or stillbirth, it is most likely that this outcome was never chosen. However, the data do not allow me to determine the exact month in which a pregnancy resolution decision occurs. Therefore, given that some pregnancies are resolved during the first month of pregnancy, I decided to use the values of the predictor variables, including the state policies for the state of residence, from the month in which a pregnancy began.

likely than a live birth for a particular group, but instead the odds of abortion were *relatively* higher for this group. For example, the odds of abortion relative to live birth for the entire sample was 473:2,213. However, for one subgroup the odds may be 249:1,001. Though both groups have a probability of abortion of less than .2, the odds of abortion among the subgroup are 16% higher than the odds of abortion for the entire sample.

The analysis in Chapter Six used event history models to predictor the timing of pregnancy (the likelihood of pregnancy in a given month), and therefore the modeling of time was critical to the mathematical and statistical models. This analysis uses multinomial logistic regression models of discrete choice in order to examine the resolution of pregnancy. Mathematically, measures of time are not as critical to these models as the event history models. However, conceptually, it was still important to model the effects time on our sample. Because states tended to pass more stringent welfare and abortion legislation as time progressed from January 1997 to December 2004, it was necessary to control for this period effect by accounting for each passing calendar month. However, the respondent's age was also likely to affect how a pregnancy was resolved. For example, very young pregnant women are more likely to end a pregnancy in abortion than are women in their late teens or early twenties (Jones, Darroch, Henshaw, 2002; Joyce, 1988), and the sample became progressively older over this time period. The average age of the sample and the calendar month were highly correlated, however, and therefore both could not be included in the model. Similar to Chapter Six, I had to select measures of time that were relevant conceptually but that did not lead to a high degree of multicolinearity. After exploring several alternative methods of coding for the various time, age and episode measures, as well as the correlations between them, I decided to include the following in the final models:

1) The calendar month. This was a time varying variable designating the calendar month to which each individual person month pertained. This variable helps to account for period effects experienced by the entire sample, as well as the overall aging of the sample.
2) Age in months in January 1997. This was a fixed variable. Given the restrictions on the age of the sample, the older women would be expected to have lower rates of abortion or miscarriages and stillbirths than the younger women. This variable accounts for that effect.
3) The number of previous births, previous stillbirths and miscarriages, and previous abortions a woman had experienced. It is likely that the outcomes of previous pregnancies are likely to affect the outcomes of subsequent pregnancies. For example, a woman who wants a child but experiences a stillbirth will probably be more likely to choose a live birth over an abortion during the next pregnancy. These variables account for that effect.
4) The number of months at risk for a pregnancy. Given that all of the women in this analysis are pregnant, this variable represents a proxy for the spacing of pregnancies.[2] Previous research suggests that closely spaced pregnancies are more likely to be aborted or to result in a miscarriage (DaVanzo, Hale, Razzaque & Rahman, 2007). This variable accounts for that phenomenon.

Table 7.1 displays the correlations between these measures of time, age, and pregnancy spacing. None of the correlations are higher than .51, suggesting that multicolinearity among these measures does not pose a threat to the stability of later statistical analyses. A more detailed

[2] This is not a perfect measure of the spacing of pregnancies because for women with only a first pregnancy it is actually the time between the age of 12.5 years (the average age at menarche for the sample), and the time of the first pregnancy. In this case it is better understood as a measure of the length of time at risk for a pregnancy. However, the majority of pregnancies in the analyses are first pregnancies, and therefore it seemed logical to have some measure of the waiting time for both first pregnancies and subsequent pregnancies.

description of the creation and coding of these variables can be found in Chapter Five. Because these variables are conceptually important, they are included in all subsequent analyses.

Results

Time, Person Level, Family Level, and Sociocultural Level Predictors

Which personal, family, and sociocultural variables are associated with the resolution of pregnancy? Table 7.2 contains the results of the univariate relationships between the predictor variables and the likelihood of an abortion or a miscarriage/stillbirth relative to a live birth. In each case, I estimated the effects of a single predictor on the likelihood of pregnancy, after controlling for the age, time and spacing variables. The passage of time—or the general aging of the population—was not associated with a change in the odds of abortion or miscarriage/stillbirth relative to a live birth. Moreover, older pregnant women were no more likely to experience an abortion or a stillbirth/miscarriage than younger pregnant women. However, the spacing of pregnancies was associated with a change in the odds of having an abortion or a stillbirth/miscarriage relative to a live birth. For each month that a woman waited to get pregnant, her odds of an abortion or miscarriage declined by about 1%. Moreover, the outcomes of previous pregnancies were related to the outcome of a current pregnancy. Each previous live birth was associated with a 31% decrease in the odds of abortion and a 39% decrease in the odds of a stillbirth or miscarriage. Each previous abortion a woman had experienced more than doubled her odds of resolving a current pregnancy in abortion, but was not significantly related to her odds of experiencing a miscarriage. On the other hand, each previous miscarriage a woman had experienced increased her odds of miscarriage by 33%, but prior miscarriages were not significantly related to her odds of abortion.

For the personal level variables, Black and Hispanic pregnant women were significantly less likely to experience an abortion or miscarriage when compared with pregnant White women. Delays in age at menarche were not associated with a change in the likelihood of abortion or miscarriage, while each year a young woman waited to have sexual intercourse was associated with a 6% decrease in her odds of having an abortion. Moreover, higher scores on the ASVAB were associated with an increase in the odds of abortion or miscarriage relative to a live birth, as were girls who were currently enrolled in school. Employment at the time of conception was also associated with a 39% increase in the odds of abortion. The only educational attainment measure significantly related to pregnancy outcomes was the receipt of a high school diploma, which was associated with a 72% increase in the odds of abortion.

Moving to the family level variables, characteristics of the respondents' mothers were related to the risk of experiencing an abortion. Women whose mothers had waited until a later age to give birth were more likely to obtain an abortion than those whose mothers had given birth at an early age. Moreover, relative to women whose mothers had received only a high school diploma, the odds of abortion were 65% higher for respondents whose mothers had at least some college, and 2.3 times greater among women whose mothers had graduated from college. On the other hand, the odds of abortion among women whose mothers had not graduated from high school were 33% lower than the odds of abortion among women whose mothers had received a high school diploma.

Interestingly, women's family structure at age six was not associated with the likelihood of abortion, but their current family structure was. Pregnant women who were currently cohabiting were 57% less likely to obtain an abortion, whereas married pregnant women were 84% less likely to obtain an abortion when compared with single women. As expected, family

structure was not significantly associated with the odds of experiencing a miscarriage or stillbirth.

The results of the receipt of public assistance are difficult to interpret. Currently receiving TANF was associated with an increase in the likelihood of experiencing a miscarriage. Moreover, a similar though non-significant result was observed with regard to abortion. On the other hand, participating in WIC was significantly associated with a decrease in both the odds of experiencing an abortion and having a miscarriage. Why the two public assistance programs appear to work in opposite directions is unclear.

The only sociocultural variables included were whether or not a woman identified as Catholic and whether or not she reported no religious affiliation. Neither of these variables was significantly related to women's pregnancy outcomes.

Table 7.3 contains the results of the multivariate model, where all of the predictors were estimated simultaneously. Most of the relationships were similar to those found in the univariate models, with a few exceptions. In contrast to the univariate models, in the multivariate model previous births were not associated with a significant decrease in a woman's odds of abortion or miscarriage. Moreover, at the person level, age at first sex and current employment were no longer significantly related to the odds of abortion, while the percentile score on the ASVAB was no longer related to the odds of experiencing a miscarriage. At the family level, mother's age at first birth was no longer significantly related to the odds of abortion, and a few of the contrasts for mother's education were no longer significantly related to abortion. Also, in contrast to the univariate models, in the multivariate models, marriage was associated with a decrease in the odds of experiencing a miscarriage. Other than that, the estimates were typically in the same direction and magnitude as in the univariate analyses.

Having established which personal, family, and sociocultural variables were associated with a change in the odds of pregnancy, I wanted to create an optimal trimmed model for use in later tests of the effects of policy variables. I trimmed the full multivariate model through a series of stepwise deletions. I began by dropping the least significant variables and then comparing the change in the AIC. If the AIC changed little or improved, the non-significant variable was dropped. In no instances did the AIC grow as a result of non-significant variables that were dropped from the model (not shown). The variables were dropped in this order: 1) the racial category mixed/other was collapsed into the White category; 2) all of the individual measures of educational attainment were dropped sequentially, except of the receipt of a high school diploma; 3) the sociocultural measures of religious identification were dropped; 4) age at menarche and age at first sex were dropped; 5) mothers education was collapsed into two categories, some college/college graduate, and all others were in the reference category; 6) mothers age at first birth was dropped; and, 7)current employment was droppd.

Table 7.4 contains the estimates of the odds ratios for the likelihood of abortion versus a live birth and a miscarriage/stillbirth versus a live birth for the final trimmed covariates model. Examining the measures of time and episode, the odds of experiencing an abortion or miscarriage relative to a live birth did not increase as time passed or the sample aged. Moreover, older pregnant women were not significantly more likely to experience an abortion or miscarriage relative to a live birth than were younger pregnant women.[3] As expected, the spacing between pregnancies was associated with a decrease in the likelihood of experiencing an abortion or miscarriage relative to a live birth. For each month that an individual woman went

[3] Though a non-significant predictor of abortion or miscarriage, the calendar month was included in subsequent models in order to serve as a fixed effect control for time given that states tended to get more stringent on both their welfare and abortion policies over time. The age of the mother at the start of the survey was included in subsequent models in order to account for the fact that older women tended to on average have more pregnancy episodes.

without getting pregnant, her odds of experiencing an abortion or a miscarriage, relative to a live birth decreased by about one percent.

Not surprisingly, the outcomes of previous pregnancies were found to be associated with the outcomes of subsequent pregnancies. For each abortion a woman had obtained, her odds of a subsequent abortion increased by roughly 90%. Moreover, for each miscarriage or stillbirth a woman had experienced her odds of a subsequent miscarriage or stillbirth increased by roughly a third. On the other hand, previous live births were not significantly related to odds of a subsequent abortion, but they were associated with a decrease in the odds of experiencing a subsequent miscarriage.

As expected, several person level variables also had an effect on a woman's likelihood of experiencing an abortion or miscarriage. The odds of either an abortion or miscarriage were 30%-40% lower for Blacks and Hispanics than for woman from other racial groups. Moreover, higher achieving women faced greater odds of having an abortion. Each percentile increase in a woman's ASVAB score was associated with a 1.4% increase in the odds she would have an abortion. To put this in perspective, the odds of abortion for a woman who scored at the 90% percentile would be 56% greater than the odds of abortion for a woman who scored at the 50% percentile. In addition, the odds of abortion for women who had graduated from high school were about 50% higher than the odds of abortion for women that had not finished high school, and women who were currently enrolled in school faced roughly 48% higher odds of abortion than women who were not currently in school. School enrollment was also a significant risk factor for experiencing a miscarriage or still birth, but it is unclear why.

Family level factors were also associated in the expected directions with a woman's odds of getting pregnant in a given month. When compared with women whose mothers had never

attended college, the odds of abortion were roughly 70% higher for women whose mother's had finished at least some college or completed a college degree. When compared with single women, the odds of abortion were roughly 60% lower for cohabiting women and 87% lower for married women. Given that these women are in committed romantic relationships, a higher proportion of pregnancies among married and cohabiting couples are likely to be planned or wanted, and therefore less likely to be aborted.

Finally, participating in WIC was associated with a 47% decrease in a pregnant woman's odds of experiencing a miscarriage, while receiving TANF payments was associated with a significant increase in the odds of both abortion and miscarriage. As was discussed earlier, the results of the receipt of public assistance are difficult to interpret. Though policies such as the family cap may explain an increase in the rise of abortion among TANF participants, it is unclear why TANF participation would increase one's odds of miscarriage or stillbirth. Moreover, better nutrition and access to prenatal care among WIC participants may explain the observed decrease in the odds of a miscarriage or stillbirth, but does not explain the associated decrease in the odds of abortion. The interpretation is further complicated by the fact that most TANF recipients participate in WIC, but not all WIC participants received TANF, and yet the effects of these policies appear to offset one another. As discussed in Chapter Six, these variables may also be serving merely as markers for family income, a variable which was impossible to measure meaningfully in this data. However, if program participation is a marker for a general income effect one would expect that the effects of participation in either program would be similar, and yet the effects are offsetting. Because of this, estimates of the effects of program participation should be interpreted with caution.

Tests of Individual State Welfare and Abortion Policies

Having established which personal, family, and sociocultural variables were associated with the odds of abortion or miscarriage among pregnant women, the next task involved estimating the effects of state welfare and abortion policies on the likelihood of experiencing an abortion relative to a live birth. For all subsequent analyses, the focus was on the choice to have an abortion and it was assumed that state welfare and abortion policies would have no effect on the likelihoods that a woman would experience a spontaneous miscarriage or stillbirth, and therefore, only the results for abortion are reported.[4]

Similar to the analysis in Chapter Six, I began by estimating the effects for each individual state welfare and abortion policy separately, while controlling only for measures of time and episode. Next, I estimated the effects of all seven welfare and abortion policy variables together in order to control for any covariance among the effects of these policies. The results of this analysis can be found in Table 7.5 in the column for Model Set 1. Contrary to my expectations, residing in a state where a current pregnancy was not counted towards welfare eligibility and residing in a state with a low maximum welfare benefit relative to wages were both associated with a decrease in the odds a pregnant young woman would elect to have an abortion. On the other hand, three of the four abortion policies were associated with a decrease in the odds a pregnant woman would elect to have an abortion. Residing in a state with parental involvement laws, with waiting periods, or where the public funding of abortion was prohibited, was associated with a decrease in the odds a woman would elect to have an abortion. Family cap

[4] Though not reported here, with the exception of a very small effect for residing in a state with a low maximum welfare benefit (observed in only a few models), none of the policy variables were significantly correlated with the odds of experiencing a miscarriage over a live birth in any of the estimated models. As discussed in chapter 5, it is possible that respondents in the NLSY97 sample may have under reported the incidence of abortion, or reported an induced abortion as a miscarriage. If this was a common occurrence, it would bias the estimates of the predictors of electing to receive an abortion. However, it was impossible to determine which respondents had misreported or under reported abortions.

policies and informed consent laws were not significantly related to the likelihood of abortion. When the policy variables were estimated as a group, only the maximum benefit amount and parental involvement laws were significantly related to the odds of abortion over a live birth[5]. This would suggest that specific policies, such as the eligibility of pregnant women or the public funding of abortion, are not acting in isolation; but instead, the effects of specific policies either overlap or are interacting with the effects of other specific policies.

In the next set of models, I estimated the effects of each individual state welfare and abortion policy on the likelihood of abortion while controlling for time, episode, and the individual- and family-level variables in the trimmed covariates model in Table 7.4. These results are reported in Table 7.5 under the heading for Model Set 2. The results were nearly identical as those of Model Set 1. In this case, residing in a state where a current pregnancy was not counted towards welfare eligibility was related to a 41% decrease in the odds of abortion. Residing in a state where the public funding of abortion was prohibited was associated with a 51% decrease in the odds of abortion, while residing in a state with parental involvement laws was associated with 55% decrease in the odds a pregnant woman would obtain an abortion. Lastly, residing in a state with a mandated waiting period was associated with a 37% decrease in the odds a pregnant respondent would obtain an abortion. Family cap policies and informed consent procedures were not significantly related to the odds of abortion. When the policy variables were estimated as a group, only the maximum benefit amount and parental involvement

[5] I used the confidential NLSY97 geocode data from the BLS, which I was only licensed to use on certain computers at PRI. After leaving campus with the results, I could not find the estimates for models with all seven policy variables estimated simultaneously. I had originally planned to re-estimate these models; however, all of the coding I had stored on the PRI network was inadvertently deleted by the PRI staff. I could produce the proper coefficients, but it would take between 80 and 100 hours of additional coding on site at PRI. As a result, I have tried to provide the best estimates for these models from the results that I do have in hand. The results for the family cap are based on a model including only the family, the eligibility of pregnant women, and the maximum benefit amount. The results for the eligibility of pregnant women, the maximum benefit amount, public funding, and parental involvement are based on a model with only these four policy variables. The results for informed consent and waiting periods are based on a model with only the four abortion policies.

laws were significantly related to the odds of abortion over a live birth[6]. Once again, this would suggest that the effects of specific policies either overlap or are interacting with the effects of other specific policies.

In addition to variations in their welfare and abortion policies, states may also vary in other key characteristics that would influence how a pregnant woman would choose to resolve a pregnancy. Moreover, it is likely that many of these characteristics are not accounted for in these estimation models. Some of these variables may include state pregnancy and marriage rates or overall attitudes about non-marital pregnancy and abortion, variables which may also be associated with the likelihood that states pass specific welfare and abortion legislation (see Greafe et al., 2008). In order to account for these unmeasured state differences, the final set of models estimates the effects of individual state welfare and abortion policies while using state fixed effects variables to account for these unmeasured state level factors. The results of these estimations are reported in Table 7.5 under the heading for Model Set 3. When the fixed effects were added to the model, all but one of the policy variables were not significantly associated with the odds that pregnant women would elect to have an abortion. Moreover, though the estimated coefficient for the eligibility of pregnant women was significant, the effect size was very small. A similar result was observed when the effects of all seven policy variables was estimated simultaneously[7].

Though it may seem appropriate to add state fixed effects to these models in order to control unmeasured heterogeneity between the states, mathematically, it may not be suitable for these data dealing with abortion. In Chapter Six, when the fixed effects for the estimates of the likelihood of pregnancy were added, the standard errors for the estimates were only slightly

[6] See footnote 5.
[7] Unlike previous models, the coefficients for the all policies together after controlling for state fixed effects, represent a model where all seven policy variables were estimated simultaneously.

larger than they were before the fixed effects were included (See Table 6.4). However, for the models in Table 7.5, when the fixed effects were added, the standard errors were much larger.

One reason for this is that the analysis in Chapter Six included all eligible person months for each respondent. Moreover, pregnancy was a fairly common event (occurring roughly 3,200 times), and each individual that recorded a pregnancy typically also recorded many months without a pregnancy. Even with large variations in sample size across states, only six states recorded no pregnant person months, either because no one from the state was sampled, or no respondents in the state reported a pregnancy. The other 45 states and Washington D.C. recorded both pregnant and non-pregnant person months, and the range in the ratio of pregnant person months to non-pregnant person months for a given state was small. On the other hand, the analysis of abortion was restricted to only the 3,181 pregnancies between January 1997 and December 2004, of which roughly 70% resulted in a live birth. The NLSY97 sample was representative at the national level, but not necessarily representative for each state. As a result, some states had very few, if any, respondents who recorded a pregnancy. Moreover, for at least one state the pregnancy outcome was the same for all pregnancy events because only one pregnancy event occurred. Because of this, the state fixed effects dummy codes are likely to be primarily capturing differences in the abortion to birth ratios observed in this data, which do not exist in the real world, as opposed to controlling for unmeasured heterogeneity which does exist in the real world. Therefore, though adding fixed effects variables may seem like a logical estimation procedure to control for unmeasured heterogeneity, the nature of the NLSY97 sampling may make such state level variables inappropriate for this analysis, and therefore, the models that include the state fixed effects variables should be interpreted with considerable

caution (See Chapter Eight). A better method would have been to include a set of state level predictor variables in order to capture hypothesized state level differences.

If we focus on the models without the state fixed effects, in general, the effects of individual state abortion policies were consistent with my expectations. Three of the four abortion policies were associated with a reduction in the odds a pregnant woman would elect to have an abortion. On the other hand, the effects of individual state welfare policies were in the opposite direction of what I anticipated. In theory, stringent welfare policy should lead to an increase in abortion among pregnant women. However, residing in a state where pregnancy was not counted towards welfare eligibility or living in a state with low welfare benefits relative to wages was associated with a decrease in the odds of abortion among pregnant women.

Tests among Specific Subpopulations

Not all of the state welfare and abortion policies directly affect all members of the population. For example, parental involvement laws only apply to women under the age of 18. As discussed earlier, state welfare and abortion policies may have both a direct effect on young women's pregnancy resolution decisions, or they may simply be a marker for general sentiment about family formation and abortion within the state. To determine whether these policies are having a direct effect, one can compare the effects of these policies on the target population to the effects of these policies on the general population. Similar to Chapter Six, next I plan to test the effects of three policies targeted at specific populations: the family cap[8], public funding of abortion, and parental involvement laws.

[8] Admittedly, all three of the welfare policies are targeted at women who are at risk of someday participating in welfare programs, most likely those with lower incomes. However, the incomes of these women's households was measured on a yearly basis and given the monthly structure of the data and the assumed monthly variations in income given the ages of the women in the sample, it was impossible to construct a reliable measure of income for a given month. Moreover, though I had measures of their welfare participation in a given month, for most of these women, it was impossible to create a valid measure of their monthly risk of welfare participation. For this reason, the only welfare policy I have elected to examine is the family cap policy.

The family cap policy states that women who have additional children while on welfare will receive little or no increase in their monthly cash assistance amount. Therefore, it is expected that this policy is likely to have a greater effect on women who already have at least one child when compared to women with no children[9]. Similar to Chapter Six, I created an interaction term between the family cap variable and a variable that marked whether the respondent had previously given birth. As a result, this interaction term measures whether the effect of the family cap policy on the likelihood of abortion is different for mothers when compared to the effect of this policy on all pregnant women in the sample. The results of this analysis are displayed in Table 7.6. When only controlling for time and episode, having previously given birth was associated with a decrease in the odds of abortion among pregnant women. However, residing in a state with a family cap was not significantly related to the risk of abortion. Moreover, the effect of residing in a state with a family cap policy was not significantly different for mothers and non-mothers. A similar result was observed when I added controls for personal and family background characteristics. In essence, it appears that family cap policies are not related to the risk of abortion among pregnant women in general, or among women with children, the target population.

In previous models, I observed that parental involvement laws were related to the risk of abortion among the pregnant women in the sample. However, parental involvement laws only apply to women under age 18, so I wanted to examine whether the effects of this policy were different for women under age 18 relative to women age 18 or older. These results are found in the middle rows of Table 7.6. In general, residing in a state with a parental involvement law was

[9] I recognize that this is an imperfect comparison group. The ideal comparison group would be mothers with one or more children who are currently receiving TANF assistance, as opposed to all mothers with one or more children. However, so few women in the sample were receiving TANF in any given month that there were not enough cases to make this comparison. Therefore, it is likely that this analysis may also mask the true effects of family cap policies given that it is not comparing the true target group to the rest of the population.

associated with a significant decrease in the odds a pregnant woman would elect to have an abortion. However, minor respondents who were pregnant were equally as likely as older pregnant respondents to have an abortion. Therefore, though parental involvement laws appear to affect abortion rates, they are not having a differential effect on the populations targeted by these policies. Though parental involvement laws are associated with a decrease in the likelihood of abortion, it is difficult to conclude from this analyses that residing in a state with parental involvement laws directly leads to a decrease in abortion or merely represent a marker for the attitudes and behaviors of residents within these states.

Public funding of abortion was hypothesized to increase the likelihood that pregnant women would elect to end a pregnancy through abortion. However, this policy is likely to directly affect only women who may be eligible to receive this benefit. Therefore, in order to determine if this policy had a direct effect on the women's pregnancy resolution decisions I tested whether this policy had a different effect on women who were on some type of public assistance, relative to the effect of this policy on women who were not on public assistance (see Table 7.6). When only controlling for time and episode, we find that residing in a state where public funds may not be used to pay for abortion is associated with a significant decrease in the likelihood pregnant women will choose to have an abortion. Moreover, in general, women on some type of public assistance were also less likely to seek an abortion than those not currently on public assistance. As a result, one might expect that women on public assistance residing in states that do not allow public funds to be used for abortion would be the least likely to have an abortion. If we use the coefficients provided in the first column of Table 7.6, this does appear to be the case.

If we assume that the odds ratio for abortion over a live birth is 1.00 for women not on welfare and residing in states where public funds may be used for abortion, then we can calculate the relative odds for the following groups: 1) Not on welfare and residing in a state where public funds may not be used for abortion, .468; 2) On welfare and residing in a state where public funds may be used for abortion, .483; and, 3) On welfare and residing in a state where public funds may not be used for abortion, .409 (.468 x .483 x 1.805). In this example, women on welfare residing in states with a stringent policy regarding the public funding of abortion are the most likely to get an abortion. However, the effect of having both of these qualities appears to offset the main effects of these qualities, more than it does exacerbate them. In other words, receiving welfare or residing in a state that prohibits the public funding off abortion is associated with decreased odds of having an abortion. However, the effects of these qualities are not additive, and having both of these qualities only slightly increases the odds of abortion when compared to those with only one of these qualities. When the personal and family background characteristics are included the coefficients are similar in magnitude and direction. Taken together, these results suggest that restricting the public funding of abortion is associated with a reduction in the likelihood of abortion, though these policies are not necessarily having a direct effect on the target population. One explanation may be that these laws do not have a direct effect on behavior, but instead represent the larger cultural norms of the states where they are enacted. In other words, public funding laws were not passed with the intent of reducing the likelihood of abortion among women on welfare, but instead as a means of ensuring that taxpayers did not subsidize a behavior they did not wish to support.

The results of these three tests of specific policies suggest that specific state welfare and abortion policies are not having a direct on the specific pregnancy resolution decisions of the

populations hypothesized to be most affected by them. Perhaps this is because the policies do not operate in isolation, but are merely part of the overall stringency of state welfare and abortion policy.

Tests of State Welfare and Abortion Policy Stringency Typologies

In order to measure the effects of overall state welfare and abortion policy stringency, I estimated similar multinomial logistic regression models using state policy summary scores instead of the individual policy variables. For both the welfare and abortion policies, two separate summary scores were created (see Chapter Four). A respondent was coded as residing in a stringent welfare state if their state of residence had two or more stringent welfare policies in effect for that month. A respondent was coded as residing in a stringent abortion state if their state of residence had two or more stringent welfare policies in effect for that month. I also included a measure of the total number of stringent welfare policies in effect in a state during a given month (ranging from 0 to 3); as well as a measure of the total number of stringent abortion policies in effect in a state during a given month (ranging from 0 to 4). The effects for each of these variables were estimated in a separate set of models and the results are displayed in Table 7.7.

The results for welfare policies were the opposite of what I had hypothesized. Stringent welfare policies should raise the cost of childbearing, thereby increasing the odds of abortion. However, after controlling for only time and episode, residing in a stringent welfare state was associated with a 40% decrease in the odds a pregnant respondent would elect to have an abortion (see Table 7.7; Model Set 1). Moreover, each additional stringent welfare policy enacted within a respondent's state of residence was associated with a 20% decrease in the odds of abortion.

The results for abortion policies were consistent with my expectations. Making abortion more difficult to obtain should reduce the likelihood a pregnant woman chooses to have an abortion. Residing in a stringent abortion state was associated with a 45% decrease in the odds a pregnant respondent would have an abortion. In addition, each additional stringent abortion policy enacted within a respondent's state of residence was associated with a 20% decrease in the odds of abortion.

Similar results were observed after adding the person- and family-level covariates (see Table 7.7; Model Set 2), though the effects of state welfare policy were not quite as strong and the estimates for state abortion policy were slightly stronger. However, when I added the fixed effects to the model the results changed considerably (see Table 7.7; Model Set 3). Residing in a stringent abortion state was no longer associated with the odds of abortion. However, the odds of having an abortion were 3.9 times greater for women residing in a stringent welfare state than for women residing in a non-stringent welfare state. Though these results for welfare policy are consistent with my original hypotheses, it is difficult to interpret what the results of the fixed effects models mean, given the multicolinearity of the variables and the volatility of the standard errors. If we interpret only models 1 and 2, then it would suggest residing in a stringent welfare state or abortion state reduces the likelihood pregnant women will elect to have an abortion. However, it is still difficult to determine whether these policies are having a causal effect on women's pregnancy resolution decisions, or whether some third variable can explain both the policies enacted by a state and the pregnancy resolution decisions of women within that state.

Tests of State Welfare and Abortion Policy Stringency Interactions

I argued in Chapter Two that the effects of welfare and abortion policy stringency may be interactive. In other words, the effects of welfare policy on pregnancy resolution are likely to

interact with the effects of abortion policy on pregnancy resolution and vice versa. In order to test whether or not these policy effects are interactive, I estimated a series of multinomial logistic regression models using a similar pair of dummy codes to those I calculated in Chapter Six. In the first set of dummy codes, a respondent was coded one if they lived in a stringent welfare state for that month and zero otherwise. In a separate dummy code a respondent was coded one if they lived in a stringent abortion state for that month and zero otherwise. A third dummy code consisted of the interaction between these two terms, coded one if a respondent was living in a stringent welfare state and a stringent abortion state and zero otherwise. I also used an alternate coding which produced identical results, but allowed me to compare the effects of living in various state types without having to multiply to coefficients from the first set of dummy codes. In this coding scheme, a series of four mutually exclusive dummy codes were used to designate which of the four stringent welfare/stringent abortion policy combinations typified a respondent's state of residence in a particular month. For analysis purposes, residing in a lenient welfare and lenient abortion state was the reference category.

Similar to previous analyses, I began by controlling only for time and episode and then added the person and family level predictors, followed by the state fixed effects. The results of these estimation procedures are displayed in Table 7.8. When controlling for only time and episode, residing in a stringent welfare state or a stringent abortion state was associated with a decrease in the odds of resolving a pregnancy through abortion. Moreover, though the coefficient for the interaction term itself was non-significant, the effects of these policies tended to be additive, but not in the manner that I had predicted. I expected that abortion would be the most likely among women residing in states with stringent welfare policy, but lenient abortion policy. In fact, the odds of abortion were the greatest for women residing in states with lenient

welfare and lenient abortion policies. In addition, I had expected that women in states with lenient welfare and stringent abortion policies would have the lowest odds of choosing abortion; but instead, women residing in states that had both stringent welfare and stringent abortion policies had the lowest odds of choosing abortion.

When the state fixed effects were added to the model (see Table 7.8, Model Set 3) the results changed dramatically. In these models, residing in a stringent welfare state was associated with a strong increase in the odds of abortion. However, residing in a stringent abortion state was not associated with an increase in the odds of abortion. However, once again, it is difficult to interpret these effects given the nature of the sampling and the volatility of the standard errors.

Discussion

In this chapter I tested a series of related hypotheses. Table 7.9 contains a list of the hypothesis and the results of the statistical tests. I was able to confirm that individual, family, and sociocultural factors are related to the likelihood of abortion among young pregnant women. However, the tests of the effects of social structural factors—specifically state welfare and abortion policy stringency—were mixed.

In general, stringent family formation related welfare policies were associated with a significant decrease in the odds of abortion, exactly the opposite of my predictions. Moreover, the effects of the individual policies were either zero or in the opposite direction. I did somewhat better in predicting the effects of state abortion policy stringency, as residing in a state with stringent abortion policies was associated with a decrease in the odds the pregnant women in the

sample would have an abortion. Moreover, three of the four specific state abortion policies were associated with a decrease in the odds of abortion.

I found no evidence that the effects of state welfare and abortion policy stringency on the likelihood of abortion were counteractive or multiplicative. In fact, welfare and abortion policy stringency both appeared to have a similar main effect on the likelihood a woman would elect to resolve a pregnancy through abortion. In addition, I expected that young women residing in states that were stringent on welfare policy but lenient on abortion policy would be at the greatest risk of abortion, but instead they had the next to lowest risk. Moreover, I expected women from states strict on abortion but lenient on welfare to have the lowest likelihood of abortion, but instead they had the second highest.

The results for the abortion policies are consistent with my expectations, suggesting that making abortion more difficult to obtain reduces the likelihood that pregnant women will elect to have an abortion. However, it is also possible that states with low abortion rates due to cultural beliefs or other characteristics may have also passed more strict abortion policies. Therefore it is possible that a third variable may be driving this relationship. Though somewhat unstable for reasons discussed earlier, the results of the fixed effects models seem to bear this out. Once we control for other underlying unmeasured differences in the respondents' states of residence, specific abortion policies had little influence on a woman's odds of resolving a pregnancy through abortion.

The results for the welfare policies were the opposite of what I had theorized, suggesting that strict welfare policies were associated with a decrease in the odds of abortion. Though the fixed effects results were more consistent with my hypotheses, it is difficult to interpret these coefficients given the instability of the fixed effects models due to the nature of the sample, as

discussed earlier. As a result, the findings for the welfare policies are somewhat more difficult to explain, especially since these policies did not interact with the abortion policies in the expected manner. Three factors may partially explain the observed results among the welfare policies: a) it is possible that some specific policies were aimed at specific subgroups, and therefore measuring their effect on the entire population may obscure any real effect; b) it is possible that states with relatively low abortion rates were more willing to enact strict welfare policies, as they did not fear these policies would lead to a significant increase in their abortion rate; and c) stringent state family formation related welfare policies have little impact on the pregnancy resolution decisions of young women, or may even encourage pregnant women to keep their babies.

With regard to the first factor, I tested whether the family cap policy had a different effect on mothers versus women who had not previously given birth. However, the policy was not significantly related to the odds of abortion for either group of women, and did not appear to differentially affect mothers and non-mothers. It would have been preferable to test whether the family cap had a differential effect for mothers on welfare versus poor young women giving birth to their first child, but the sample size was not sufficient for this analysis. Further research, with a larger sample would be necessary to explore whether or not a real effect was masked in our data[10].

Another possible reason why residing in a state with stringent family formation related welfare policies was associated with a decrease in the odds of abortion is that states with relatively low abortion rates may have been more willing to pass policies that would lead to an increase in abortion than were states with relatively high abortion rates. Table 7.10 shows the

[10] The same could be said for the tests of the specific effects of abortion policies on different populations that I examined in Table 7.6, neither of which suggested that specific abortion policies were having a differential effect on the target population versus the population of all women. A larger sample may allow for a better test of these contrasts.

correlations between overall state abortion rates and state abortion ratios (taken from the National Center for Health Statistics) and measures of state welfare policy stringency. For these correlations, the state abortion rates and abortion ratios from one year were correlated with the state welfare policies in effect for the majority of the following year, for the policy years 1997-2004. In general, state welfare policy was not correlated with aggregate state abortion rates or ratios. The one exception was a small correlation (r = -.146), between the number of stringent welfare policies a state had adopted and the state abortion ratio. Taken together, these results suggest that states that had adopted stringent family formation related welfare policies did not have lower abortion rates than states that had not enacted stringent welfare policies, although stringent welfare states may have had slightly lower abortion ratios than the lenient welfare states. Though not a perfect test of the hypothesis, these data do not provide evidence that states with high levels of abortions avoided enacting stringent family formation related welfare policies.

An additional factor that may partially explain these results is the possibility that state welfare policies do not have a direct effect on the likelihood young pregnant women will resolve a pregnancy through abortion. I cannot completely rule out this explanation based on the evidence provided by these analyses, particularly since the results of the fixed effects models are exactly the opposite of the other models. It is also possible that stringent state welfare policies actually reduce a woman's odds of abortion. For example, if stringent welfare policies reduced the likelihood of pregnancy, then one might observe a reduction in the overall abortion rate. However, the results of Chapter Six suggest that, if anything, stringent welfare policies appeared to increase the odds of pregnancy for the women in this sample. Moreover, the analysis of abortion was limited only to pregnant women, thus any possible effects of welfare policy on

pregnancy, and thereby the overall likelihood of abortion, would not affect these estimates. It is unclear how stringent welfare policies making childbirth more expensive would lead to a reduction in the likelihood that pregnant women would choose abortion, and therefore, it is difficult to explain these results. Few would have predicted that stringent welfare policies would be associated with decreased odds of abortion, and in fact many groups, most notably the Catholic Church, opposed stringent welfare reform measures because they feared more women would choose abortion as a result of the legislation (Haskins, 2006).

When there is no theoretical explanation for a result that is the opposite of one's explanations, perhaps there are some serious threats to the internal validity of the research design. Perhaps a third variable predicts both the welfare policies that states enacted and the likelihood that pregnant women residing in those states will choose to resolve a pregnancy through abortion. When we control for other unmeasured heterogeneity between the states through the fixed effects, then the results are consistent with our hypotheses, and strict welfare policies are strongly correlated with an increase in the odds pregnant women will choose abortion. However, for reasons discussed earlier, it is difficult to determine exactly what the state fixed effects are measuring. Perhaps the greatest methodological limitation of this study is that it utilizes micro-level data to answer what is largely a macro-level question (Lee, 2001). Though this is a common methodology for addressing these types of questions, it is not always appropriate. State family formation related welfare policies and abortion policies are enacted at the state level with the intent of influencing state pregnancy rates. However, these data consist of individuals hypothesized to be making rational choices. Klerman (1998) argued that unless the sample size is sufficiently large (at least 50,000 by his estimates), this methodology will either fail to find any effects for state welfare policies on individual pregnancy resolution

decisions or will produce misleading results. This is because state level policies are best analyzed at the state level. A more precise method of measuring the effectiveness of state policies would be to look at changes in state level outcomes before and after the policies were implemented, as have New (2007) and others. Moreover, many of the welfare policies are likely to have an effect only on the poor, and if we limited the current sample to the poor, it would be even smaller.

Though this sample is representative of young women at the national level, it is not necessarily representative of the populations of young women within each individual state, or representative of the populations of young women in stringent or lenient states, as the sample was not stratified on these variables. Given that the sample was not completely random, and also that state policies are not completely random, this makes it very difficult to determine if these policies are leading to differences in the odds of abortion between women in stringent and lenient states, or if underlying differences in the populations living in stringent and lenient states are responsible for any observed differences in the likelihood of abortion. I tried to correct for this phenomenon by including controls for personal and family level variables, thus reducing the effects of differences in population composition. I also included state fixed effects in the models. This allowed me to account for any unmeasured differences in the subpopulations of women from one state to the next state, but this does little to correct for underlying sampling differences between the states. Moreover, for states with little change in policy, the state fixed effects would have essentially eliminated the policy effects for these states.

The methodological caveats aside, this analysis does provide some helpful information. For one, the results suggest that pregnant women residing in states with stringent abortion policies face a lower risk of abortion than pregnant women living in states with lenient abortion

policy. Moreover, at the individual level, despite the fears of many religious groups, there is some evidence to suggest that implementing stringent family formation related welfare policies did not lead to an increase in the likelihood that women would choose abortion. The results presented here also suggest that strict abortion policies are having their desired effect and decreasing the odds that pregnant women will elect to have an abortion. In addition, these results provide some evidence that state summary policy measures may be a better method of predicting individual pregnancy resolution decisions than looking at the effects of individual policies, though further research is needed in this field.

Table 7.1. Correlations between Measures of Time (N = 3,181).

	Previous births	Previous abortions	Previous miscarriages	Age in January 1997	Calendar month
Previous abortions	0.0406				
Previous miscarriages	0.0608	0.0188			
Age in months in January 1997	0.1651	0.1034	0.0456		
Calendar month	0.2758	0.1012	0.0599	-0.2181	
Months at risk for a pregnancy	-0.5062	-0.2699	-0.347	0.0484	0.129

Table 7.2. Univariate Odds Ratios for the Likelihood of Abortion vs. Live Birth and Miscarriage/ Stillbirth vs. Live Birth.

Variables	Abortion vs. Live Birth		Miscarriage/Stillbirth vs. Live Birth	
Measures of Time and Episode:				
Calendar month	1.001	(0.995-1.007)	1.002	(0.996-1.007)
Age in months in January 1997	1.004	(0.996-1.012)	1.000	(0.993-1.007)
Months at risk for a pregnancy	0.993*	(0.988-0.999)	0.991***	(0.986-0.996)
Previous births	0.689*	(0.512-0.925)	0.605***	(0.461-0.794)
Previous abortions	2.037***	(1.699-2.443)	0.947	(0.699-1.282)
Previous miscarriages	0.823	(0.602-1.125)	1.328***	(1.171-1.507)
Person Level Variables:				
Race:				
Black	0.715**	(0.561-0.911)	0.692**	(0.553-0.867)
Hispanic	0.532***	(0.392-0.721)	0.606***	(0.470-0.780)
Mixed race/Other	1.447	(0.905-2.313)	0.909	(0.539-1.532)
White (reference)				
ASVAB percentile score	1.020***	(1.015-1.025)	1.007**	(1.002-1.012)
Age at menarche (months)	1.001	(0.996-1.007)	0.998	(0.993-1.002)
Age 1st sex (years)	0.935*	(0.885-0.987)	0.962	(0.912-1.015)
Currently employed	1.390**	(1.096-1.762)	1.127	(0.913-1.391)
Currently enrolled in school	1.932***	(1.505-2.481)	1.380**	(1.104-1.725)
Academic Degrees Obtained:				
GED	0.854	(0.498-1.465)	1.027	(0.676-1.561
Training certificate	0.926	(0.631-1.360)	1.117	(0.808-1.543)
High school diploma	1.716***	(1.302-2.262)	0.982	(0.768-1.255)
Associate's degree	2.173	(0.791-5.966)	1.579	(0.594-4.195)
Bachelor's degree	3.441	(0.736-6.078)	2.949	(0.473-18.398)
Family Level Independent Variables:				
Mother's age at first birth (years)	1.044***	(1.020-1.069)	1.009	(0.988-1.031)
Mothers Educational Attainment:				
Less than high school	0.669**	(0.501-0.893)	0.921	(0.723-1.173)
Some college	1.665***	(1.260-2.201)	1.302	(0.997-1.699)
College graduate	2.312***	(1.556-3.435)	1.245	(0.829-1.869)
Unknown	0.596*	(0.379-0.936)	0.748	(0.513-1.089)
High school (reference)				
Family Structure at age 6	1.229	(0.946-1.598)	1.102	(0.874-1.390)
Currently cohabiting	0.428***	(0.325-0.562)	0.802	(0.633-1.016)
Currently married	0.159***	(0.090-0.281)	0.723	(0.497-1.053)
Currently receiving TANF	1.471	(0.903-2.395)	1.602*	(1.005-2.555)
Currently participating in WIC	0.685*	(0.491-0.956)	0.542***	(0.407-0.721)
Sociocultural Variables:				
Catholic	1.121	(0.875-1.437)	0.940	(0.743-1.188)
No religion	1.047	(0.765-1.432)	1.011	(0.756-1.350)

Standard errors are adjusted for multiple observations from the same individuals. 95% confidence intervals are reported in parentheses. *$p < .05$; ** $p < .01$; *** $p < .001$; In the univariate models, I ran separate models for each independent variable or group of variables (e.g. race); however, in each case all of the measures of time and episode were also included.

Table 7.3. Multivariate Odds Ratios for the Likelihood of Abortion vs. Live Birth and Miscarriage/Stillbirth vs. Live Birth.

Variables	Abortion vs. Live Birth		Miscarriage/Stillbirth vs. Live Birth	
Measures of Time and Episode:				
Calendar month	1.001	(0.993-1.009	1.005	(0.998-1.012)
Age in months in January 1997	1.004	(0.995-1.014)	1.003	(0.994-1.012)
Months at risk for a pregnancy	0.991**	(0.985-0.996)	0.988***	(0.984-0.993)
Previous births	1.035	(0.759-1.412)	0.762	(0.580-1.001)
Previous abortions	1.918***	(1.577-2.334)	0.852	(0.633-1.147)
Previous miscarriages	0.930	(0.689-1.255)	1.319***	(1.192-1.458)
Person Level Variables:				
Race:				
Black	0.670**	(0.498-0.901)	0.640**	(0.493-0.830)
Hispanic	0.627*	(0.436-0.901)	0.643**	(0.474-0.873)
Mixed race/Other	1.243	(0.778-1.985)	0.878	(0.522-1.477)
White (reference)				
ASVAB percentile score	1.013***	(1.008-1.019)	1.003	(0.998-1.009)
Age at menarche (months)	1.004	(0.998-1.009)	0.997	(0.992-1.002)
Age 1st sex (years)	0.942	(0.888-1.000)	0.981	(0.927-1.038
Currently employed	1.184	(0.917-1.530)	1.072	(0.859-1.338)
Currently enrolled in school	1.483**	(1.128-1.950)	1.298*	(1.026-1.642)
Academic Degrees Obtained:				
GED	1.080	(0.609-1.912)	0.935	(0.602-1.453)
Training certificate	0.938	(0.619-1.422)	1.170	(0.846-1.620)
High school diploma	1.483*	(1.089-2.019)	0.931	(0.710-1.222)
Associate's degree	1.618	(0.575-4.556)	1.205	(0.464-3.128)
Bachelor's degree	2.011	(0.515-7.854)	2.136	(0.298-15.294)
Family Level Independent Variables:				
Mother's age at first birth (years)	1.013	(0.986-1.040)	1.001	(0.978-1.024)
Mothers Educational Attainment:				
Less than high school	0.884	(0.657-1.189)	1.027	(0.798-1.322)
Some college	1.566**	(1.174-2.089)	1.199	(0.915-1.572)
College graduate	1.457	(0.948-2.240)	1.029	(0.670-1.580)
Unknown	0.804	(0.466-1.388)	0.817	(0.542-1.232)
High school (reference)				
Family Structure at age 6	1.020	(0.776-1.342)	1.035	(0.802-1.335)
Currently cohabiting	0.408***	(0.303-0.551)	0.816	(0.634-1.049)
Currently married	0.143***	(0.079-0.258)	0.656*	(0.445-0.967)
Currently receiving TANF	1.869*	(1.092-3.197)	2.232**	(1.378-3.614)
Currently participating in WIC	0.797	(0.546-1.162)	0.533***	(0.392-0.726)
Sociocultural Variables:				
Catholic	1.320	(0.965-1.807)	1.020	(0.771-1.350)
No religion	1.035	(0.750-1.429)	0.948	(0.709-1.268)

Standard errors are adjusted for multiple observations from the same individuals.
95% confidence intervals are reported in parentheses.
*$p < .05$; ** $p < .01$; *** $p < .001$

Table 7.4. Odds Ratios for the Likelihood of Abortion vs. Live Birth and Miscarriage/Stillbirth vs. Live Birth: Trimmed Covariates Model.

Variables	Abortion vs. Live Birth		Miscarriage/Stillbirth vs. Live Birth	
Measures of Time and Episode:				
Calendar month	1.002	(0.995-1.010)	1.005	(0.999-1.012)
Age in months in January 1997	1.006	(0.997-1.015)	1.003	(0.994-1.011)
Months at risk for a pregnancy	0.990***	(0.985-0.995)	0.989***	(0.984-0.993)
Previous births	1.028	(0.757-1.396)	0.766*	(0.588-0.999)
Previous abortions	1.899***	(1.558-2.313)	0.868	(0.648-1.163)
Previous miscarriages	0.915	(0.674-1.241)	1.334***	(1.209-1.471)
Person Level Variables:				
Race:				
Black	0.598***	(0.456-0.786)	0.655**	(0.515-0.833)
Hispanic	0.643**	(0.469-0.882)	0.661**	(0.511-0.855)
ASVAB percentile score	1.014***	(1.009-1.020)	1.004	(0.999-1.009)
Currently enrolled in school	1.476**	(1.130-1.927)	1.299*	(1.030-1.639)
Obtained high school diploma:	1.505**	(1.109-2.042)	0.965	(0.744-1.251)
Family Level Independent Variables:				
Mother has some college/college grad	1.690***	(1.330-2.148)	1.174	(0.939-1.469)
Currently cohabiting	0.412***	(0.306-0.556)	0.810	(0.633-1.037)
Currently married	0.133***	(0.074-0.239)	0.660*	(0.447-0.975)
Currently receiving TANF	1.861*	(1.095-3.164)	2.191**	(1.351-3.552)
Currently participating in WIC	0.774	(0.530-1.130)	0.529***	(0.389-0.717)

Standard errors are adjusted for multiple observations from the same individuals.
95% confidence intervals are reported in parentheses.
*$p < .05$; ** $p < .01$; *** $p < .001$

Table 7.5. Odds Ratios for the Likelihood of Abortion vs. Live birth: Individual State Policy Variables.

Variables	Model Set 1: Controlling for Time and Episode†		Model Set 2: Model Set 1 + Independent Variables from the Trimmed Covariates Model		Model Set 3: Model Sets 1 & 2 + State Fixed Effects	
Estimates for Individual Policies						
State Welfare Policies						
Family Cap	1.007	(0.813-1.246)	1.139	(0.913-1.419)	1.940	(0.709-5.307)
Eligibility of Pregnant Women	0.579***	(0.460-0.729)	0.593***	(0.468-0.751)	0.000***	(0.000-0.000)
Maximum Benefit Amount	0.950***	(0.934-0.967)	0.953***	(0.935-0.971)	1.027	(0.909-1.161)
State Abortion Policies						
Public Funding	0.527***	(0.423-0.656)	0.490***	(0.390-0.616)	1.504	(0.711-3.183)
Parental Involvement	0.528***	(0.425-0.656)	0.450***	(0.356-0.568)	0.649	(0.338-1.244)
Informed Consent	0.916	(0.744-1.129)	0.916	(0.736-1.141)	0.981	(0.464-2.074)
Waiting Periods	0.694**	(0.535-0.901)	0.625**	(0.476-0.821)	1.564	(0.724-3.382)
Estimates for All Policies Together						
State Welfare Policies						
Family Cap††	1.061	(0.858-1.313)	1.224	(0.978-1.531)	1.866	(0.679-5.126)
Eligibility of Pregnant Women†††	0.913	(0.661-1.261)	0.931	(0.674-1.286)	0.194	(0.013-2.976)
Maximum Benefit Amount†††	0.974*	(0.947-1.000)	0.979	(0.952-1.008)	1.025	(0.905-1.161)
State Abortion Policies						
Public Funding†††	0.791	(0.586-1.067)	0.750	(0.555-1.012)	1.431	(0.674-3.042)
Parental Involvement†††	0.694**	(0.530-0.909)	0.575***	(0.430-0.769)	0.691	(0.356-1.341)
Informed Consent††††	0.903	(0.690-1.180)	1.077	(0.811-1.431)	0.696	(0.286-1.692)
Waiting Periods††††	1.246	(0.846-1.835)	1.012	(0.684-1.499)	1.752	(0.718-4.270)

Standard errors are adjusted for multiple observations from the same individuals. 95% confidence intervals are reported in parentheses.

*$p < .05$; ** $p < .01$; *** $p < .001$

†In the first set of models, I ran separate models for each policy variable or set of policy variables, controlling only for measures of time and episode. In the second set of models, I ran separate models for each policy variable or set of policy variables, controlling for measures of time and episode, and all of the covariates included in the trimmed model. The third set of models is the same as model set two, but state fixed effects variables have been added as controls.

†† For Model Sets 1 and 2, this row of coefficients represent a model including only the family cap, eligibility of pregnant women, and the maximum benefit amount. For Model Set 3, all seven policy variables are included simultaneously.

††† For Model Set 1 and Model Set 2, these rows of coefficients represent a model which included only the eligibility of pregnant women, and the maximum benefit amount, public funding and parental involvement. For Model Set 3, all seven policy variables are included simultaneously.

†††† For Model Set 1 and Model Set 2, these rows of coefficients represent a model which included only, public funding, parental involvement, informed consent, and waiting periods. For Model Set 3, all seven policy variables are included simultaneously.

Table 7.6. Odds Ratios for the Likelihood of Abortion vs. Live Birth: Tests of Specific Hypotheses.

Variables	Model Set 1: Controlling for Time and Episode†		Model Set 2: Model Set 1 + Independent Variables from the Trimmed Covariates Model	
Does the effect of a family cap policy matter more for women that already have at least one child?				
Family Cap	0.995	(0.773-1.279)	1.134	(0.880-1.461)
Previous Birth	0.680*	(0.467-0.990)	1.034	(0.706-1.515)
Family Cap X Previous Birth	1.028	(0.702-1.504)	1.006	(0.707-1.431)
Does the effect of a parental involvement law matter more for minors than for older women?				
Parental Involvement	0.531***	(0.410-0.688)	0.450***	(0.341-0.593)
Respondent a Minor	0.999	(0.651-1.534)	0.978	(0.612-1.564)
Parental Involvement X Respondent a Minor	0.977	(0.604-1.583)	0.889	(0.540-1.462)
Does the effect of restrictions on public funding of abortion matter more for women on welfare than for other women?				
Public Funding	0.468***	(0.367-0.597)	0.453***	(0.353-0.581)
Currently participating in WIC	0.483**	(0.302-0.773)	0.604	(0.352-1.035)
Public Funding X Currently participating in WIC	1.805*	(1.030-3.163)	1.542	(0.849-2.801)

Standard errors are adjusted for multiple observations from the same individuals. 95% confidence intervals are reported in parentheses. *$p < .05$; ** $p < .01$; *** $p < .001$

†In the first set of models, I ran separate models for each set of policy variables, controlling only for measures of time and episode. In the second set of models, I ran separate models for each set of policy variables, controlling for measures of time and episode, and all of the covariates included in the trimmed model.

Table 7.7. Odds Ratios for the Likelihood of Abortion vs. Live Birth: Individual State Policy Summary Scores.

Variables	Model Set 1: Controlling for Time and Episode†		Model Set 2: Model Set 1 + Independent Variables from the Trimmed Covariates Model		Model Set 3: Model Sets 1 & 2 + State Fixed Effects	
Stringent Welfare State	0.605***	(0.488-0.749)	0.647***	(0.516-0.811)	3.917*	(1.098-13.973)
Number of Welfare Policies	0.804***	(0.728-0.888)	0.845**	(0.765-0.933)	2.381*	(1.122-5.054)
Stringent Abortion State	0.553***	(0.445-0.688)	0.469***	(0.372-0.591)	0.773	(0.344-1.738)
Number of Abortion Policies	0.805***	(0.740-0.877)	0.781***	(0.717-0.850)	1.110	(0.786-1.568)

Standard errors are adjusted for multiple observations from the same individuals. 95% confidence intervals are reported in parentheses.
*$p < .05$; ** $p < .01$; *** $p < .001$
†In the first set of models, I ran separate models for each policy variable or set of policy variables, controlling only for measures of time and episode. In the second set of models, I ran separate models for each policy variable or set of policy variables, controlling for measures of time and episode, and all of the covariates included in the trimmed model. The third set of models is the same as model set two, but state fixed effects variables have been added as controls.

Table 7.8. Odds Ratios for the Likelihood of Abortion vs. Live Birth: State Policy Typologies.

Variables	Model Set 1: Controlling for Time and Episode†		Model Set 2: Model Set 1 + Independent Variables from the Trimmed Covariates Model		Model Set 3: Model Sets 1 & 2 + State Fixed Effects	
<u>Welfare & Abortion Policy Interactions:</u>						
Stringent Welfare/Stringent Abortion	0.398***	(0.298-0.532)	0.353***	(0.261-0.477)	2.742	(0.588-12.781)
Stringent Welfare/Lenient Abortion	0.701*	(0.526-0.935)	0.716*	(0.529-0.970)	3.965*	(1.110-14.165)
Lenient Welfare/Stringent Abortion	0.630**	(0.465-0.855)	0.494***	(0.354-0.689)	1.008	(0.180-5.644)
Lenient Welfare/Lenient Abortion (ref.)						
<u>Welfare & Abortion Policy Interactions (Alternate Coding):</u>						
Stringent Welfare State	0.701*	(0.526-0.935)	0.716*	(0.529-0.970)	3.965*	(1.110-14.165)
Stringent Abortion State	0.630**	(0.465-0.855)	0.494**	(0.354-0.689)	1.008	(0.180-5.644)
Stringent Welfare State X Stringent Abortion State	0.901	(0.584-1.390)	0.997	(0.637-1.560)	0.686	(0.099-4.760)

Standard errors are adjusted for multiple observations from the same individuals. 95% confidence intervals are reported in parentheses.
*$p < .05$; ** $p < .01$; *** $p < .001$
†In the first set of models, I ran separate models for each policy variable or set of policy variables, controlling only for measures of time and episode. In the second set of models, I ran separate models for each policy variable or set of policy variables, controlling for measures of time and episode, and all of the covariates included in the trimmed model. The third set of models is the same as model set two, but state fixed effects variables have been added as controls.

Table 7.9. Results of Hypotheses on the Effects of State Welfare and Abortion Policies on the Likelihood of Abortion

Hypothesis:	Result:
H1: Individual, family, and sociocultural factors are related to the likelihood of abortion among pregnant young women.	Confirmed
H2: After controlling for the effects of other factors, state family formation related welfare policies and abortion policies are related to the likelihood of abortion among pregnant young women.	Mixed
H2a: Stringent state family formation related welfare policies will increase the likelihood of abortion among pregnant young women.	Opposite
H2a1: Pregnant young women residing in states with a family cap policy will have higher odds of abortion.	No evidence
H2a1a: The effects of a family cap policy will be stronger for women who already have a child than for women with no children.	No evidence
H2a2: Pregnant young women residing in states where a current pregnancy is not counted towards welfare eligibility will have higher odds of abortion than pregnant young women residing in states without this policy.	Opposite
H2a3: Pregnant young women residing in states with a relatively low maximum cash benefit amount will have higher odds of abortion than pregnant young women residing in states with a relatively high maximum cash benefit amount.	Opposite
H2a4: Pregnant young women residing in stringent welfare states will have higher odds of abortion than pregnant young women residing in lenient welfare states.	Opposite/ Mixed
H2a5: Pregnant young women residing in states with multiple stringent family-formation related welfare policies will have higher odds of abortion than pregnant young women residing in states with few or no stringent welfare policies.	Opposite/ Mixed
H2b: Stringent state abortion policies will decrease the likelihood of abortion among pregnant young women.	Probable
H2b1: Pregnant young women residing in states where public funds may not be used to pay for abortion will have lower odds of abortion than pregnant young women residing in states where public funds are available for abortion.	Probable
H2b1a: The effects of public funding of abortion will be stronger for women on welfare than for other women.	No evidence
H2b2: Pregnant young women residing in states with a parental involvement law will have lower odds of abortion than pregnant young women residing in states without a parental involvement law.	Probable
H2b2a: The effects of parental involvement laws will be stronger for minors than for older women.	No evidence
H2b3: Pregnant young women residing in states with a mandatory waiting period before abortion will have lower odds of abortion than pregnant young women residing in states without a mandatory waiting period.	Probable
H2b4: Pregnant young women residing in states with mandatory informed consent procedures will have lower odds of abortion than pregnant young women residing in states without mandatory informed consent procedures.	No evidence
H2b5: Pregnant young women residing in stringent abortion states will have lower odds of abortion than pregnant young women residing in lenient abortion states. .	Probable
H2b6: Pregnant young women residing in states with multiple stringent abortion policies will have lower odds of abortion than pregnant young women residing in states with few or no stringent abortion policies.	Probable
H2c: The overall effects of state welfare and abortion policy stringency on pregnant young women's odds of abortion will be additive.	Mixed
H2c1: Abortion will be the most likely among pregnant women residing in states with stringent welfare and lenient abortion policies.	Opposite/ Mixed
H2c2: Abortion will be the least likely among pregnant women residing in states with lenient welfare and stringent abortion policies.	Opposite/ Mixed

Table 7.10. Correlations between State Abortion Outcomes and State Welfare Policy Typologies

	State Outcome:	
State Welfare Policy Variables :	Abortion Rate	Abortion Ratio
Stringent Welfare State	-.007	-.074
Number of Welfare Policies	-.086	-.146*

Standard errors are adjusted for multiple observations from the same states; * $p < .05$

CHAPTER EIGHT: Conclusion

I began this project with the goal of answering three main questions: 1) Do states that adopt stringent family formation related welfare policies also tend to adopt stringent abortion policies; 2) Do state welfare and abortion policies in the era of welfare reform affect the likelihood of pregnancy among a sample of young women; and, 3) Do state welfare and abortion policies in the era of welfare reform affect how pregnant women choose to resolve a pregnancy, either though live birth or abortion? I argued earlier that the answers to these three questions are likely to be dependent on one another. In this chapter I summarize the results of the three chapters of analyses and discuss how the interrelationships between the findings relate to other public policy issues. I also asses the limitations of the current research project, including internal threats to validity, and discuss directions for future research in this field.

Summary of Findings

In Chapter Four, I examined the family formation related welfare policies and the abortion policies for all 50 United States and the District of Columbia from January 1997 to December 2004. In general, individual state welfare policies were moderately correlated with one another (Pearson's *r* ranged from .22 to .42). Moreover, individual state abortion policies were also moderately correlated with one another (Pearson's *r* ranged from .21 to .61). These coefficients suggest that states that adopted a specific stringent welfare policy (e.g. a family cap) were more likely than states without that specific policy to adopt one of the other specific stringent welfare policies (e.g. a low benefit amount or the ineligibility of a current pregnancy). The same was true for the specific abortion policies, namely states that had adopted one of the

abortion policies had better odds of adopting one of the other abortion policies than did states that had not adopted that specific abortion policy. Taken together, these results suggest that states do not adopt specific policies in isolation, but that overall state welfare and abortion policy may be guided by broader, more fundamental ideas about welfare and abortion. For this reason, I constructed state welfare and abortion policy stringency summary scores, concluding that measures of overall state policy stringency may predict individual behavior better than individual policies.

In addition, I had theorized in Chapter Four that state welfare and abortion policies would be correlated overtime. However, with a few exceptions, specific state welfare policies were not significantly correlated with specific state abortion policies and vice versa. Moreover, the correlations between state welfare and abortion policy summary scores were mild (r =.11). Taken together, these results would suggest that the effects of state abortion policy and state family formation related welfare policy may not be working at cross purposes, contrary to what I had hypothesized in Chapter Two. I decided to empirically test this hypothesis as part of the analyses in Chapter Six and Chapter Seven.

In Chapter Six, using a modification of Bronfenbrenner's (1979) ecological systems theory and rational choice theory from the field of economics (Becker, 1991), I examined the predictors of pregnancy among the female respondents in the NLSY97. For the most part, after controlling for individual and family background characteristics, residing in states with specific stringent welfare and abortion policies was not significantly related to an increase in the odds of pregnancy among the women in the sample. Moreover, in the few cases where the specific stringent welfare and abortion policies were related to the odds of pregnancy, the effects were generally in the opposite direction of what was hypothesized. Similar results were observed

whether I examined the policy effects individually or all at once. As expected, the policy summary scores appeared to predict pregnancy better than the individual policies. However, once again, the observed effects were in the opposite direction of what I had anticipated. Instead of reducing the likelihood of pregnancy, residing in a state with stringent welfare policies or stringent abortion policies was associated with an increase in the odds of pregnancy.

In Chapter Seven, I examined the predictors of abortion versus live birth among the pregnant female respondents in the NLSY97. After controlling for individual and family background characteristics, residing in states with specific stringent welfare and abortion policies was generally related to a decrease in the odds of abortion among the pregnant women in the sample. Similar results were observed whether I examined the specific policies individually or all at once. As expected, the policy summary scores appeared to predict pregnancy better than the individual policies. In general, the results were consistent with expectations for abortion policy stringency, but the opposite of my hypotheses for welfare policy stringency. Residing in a stringent abortion state was associated with a decrease in the odds of abortion, but residing in a stringent welfare state was not associated with an increase in abortion (except in the state fixed effects models discussed later in this chapter).

How do we make sense of these disparate findings? In general, there is some evidence to suggest that state welfare policy stringency and state abortion policy stringency are mildly related. States with stringent family formation related welfare policies tended to have slightly more stringent abortion policies when compared with states with lenient family formation related welfare policies. However, there is little evidence to suggest that stringent welfare and abortion policies are working at cross purposes with one another. Evidence of this can be found by the fact that the effects of individual policy scores were similar whether examined individually or all

together. In other words, there was little evidence that the effects of state abortion policies were canceling out the effects of state welfare policies, and vice versa. Moreover, the main effects for welfare policy tended to operate in the same direction as the main effects for abortion policy for both the likelihood of pregnancy and the likelihood of abortion.

Table 8.1 displays the expected and observed effects, at the individual level, of stringent welfare and abortion policies. These results suggest that stringent welfare policies tend to increase the odds of pregnancy, while stringent abortion policies have little effect on the odds of pregnancy. Moreover, among the pregnant, these results suggest that stringent social policy, whether abortion policy or family formation related welfare policy, is related to a decrease in the likelihood of abortion. In other words, the abortion policies were having the expected effect on abortion, but no effect (or at least a limited one) on pregnancy. On the other hand, stringent welfare policies appeared to operate in exactly the opposite direction as anticipated, increasing the odds of pregnancy while decreasing the odds of abortion.

One explanation may be that in some instances fertility behaviors may be driving state policies more than state policies are driving fertility behaviors. This may indeed be the case for the family formation related welfare policies. In Chapter Four, I found a positive correlation between state teen birth rates and non-marital birth ratios and the stringency of their welfare policies. In other words, the states I coded as stringent on the welfare variables had higher than average rates of teen childbearing and non-marital births (see Table 4.4). Though I cannot definitively say whether state welfare policies are driven by state fertility behaviors, others have found this to be the case (Graefe et al., 2008). Moreover, given the grant structures in the TANF legislation, including the illegitimacy bonuses, states with high non-marital fertility had incentive

to reduce pregnancies among young, primarily single women. Therefore, the welfare policies may not be driving fertility behaviors as much as fertility behaviors are driving welfare policies.

With regard to abortion outcomes, I also observed a weak relationship between state welfare policy stringency and state abortion outcomes (see Table 7.10), suggesting that states with lower abortion rates were slightly more likely to pass strict welfare policies. However, it is important to remember that few would view welfare policy as a means of reducing abortion; instead, it was feared that welfare policy might indirectly lead to an increase in abortion. Therefore, if fertility behaviors really are influencing welfare policy, it is not surprising that there is only a small relationship between state abortion outcomes and state welfare policy stringency.

Though fertility behaviors may have influenced the family formation related welfare policies adopted by the states in the era of welfare reform (Graefe et al., 2006), this is not as likely to have occurred for the state abortion policies examined during this time frame. For one, many of the observed changes in abortion policies were a result of court decisions and not actions of the legislature. Moreover, many of the abortion policies were in place long before the era of welfare reform. Therefore, it is possible state policy makers were no longer adapting abortion policy to current fertility behaviors (if they ever had been), but that instead enough time had passed to observe the supposed effects of the abortion policies. As a result, it is not surprising that the abortion policies tended to have the expected effects on the likelihood of abortion.

It is also not surprising that state abortion policy stringency was only weakly related (if at all) to the likelihood of pregnancy. Though Levine and Staiger (2002) found that women tend to take more sexual risks in the presence of lenient abortion policy, it is unlikely that many women view access to abortion as directly lowering the cost of pregnancy. For one, abortion is a

difficult decision and relatively inexpensive and effective methods of contraception are typically available. Moreover, there is a significant difference between an attitude of "I am trying to avoid pregnancy, but *if* I do get pregnant I will get an abortion" versus an attitude of "Abortion is easy to obtain, therefore I can afford to have an unwanted pregnancy." In other words, abortion policy is probably much more salient to those faced with an unwanted pregnancy, than it is to those deciding whether or not to get pregnant. If we return to the pregnancy decision tree in Figure 2.1, it is not surprising that abortion policy tended to have a greater effect on pregnancy resolution than on the choice to get pregnant, given that abortion policy is only indirectly related to the decision to get pregnant, but has a direct bearing on the decision of how to resolve a pregnancy.

Theoretical and Methodological Concerns

There are many other possible explanations for the observed results, though it would be difficult to asses the validity of each theory with the information provided here. However, there are also several theoretical and methodological concerns which may call into question the observed results of this study. Important theoretical threats to the internal validity of this study include the assumptions of rational choice models. The key methodological threats to the validity of this study include issues of aggregate means, sampling, measurement, and research design.

Under a rational choice framework, it is assumed that women make choices that optimize their utility based on their preferences. When applied to the effects of state welfare and abortion policies on pregnancy decisions, the theory assumes that women are aware and understand the implications of current state welfare and abortion policies. However, this assumption may not

always be tenable. At least for adolescent mothers, awareness of state policies tends to be low and state policies are rarely a salient factor in the decision to get pregnant. Though large proportions of teens are sexually active, only a minority get pregnant (Collins, et al., 2002), and of those who do get pregnant, the majority of the pregnancies are a result of an accidental conception (Maynard, 1995). Moreover, of those that choose to give birth, less than one in four of the births are wanted (Lindberg et al., 1997). In the words of one teen mother, "You're young, you're madly in love with this guy, and you go and have this baby. Welfare doesn't have nothing to do with your having babies. Nothing. Nothing whatsoever" (quoted in Hagen & Davis, 1994, p.33). Kath Edin's work among older, poor single mothers also suggests that at best the pregnancies are 'semi-planned'—most of the mothers were not actively seeking a pregnancy, but they were not actively trying to prevent one either (Edin & Kefalas, 2005). Taken together, these results would suggest that either not all pregnancy decisions are rational (see Bane and Ellwood, 1994), or that state welfare policies are not always a consideration in these rational decisions.

An additional reason for the low observed effects of state policies on pregnancy decisions may have involved the coding of state policies. Policies were coded only for the months that they were enforced. However, it is possible that an individual's knowledge of state policies and the influence of state policies on their decisions are not directly related to the exact dates the policies are enforced. It is often the case that many policies do not go into effect until a few months after they are signed into law. If policy debates are highly visible and the results of legislative activity are widely publicized, it is possible that a new policy could greatly affect pregnancy decisions long before it is ever actually enforced. On the other hand, if a new policy is not widely known, then it may take a few months after enforcement begins for the policy to

have an immediate effect on the rational choices of individuals. It is therefore possible that the strict month by month policy coding used in this analysis may not be capturing some of the potential effects of state welfare and abortion policies on pregnancy decisions. In order to better test the rational choice model, it would be helpful to directly measure individuals' awareness of current policies and the effects of these policies on their pregnancy decisions, a topic I discuss in greater detail in the section on future research below.

For most of the policies the effects were null. In other words, the policies did not appear to have an affect on young women's pregnancy decisions. One interpretation would be that the policies did in fact have no observable effect. However, a null result can also occur when a variable has a significant, though opposite relationship on two subgroups. When an aggregate mean is estimated these opposing relationships can cancel out one another, thus leaving the appearance of an overall null effect. To test for this phenomenon, I ran a serious of models comparing the effects of specific state policies on various subgroups where I anticipated the policies may have a differential effect. In each case, the coefficients for the various subgroups were not significantly different from another. However, this does not mean that the estimated effects of these policies are the same for all subgroups, and it is still possible that the observed null results, largely estimated as aggregate means, may actually be masking significant though countervailing effects among certain subgroups. Additional research would be necessary to identify possible subgroups and any differential effects the various policies may have on them.

The results of this study may also be difficult to interpret because of the nature of the NLSY97 sample. The NLSY97 is a nationally representative sample of approximately 4,400 adolescent females ages 12-16 on December 31st, 1996 (Center for Human Resource Research, 2005) whose fertility histories largely take place after the passage of PRWORA in 1996. Though

4,400 may seem like a large sample, it may not have been sufficient for these analyses. For one, all of the respondents are relatively young. The oldest respondents were 24 years old at the end of this study, and the youngest were only 20 years old. Table 8.2 displays the fertility rates for the United States by age group for the year 2004, the final year of this study. Most of the women in the sample had yet to enter the period of life when they were most likely to experience a pregnancy. Moreover, it is estimated that roughly 80% of the women in the sample will go on to have a child at some time (Martin et al., 2006); however, as of the conclusion of this study only about one in six had ever been pregnant. Given their ages, it is likely that the vast majority of the women in the sample planned to avoid pregnancy for reasons other than the current welfare and abortion policies (e.g. too young, not in an established relationship, still in school, etc.). As a result, only a small portion of the 4,400 women in the sample were likely to be influenced by the welfare and abortion policies. Moreover, of the pregnancies that were observed in the sample, roughly ten percent were conceived by married women, another group not likely to be influenced by current welfare and abortion policies.

Most welfare and abortion policies are targeted at unmarried women (Klerman, 1998). Under a rational choice framework, Klerman argues that pregnant women have one of four possible outcomes: 1) Abort the pregnancy; 2) Marry the father; 3) Raise the child as a single mother without welfare assistance; and, 4) Raise the child as a single mother with welfare assistance. However, he argues that the decisions of how to resolve a pregnancy have largely been determined before women get pregnant, thereby affecting their decisions to have sex and use contraceptives. In other words, how they would resolve a pregnancy is highly related to their likelihood of getting pregnant. When viewed in this light, Klerman argues that the only women likely to be affected by strict family formation related welfare policies are the women who had

planned to raise a child as a single mother on welfare before the implementation of stringent welfare policies. Moreover, he further argues that the only women affected by strict abortion policy would be women that had planned to resolve a pregnancy through abortion in the absence of strict abortion policies. The NLSY97 contains no measures of women's planned pregnancy decisions prior to conception, and therefore it was impossible to identify women's preferences a priori. However, this does suggest that though the sample size at the outset was fairly large, the subsamples critical to many of the analyses were considerably smaller. In other words, the subset of unmarried women who had chosen a priori to resolve a pregnancy either through abortion or welfare assistance, and were therefore likely to be directly influenced by current welfare and abortion policies, is likely to be much smaller than the 4,400 used in the analyses.

In addition to the relatively small sample size, the uniqueness of the age structure of NLSY97 sample may also complicate the interpretation of the results of this study. The fertility rates in Table 8.2 also suggest that the likelihood of pregnancy should have increased as these women aged, and the results presented in Chapter Six confirm that older respondents were more likely to get pregnant than younger respondents, and individual respondents were more likely to get pregnant near the end of the study than near the beginning. This is important, because the results of Chapter Four suggest that state welfare policies tended to become more stringent throughout the course of the study. As a result, in general the women in the study were more likely to be residing in a stringent welfare state in the years when they were at the greatest risk for pregnancy[1]. Even though I controlled for the passage of time and the respondents' ages, this phenomenon may partially explain why residing in a stringent welfare states was associated with an increase in the odds of pregnancy within a given month, a result contrary to expectations.

[1] The sample sizes were small, but I did perform a quick test of whether or not the women tended to move to more lenient or stringent states during the time of the study, which are not presented here. I found no consistent pattern that suggested that women, on average moved to more lenient or more stringent states.

Moreover, in general younger women are more likely to seek an abortion than are older women (Jones, Darroch, Henshaw, 2002); and therefore, the changes in welfare stringency as the population aged may also partially explain why stringent welfare policies were also associated with a decrease in the odds of abortion among pregnant women.

Another problem with using the NLSY97 sample to examine the effects of welfare policies implemented by states after the welfare reforms of 1996, is that almost all of the pregnancies experienced by this group occur during the era of welfare reform. Ideally, one would have compared the pregnancy decisions of this sample to a similar sample of women examined in the years leading up to welfare reform in order to determine whether the implementation of these policies had changed the calculus involved in the pregnancy decisions. As is, the current study allows us to compare only women from stringent states with women from lenient states. However, states are likely to differ on measures other than their welfare policies, and in this analysis, there is no method of comparing the decisions of a similar group of woman within the same state before and after the implementation of specific state policies. As a result, in this analysis it is difficult to isolate a true policy effect, and there is always the possibility that some other set of unmeasured state variables may be driving the observed state policy effects.

Given that the sample only allowed me to compare women from stringent states with women from lenient states without accounting for other differences between the states, I tried to counter this by using state fixed effects dummy codes to control for the unmeasured heterogeneity between the states. However, given the nature of the NLSY97 sample, this method proved to be somewhat problematic. The NLSY97 sample was representative at the national level, but not necessarily representative within each individual state. In fact, for at least

seven states no respondents were originally selected for the sample and the only data from those states comes from migrants who moved into those states during the course of the study. More than likely, the migrant respondents are not representative of the population of young women from those states. As a result of the differential sampling by state, it is difficult to determine what the fixed effects variables are measuring. Are they controlling for unmeasured differences between the populations of each state, or instead mathematically are they controlling for artificial differences between respondents from the various states as a result of sampling? As a result, as Klerman (1998) warned, data of this sort are useful for looking at individual and family level factors associated with pregnancy and pregnancy resolution, but the small, non-representative samples for each state are not well suited for examining the effects of specific state policies.

In addition to sampling, measurement issues may also adversely influence the results of this study and complicate the interpretation of the results. As was discussed earlier, not all of the state policies are likely to affect the pregnancy decisions of all of the women in the sample. For example, state welfare policies are likely to only influence the pregnancy decisions of those either currently on welfare or those at risk of possibly needing welfare assistance from the government at some future point in the event of a pregnancy. In other words, welfare policies, if they do influence women's pregnancy decisions, are likely to only influence the decisions of the less fortunate. Therefore, though the sample is somewhat large, including everyone in the analysis of the effects of welfare policy—and not just those likely to be influenced by welfare policy—may be masking the effects of these policies.

In order to test for this oversampling effect I estimated the effects of welfare and abortion policies for three 'target groups' and found no differential effects. However, in each case I was missing an important factor that should have been included in the models: a measure of the

respondent's access to financial resources. The statistical models were based on proximal predictors measured for each month, and income for a respondent was measured at yearly intervals, and only in the years that the women in the sample responded to the survey. For most of the respondents this was a very unpredictable period of life. Many went in and out of school, employment, relationships including marriage, and even residence in their parents' households, all of which are likely to affect an individual's income and access to financial resources from month to month. Because of the difficulty in getting a good measure of monthly financial resources, financial resources were not included in the models; but instead measures of marital status, employment, welfare participation, and education were included. However, perhaps even just a crude measure of income, even if averaged across a year should have been included.

Also absent from the model are a few important predictors of abortion. In the models presented here, abortion has been viewed as a rational choice where a pregnant woman compares the costs of childbearing to the costs of obtaining an abortion and then makes a choice consistent with her preferences. Personal and family background characteristics, pregnancy histories, and state welfare and abortion policies were assumed to represent the various costs and preferences associated with this choice. However, the model does not contain any information about the characteristics of the fetus, an important unmeasured piece of information critical to the pregnancy resolution decision. For example, Cheffins et al. (2000) report that the prevalence of Down Syndrome has decreased significantly as a result of more prenatal genetic screenings, which often result in the abortion of high risk fetuses. Moreover, rates of prenatal care and prenatal screening differ by race, which may partially explain why Blacks and Hispanics are less likely to elect to have an abortion when compared with their White counterparts (Singer, Antonucci, & Van Hoewyk, 2004). In addition, with the exception of marital and cohabitation

status at the time of conception, the analyses contains no information about the partners of the women, in the sample, which have been shown to affect pregnancy decisions (Edin & Kefalas, 2005; Evans, 2001; Lindberg et al., 1997; Zavodny, 2001).

Directions for Future Research

Though several steps could have been taken to improve the internal validity of the results presented here, the many methodological concerns associated with the NLSY97 sample make it difficult to accurately asses the effects of state welfare and abortion policies on women's pregnancy decisions. Given the drawbacks to using survey data for these types of questions, Klerman (1998) suggests that the best way to assess the effects of welfare and abortion policy on fertility decisions is to compare state birth, welfare, and abortion rates before and after the implementation of specific welfare and abortion policies, and to use state fixed effects to control for unmeasured state heterogeneity. Using this methodology New (2007) finds that parental involvement laws effectively lead to a decrease in abortion for minors. However, New focused solely on abortion policy, and did not account for state welfare policies. The results of Chapter Four suggest that, though state welfare and abortion policies are not strongly correlated, the relationships are strong enough to suggest that in order to determine the effects of change in one policy type (either stringent abortion or welfare), researchers should control for change in the other type.

Sabia (2008) provides a good example of how researchers may address these questions. Using state level birth and abortion data from 1984 to 1998, Sabia examined the effects of a family cap policy on state non-marital pregnancy rates and abortion rates. In addition to using many state level predictors (e.g. measures of poverty, wages, population age and race structures,

state government party affiliation, marriage markets, etc.), Sabia also includes measures of multiple policies of both state welfare and abortion policies including state welfare benefit levels, the stringency of welfare waivers, parental involvement laws, and whether states allow for the public funding of abortion. He finds that the family cap is associated with a decrease in non-marital pregnancy rates, non-marital birth rates, and the non-marital abortion rates, and that these results are robust after controlling for other welfare and abortion policies.

Unlike the analyses presented in Chapter Six and Chapter Seven, by using nested models, Sabia was able to determine where in the pregnancy decision tree (see Figure 2.1) abortion and welfare laws are likely to have their effects. For example, he finds that the family cap is associated with a reduction in non-marital birth rates. The nested nature of his model allows him to further determine that family cap policies lead to a decrease in non-marital birth rates because these policies reduce non-marital pregnancy rates, but do not appear to drive down non-marital birth rates by increasing the likelihood of marriage or abortion among pregnant women. In the analysis presented here, the choices in the pregnancy decision tree were treated as distinct events: the first analysis examined the effects of policies on the likelihood of pregnancy among all women; the second analyses looked at the likelihood of abortion among pregnant women. However, it is possible that strict abortion policy may decrease the likelihood of abortion among all women by convincing those who would seek an abortion in the event of a pregnancy to more aggressively prevent pregnancy than they would otherwise (Klerman, 1998). In this study, such a relationship can only be indirectly inferred by comparing the results of the analyses of the two chapters (and in this case, in Chapter Six, we do not find conclusive evidence that strict abortion laws reduce the likelihood of pregnancy among the women in the sample). In the future, nested

models are more likely to increase our understanding of the complex nature of pregnancy decisions than are analyses that examine these decisions in isolation.

One drawback to the Sabia analysis is that his data only run through 1998, and therefore only include two years of data after the implementation of PRWORA in August of 1996. Though most changes in family formation related welfare policies occurred shortly after the passage of PWRORA (Graefe et al., 2006), it would be interesting to see the effects of welfare policies for more recent years. Moreover, in Sabia's analysis he examined the effects of specific welfare and abortion policies, but it would be interesting to determine the effects of state policy summary scores for welfare and abortion policy on macro levels of nonmarital pregnancy and abortion.

Though Klerman (1998) suggests that questions about the effects of state policies on abortion and non-marital childbearing are best answered with macro level data, this does not mean that significant insight cannot be gained through micro level analysis and data. For one, micro level analyses allow for the examination and control of individual and family level variables. It is possible that state policies have an affect on some subgroups but not others, a fact that is masked when comparing overall state rates (Sabia, 2008). Moreover, rational choice models suggest that women weigh the expected costs of certain outcomes and make the most rational pregnancy decisions based on their preferences. However, women's pregnancy preferences are rarely measured, and are typically determined by researchers only after the fact (Tilly, 1997). In addition, it is assumed that women take into account the effects of state welfare and abortion policies; however this assumed mechanism is difficult to verify without a measure of the women's knowledge and awareness of state policies. Individual level survey data may have much to add to the debate over the effectiveness of state welfare and abortion policies if in

the future researchers are able to measure respondent's awareness and understanding of state policies and to accurately assess women's preferences before measuring their ultimate decision. Moreover, in determining the utility of state policy summary scores, it may be helpful to gather respondents' impressions of their state welfare and abortion policy stringency. Do they view these as individual policies, or do they merely consider their states to be more or less stringent than another state? These additional micro analyses would help to verify the assumed micro-macro link between state policies and individual decisions outlined in Chapter Two (see Figure 2.2).

Another issue that could be resolved with further research is the notion of reverse causality, or the idea that during the era of welfare reform, welfare policies were not driving fertility behaviors as much as fertility behaviors were driving welfare policies. If this phenomenon is real, then studies that examine the effects of these policies by comparing the fertility outcomes of stringent states to those of lenient states will consistency find that stringent policies are actually associated with an increase in the targeted pregnancy and fertility outcomes. A better model would be a within state model that looks at the aggregate state fertility and pregnancy rates before and after the implementation of these policies for the states that adopted them, while controlling or other state period effects.

Final Thoughts

Choosing to get pregnant and then how to resolve a pregnancy are complicated and interrelated decisions. I return to the three questions at the start of this chapter: 1) Do states that adopt stringent family formation related welfare policies also tend to adopt stringent abortion policies; 2) Do state welfare and abortion policies in the era of welfare reform affect the likelihood of pregnancy among a sample of young women; and, 3) Do state welfare and abortion

policies in the era of welfare reform affect how pregnant women choose to resolve a pregnancy, either though live birth or abortion?

I believe that I was able to provide a defensible answer to the first question. Between 1997 and 2004, states that had adopted stringent abortion policies were somewhat more likely to have adopted stringent family formation related welfare policies, though the effects are not very strong (summary scores for the two policies types are mildly correlated, $r = .11$). With regard to the final two questions, the nature of the data make it difficult to draw any substantive conclusions. For one, state policies were the only state level factors included in the models, and it is probable that other state level variables are not only likely to be associated with individual pregnancy decisions, but also associated with the adoption of specific state welfare and abortion policies. Moreover, given the size and nature of the sample, the state fixed effects were an insufficient means of dealing with this issue.

Though I can only provide a defensible answer to one of my three main questions, this study did help to partially answer some other questions. For example, the results here suggest that in many cases, state summary scores may be a more useful way of examining the effects of state policies on individual pregnancy decisions than are the examination of specific state policies. Moreover, the results here support Klerman's (1998) notion that unless sample sizes are sufficiently large, in his estimation a minimum of 50,000 respondents would be necessary, national survey data may not be appropriate for assessing the effects of welfare reform on non-marital births or abortion. However, having said that, future survey data, if the appropriate measures of women's awareness and preferences are recorded, may be useful in helping us to better understand how state policies shape women's individual pregnancy decisions.

Table 8.1. The Hypothesized and Observed Effects of Welfare and Abortion Policy on Pregnancy and Abortion at the Individual Level.

	Likelihood of Pregnancy (Entire Sample)		Likelihood of Abortion (Among Those Pregnant)	
	Expected	Observed	Expected	Observed
Policy Main Effects:				
Lenient Welfare Policy	up	down	down	up
Stringent Welfare Policy	down	up	up	down
Lenient Abortion Policy	up	no effect (inconclusive)	up	up
Stringent Abortion Policy	down	no effect (inconclusive)	down	down
Policy Interaction Effects Welfare/Abortion*				
Stringent/Stringent	down	up	no effect	down
Stringent/Lenient	no effect	up	up	down
Lenient/Stringent	no effect	up	down	down
Lenient/Lenient	up	down	no effect	up

*For the above policy combinations, the first listed is for welfare, and the second is for abortion (e.g., Stringent/Lenient means stringent welfare policy and lenient abortion policy).

Table 8.2. Lives Births per 1,000 Women by 5-Year Age Group, United States, 2004.

Age Group	Birth Rate
10-14 years	0.7
15-19 years	41.1
20-24 years	101.7
25-29 years	115.5
30-34 years	95.3
35-39 years	45.4
40-44 years	8.9
45-49 years	0.5

Source: Adapted from Table 4 in: Martin, J.A., et al. (2006). Births: Final data for 2004. *National Vital Statistics Reports; vol 55 no 1*. Hyattsville, MD: National Center for Health Statistics.

APPENDIX: Coding Pregnancy Histories and Independent Variables.

Creating Respondent Pregnancy Histories from Waves 1-8 of the NLSY97:

The first step to creating a pregnancy history for all of the female respondents in waves 1-8 of the NLSY97 involved identifying all of the reported pregnancies within the various waves of the survey. In the first and all subsequent waves of the NLSY97, female respondents were asked whether they are currently pregnant, have ever been pregnant or have been pregnant since the date of the most recent interview. Respondents were also asked to provide information on the month and year that each pregnancy ended and the result of the pregnancy whether it was a live birth, stillbirth, miscarriage, or induced abortion. For all live births, the NLSY97 provides a variable indicating the birth month for each child. For non-live pregnancies, respondents are asked to report how many months along in the pregnancy they were when the pregnancy ended. For women that are currently pregnant, they are asked how many weeks along they are in their pregnancy. Using the information provided by these variables, it was possible to create the pregnancy histories for all of the female respondents in the NLSY97 up through their date of final interview.

In total, women in the sample experienced a total of 3,843 pregnancy events. 2,483 reported no pregnancy event, whereas 1,902 reported at least one pregnancy. The women gave birth to 2,290 children, resulting from 2,260 pregnancies that ended in live births (there were 28 sets of twins and one set of triplets). A small proportion of women gave their children up for adoption but the highest estimate of this event places it at 23 children or roughly 1% of the children born and 0.6% of all pregnancies (some women report the same adoption in multiple waves of data collection making it difficult to tally this event). Moreover, at least half of the children were adopted out after age two, and therefore not necessarily part of a pregnancy resolution decision. Based on this evidence, I elected to ignore the effects of adoption on the likelihood of pregnancy and pregnancy resolution for this sample. In addition to live births, the women experienced 721 miscarriages and stillbirths and 543 abortions. Moreover, the women reported an additional 68 pregnancies ending in non-live births, but the outcome was unknown, and another 251 women were pregnant at the time of their last interview, thus the outcomes of these pregnancies remain unknown.

The next step involved locating the end date for each of these pregnancies. For all live births, the pregnancy end date was assumed to be the birth month of the child. For non-live births, I utilized the years and months of pregnancy resolution provided by the respondents. In a small number of cases (N = 26), either the month or the year was missing. These dates were imputed based on the best guess deduced from available information. The most common method of imputation was to examine the information provided and using the age in years that the respondent reported that the pregnancy ended, identify the best possible month or year for the pregnancy to take place. When both a month and a year were missing, the pregnancy end date was determined to occur at the midpoint of the age provided. For example if a respondent reported being 13 years old, the month of pregnancy resolution was imputed at the month the adolescent turned 13.5 years old, unless the date of the previous or concurrent interview shortened the interval, in which case the pregnancy end date was imputed at the midpoint of this interval. For the 251 pregnancies that were in progress during a respondent's final interview, no pregnancy end date was calculated. For current pregnancies reported in other waves of data,

most of the end dates and outcomes were reported in subsequent interviews or corresponded with the birthdates of children. However, 63 women self-identified as currently pregnant in one interview but then provided no information about the end date or resolution of these pregnancies in subsequent interviews. Given that we know these pregnancies did not result in a birth, the resolution date was imputed as one month after the interview date in which they claimed to be currently pregnant, and the pregnancy resolution was marked as unknown. The reasoning behind this one month imputation will be explained below.

The next step in computing the pregnancy histories was to calculate the start dates for each of the pregnancies. For live births, the pregnancy start date was assumed to be nine months before the children's month of birth. For non-live births, respondents were asked how many months they were pregnant when the pregnancy ended. The pregnancy start date was calculated by subtracting the number of months pregnant when the pregnancy ended from the pregnancy end month. In the case of women that were currently pregnant during an interview that have no follow-up information, at each wave they were asked how many weeks they had been pregnant. The number of weeks pregnant was divided by 4.3 and subtracted from the month of the interview in order to determine the month in which the pregnancy began. After calculating these pregnancy start dates, it was possible to determine the average length of pregnancy for the women that had a non-live pregnancy. For the 63 women with a non-live pregnancy and no end date, adding one month to each of their pregnancies gave them an average length of pregnancy within a quarter of a month of the women with both a pregnancy start and end date. Therefore, the decision was made to calculate these pregnancy end dates as one month beyond the interview date.

The partial pregnancy histories for eight women were discarded from the analysis due to missing data or perceived data error. For example, in five cases women mention having a pregnancy but provide no information on the timing or the outcome of the pregnancy. Only these pregnancies were dropped from their pregnancy histories. In two additional cases women claim to have a pregnancy that ended in abortion, but also claim to have had the abortion before the women themselves were born. A final respondent provided accurate and complete information for her first three pregnancies within a wave a data collection, but then provided nonsensical information for seven additional pregnancies. For example, many of the pregnancies overlapped on another, and on a few she claimed to be more than 10 months along at the time the pregnancy ended. These seven pregnancies were assumed to be a result of data collection error.

After calculating the pregnancy outcomes and start and end dates a series of variables were created to determine the previous pregnancy history for each woman. The first variable indicated the number of previous pregnancies a woman had experienced. Each pregnancy event was coded as a single pregnancy regardless of the outcome. For example, twins or a multiple miscarriages, though they may have been two births or three simultaneous miscarriages, this was coded as a single pregnancy. A second variable was created to indicate the number of previous children born to each woman at the start of a pregnancy. In this situation, twins counted as two previous births but one previous pregnancy (this applies to 28 twins and 1 set of triplets). A similar variable was constructed for the number of previous abortions and stillbirths or miscarriages a woman had experienced. However, each of these events was coded as a single pregnancy and abortion or miscarriage, despite the number of fetuses that may have been lost (this applies to 16 pregnancy events). For example, one respondent, on two separate occasions, reported miscarrying a set of quadruplets (likely a result of the use of fertility drugs). In each case it was counted as a single pregnancy and a single miscarriage.

The previous miscarriage, abortion and birth variables form a linear combination of the variable indicating the previous number of pregnancies, with the exception of multiple parity births and the 68 pregnancies where the outcome of the pregnancy is unknown. Because I was interested in the impact of the type of previous pregnancy on future pregnancies, the three variables indicating the type of pregnancy were used in the analysis in place of a single variable indicating the number of previous pregnancies. These three variables were converted into monthly variables in order to indicate the pregnancy histories for each woman for each month between January 1997 and the month of the final interview that a woman contributes to the analysis.

With the pregnancy histories complete I was also able to create a variable that indicated the months a woman was at risk for a pregnancy based on the end dates for each pregnancy (see *Months at Risk*, below).

Independent Variable Coding:

Measures of Time:

Date of Birth. This variable indicates the century month in which the respondent was born. January, 1980 = 1; February, 1980 = 2; etc. Though this variable was not used as a predictor in the analysis, it was used for the construction of several other variables.

Calendar Month. This variable signifies the calendar month of each month that an individual contributes to the sample. January, 1997 = 205; February, 1997 = 206; etc.

Age in January, 1997. This variable represents a respondent's age in months in January, 1997 and was calculated by subtracting a respondent's month of birth from 205, the calendar month value for January, 1997.

Months at Risk. For each month a respondent contributes to the analysis, this variable indicates the number of months an individual has been at risk for a pregnancy. This variable was calculated as the number of months since the end of their last pregnancy. If a respondent had not ever been pregnant in that month then this variable was calculated as the number of months since they turned 150 months old. This value was chosen because 150 months was the average age at menarche for the weighted sample, and has been found by others to be the average age at menarche for the females within the United States (See Forrest, 1993). If the respondents had not yet ever been pregnant and were not 150 months old by January, 1997 then this variable was coded as the number of months since January, 1997. This final coding was applied to 395 individuals (9% of the sample) whose ages in January, 1997 ranged from 145-149 months, with an average age of 147 months.

Person Level Independent Variables:

Race. During the wave one interview, respondents were asked to report their race and origin using a series of items. The first question asked respondents whether or not they were Hispanic.

The second item had them identify as: 1) White; 2) Black or African American; 3) American Indian, Eskimo, or Aleut; 4) Asian or Pacific Islander; and, 5) Something Else. In the third item respondents reported whether they were: 1) Black; 2) Hispanic; 3) Mixed Race (Non-Hispanic); or, 4) Non-Black / Non-Hispanic. From these variable a final race variable was constructed with the following groups; 1) White; 2) Black; 3) Hispanic; and, 4) Mixed Race or Other. Table A.1 displays how the race variable was constructed:

Age at Menarche. This variable records a respondent's age in months when she experienced her first menstrual cycle. At each interview wave girls that reported having had their first period were asked the month and year that this event took place. Using these values and their month of birth, I could calculate the age in months at first menarche for 4080 respondents. Another 250 respondents do not know the exact month or year, but report their age in years at first menarche. The age at menarche for these individuals was imputed as their midpoint in months for their reported age. For example, if they reported that their first period occurred at age 12, then they were given a value 150 months or 12.5 years for their age at first menarche. A flag was crated to identify respondents that had their age at menarche imputed in this fashion. For the remaining 55 respondents the imputation was more complex and a separate flag was created. Two respondents provide a year but no month or age and are therefore imputed as July of that year. An additional 22 respondents reported having their period before the date of the first interview, but either did not know when it occurred or refused to answer when it occurred. These women were assigned the average age at menarche in months for girls their same age that reported they had experienced their first period by the first interview. Eight respondents reported having their first period between subsequent interviews, but provide no information on the timing of that event. The age in months at first menarche for these eight individuals was imputed as their age in months during the month that was the midpoint between these two interview months. Another three respondents claim to have never had their period; these were coded as their age in months at their final interview plus one. The final 20 respondents provide no information about their age at menarche because they either refused to answer these questions or were never asked these questions. These individuals were assigned the mean age at menarche for the entire sample (149 months).

Age at First Sex. The NLSY97 asks respondents to report the age in years when they first had voluntary sexual intercourse. 3,748 respondents provide report an age at first sex, with a mean of 16.05 years. Another 90 respondents appear to have had sex at some point—they report a pregnancy, marriage or cohabitation—but they provide no age at first sex. These individuals were assigned the age of 16 and a flag was created to identify them. For the remaining 637 respondents it appears that they have never had sexual intercourse by the time of their last interview. These individuals were also assigned the mean for this variable (16) and a flag was created to identify them. In the final analysis this flag was dropped because a) it either perfectly predicted failure in the pregnancy prediction analysis; or b) was coded zero for all respondents in the analysis of pregnancy resolution.

CAT-ASVAB. During the first round of the interview the majority of the respondents completed the computer-adaptive form of the *Armed Services Vocational Aptitude Battery (CAT-ASVAB).* The ASVAB measures respondents' abilities in several topical areas and is a rough measure of their intelligence and academic achievement and aptitude (CHRR, 2006). The NLSY staff used

sample weights and respondent's scores on the Mathematical Knowledge, Arithmetic Reasoning, Word Knowledge, and Paragraph Comprehension sections of the ASVAB in order to create a general, age-normed, percentile score for each respondent that completed the test. 3503 respondents (79.9%) had a valid score on this variable ranging from 0 to 100 with a mean of 46.3 a standard deviation of 28.5. The 882 respondents without a valid score were assigned the mean of 46.3 and a flag was created to identify these individuals.

Previous Pregnancies. For each month in the sample, a set of variables indicates the number of previous births, abortions, and stillbirths/miscarriages a female respondent has experienced (see pregnancy histories above).

Employment. Starting with the week an individual turns 14 years of age, the NLSY97 contains a weekly event history variable that determines the employment status of an individual. The possible employment designations include:

0	No information reported to account for week; job dates indeterminate
1	Not associated with an employer, not actively searching for an employer job
2	Not working (unemployment vs. out of labor force cannot be determined)
3	Associated with an employer, periods not working for the employer are missing
4	Unemployed
5	Out of the labor force
6	Active military service
9700+	Employer on roster (currently working)

During the weeks before an individual turned 14 years of age, they were assumed to be out of the labor force. Those either in active military service or those with their employer registered on the roster were coded as working for that week. In order to collapse the weekly variables into a monthly variable, any week in which at least three week days fell within a calendar month was counted towards the employment status for that month. To determine the employment status for the month, if a respondent worked during any of the weeks during a calendar month they were coded as being employed for that calendar month and zero otherwise. A monthly dummy coded employment variable was then constructed for each respondent for every month from January 1997 until the month of their final interview.

Educational Enrollment. Beginning with the month of the first survey and until the month of the last interview, the NLSY97 contains a monthly created variable that indicates a respondent's school enrollment status. For each month, respondents coded by the NLSY97 as either: 1) Not enrolled; 2) Attending grade K-12; 3) Attending college; 4) On vacation; 5) Expelled from school; or, 6) Other. A monthly dummy code was created to determine whether or not students were enrolled in school. These categories were collapsed so that anyone attending grades K-12, attending college, or on vacation were coded as in school. The top panel of Figure A.1 displays the number of respondents enrolled in school from January, 1997 until December, 2004 as reported by the event history variables available in the NLSY97. Few students are enrolled in school during the early months of 1997 because few respondents have entered the survey at that point; therefore, it was necessary to impute the school enrollment for each respondent from January, 1997 until the date of their first interview. The average length of imputation in this fashion was 3.9 months per respondent with a median of 3 months. During the first wave of data

collection respondents were asked to report retrospectively on the grade they started in the fall of 1996. Moreover, they were asked how many months of school they had missed during the 1996 school year. Those that reported missing one month or less were coded as enrolled in school for each month starting in January 1997 until May of that year, or until their month of fist interview, whichever came first. This approach was taken because it was impossible to determine whether the missed month of school occurred in the fall of 1996 or the spring of 1997. Those that reported having missed between 2 and five months of school during the 1996 school year were coded as in school but a flag was created to identify the imputed months, as they could possibly be out of school for those months (a total of 584 ambiguous person months). If a respondent missed more than six months within the 1996 school year, they were coded as not in school during the early months of 1997 until their month at first interview, with a separate flag indicating this imputation and also indicating that they may have actually been in school for some of those months (a total of 23 ambiguous person months). Taken together, I was able to reasonably impute the school enrollment between January 1997 and the date of the first interview for all but a handful of individuals. The ambiguous months prior to the first interview account for roughly 0.15% of the total person months involved in the study.

The top panel of Figure A.1 also suggests that school enrollment is seasonal, with low enrollment numbers during the summer months. In order to distinguish between school dropouts and those enrolled but on summer break, for the summer months any student that attended school during either April or May and September were coded as enrolled in school for the months of May, June, July, and August. The bottom panel in Figure A.1 displays the number of respondents enrolled in school from January 1997 until December 2004, based on these modifications to the NLSY97 event history files. The overall downward trend over time in the number of respondents enrolled in school is a function of both sample attrition, and the fact that as the respondents get older, more and more of them have completed their educations. The cyclical dips occur because most students complete their schooling in the spring when school terms end, and because students that have been out of school tend to enroll in school again in the fall when the school terms start again.

Educational Attainment. The NLSY97 contains a series of created variables that indicate the calendar month in which respondents receive a GED, High School Diploma, Vocational Training Certificate, Associate's Degree, or Bachelor's Degree. Using these variables, it is possible to create a set of dummy variables that indicate for each month a respondent contributes to the study whether an individual has received a particular degree. For example, one variable is coded 0 in the months before a respondent receives a high school diploma, but 1 in the month they receive this degree and every month after that. For any given month a respondent may have a high school diploma, an associate's degree, and a bachelor's degree, and therefore be given a score of 1 on each of these three variables. The effects of education are coded this way in order to measure the individual main effects for each type of educational degree. For example, the effect of obtaining a bachelor's degree is limited to the effect of the college degree above and beyond the effect of receiving a high school diploma. Whereas, if instead for each month a single variable indicating the highest degree obtained was utilized, it would be difficult to determine how much of the effect associated with a college degree was due to the college degree itself or due to the fact that most people with a college degree also have a high school diploma.

Family Level Independent Variables

Biological Mother's Age at First Birth. Age in year's that the respondent's biological mother had first given birth. If the mother's age at first birth was less than age 10 (13 respondents) or greater than age 50 (14 respondents), the mother's age at first birth was considered missing. 4,051 respondents had a valid response on this item. The unweighted mean for these individuals was 22.78 years. The 334 respondents with a missing value on this item, either because the data was missing or invalid, were given a value of 23. A flag was created to indicate those with an imputed value. This variable was then centered at 23, giving those with a missing value a score of zero, and those with a valid value a score between -13 and 25.

Biological Mother's Educational Attainment. During the first wave of data collection either a respondent's parent or a respondent herself reported the number of years of education completed by the respondent's biological mother. From this a series of dummy codes was created. Those with less than twelve years of education were coded as less than high school. Those with 12 years were coded as having a high school diploma. Those with between 1 and 3 years of college were coded as some college, while those that had completed four or more years of college were coded as having a college degree. A final category was created for those whose mother's educational attainment was unknown. For most of the analyses, the high school diploma is the reference category.

Family Structure at Age 6. During the first interview the respondent's parent provided the family structure of the respondent when they were six years old. From this information a dummy code was created indicating whether or not the respondent lived with both of her biological parents at age six. A valid response was collected from 3861 respondents, and 43.6% were living with two biological parents at the age of six. For the other 524 respondents, no parent completed the parent questionnaire. These respondents were given a score of 0 on this variable, and a flag was created to identify those whose parent's did not complete the parent questionnaire.

Cohabitation and Marriage. For each month from when a respondent turns 14 years old until the month of her last interview, the NLSY97 creates a variable that indicates whether she is residing with a cohabiting partner or with a spouse. These variables were used to create a set of marriage and cohabitation variables for each month that an individual contributed to the study. In months when a respondent was cohabiting with a romantic partner they were coded as 1 for the cohabitation variable and zero during all other months in which they were not cohabiting. In months when a respondent was residing with a married partner they were coded as 1 for the marriage variable and zero in months when they were not residing with a married partner. Respondents were assumed to be neither cohabiting nor married prior to age 14 and were therefore coded zero on both of these variables for months prior to the month of their fourteenth birthday.

Public Assistance. Beginning with the month that a respondent turns age fourteen through the month of her final interview, the NLSY97 creates a monthly variable that indicates whether she received various types of public assistance during that month. I created a monthly dummy code to indicate for each respondent the months in which they reported receiving either AFDC or

TANF funds. I created a second monthly dummy code to indicate whether or not a respondent received either food stamps or WIC in a give calendar month. In the months before a respondent turned age 14 it was assumed that she did not receive public assistance, though it is possible that her family of origin may have received these government transfers.

Sociocultural Independent Variables

Religious Affiliation. During the first interview respondents reported their current religious affiliation. From this two dummy codes were created indicating whether a respondent identified as Catholic (N = 1177; 26.8%) or as agnostic, atheist, or not having any religious affiliation (N = 487; 11.1%).

Social Structural Independent Variables

State of Residence. Using the state of residence from each interview and the information on migration collected at each wave of data, for each eligible person month that a respondent contributes to the analysis, it was possible to calculate their state of residence for that month. The FIPS variable indicates the State FIPS code for any given month. In addition, dummy codes were created for each state for each month with New York as the reference group. In some of the analysis the state fixed effects or dummy variables for a few states were not included in the analysis because either no one in the state had a pregnancy event and the state dummy code perfectly predicted failure (Idaho, Iowa, Maine, New Hampshire, West Virginia, and Wyoming) or because the state had only one pregnancy event and therefore perfectly predicted some pregnancy resolution outcome (Nebraska).

The state of residence is only recorded as of the date of first interview. Therefore, for the months between January 1997 and the month of the first interview, the respondents are assumed to be living in the same state that they reported living in during the month of the first interview. The average length of imputation in this fashion was 3.9 months per respondent with a median of 3 months. Though it is possible that some may have lived in a different state during this time frame, it is not likely that many experienced a move between states between January 1997 and the date of the first interview. As a means of comparison, between the 1997 and 1998 interviews less than 5% of the sample experienced a move between states or out of the country. However, the average length of time between the first two waves of data collection was 19.6 months compared to 3.9 months for the months before the first interview. Moreover, by the 1998 interview a much larger proportion of the sample was age 18 or over and therefore more mobile and more likely to leave for college than in 1997 (19.5% verses 0.3%). Taken together, this suggests that for the majority of the sample, using state of residence at the first interview to impute the state of residence for those months between January 1997 and the month of first interview represents a reasonable though imperfect imputation.

Like other variables in the NLSY97 the migration data was imperfect. 1,160 respondents experienced at least one interstate move and the majority of the data was valid. In a small minority of cases a respondent would report an out of state move but omit either the month or the

year of that move (N < 30). For the majority of these cases it was possible to impute the missing year based on the dates of the current and previous interviews and other moves that were reported during that wave of data collection. In the case of a missing month, the month was imputed as the midpoint of the most reasonable interval based on the dates of interviews and other moves. In another set of cases (approximately 50), the timing of an interstate move was recorded but the destination state was omitted. In most cases it was possible to calculate the destination state based on the states reported in subsequent within state moves, or the state of residence at the next interview. However, if a state of residence was unknown, it was given a FIPS code of zero. Also, within the NLSY97, due to a data collection error, respondents that experienced more than one move between the 1997 and 1998 waves were not asked to report the destination state for these higher order moves. In total, 44 respondents were missing the destination state for a higher order move reported at the 1998 interview; however, based on the information provided about other moves and the state of residence at the next interview, it was possible to deduce the destination state for 29 of these cases. The remaining 15 cases were coded as state of residence missing for these months. In addition, any respondents that resided out of the country were assigned a FIPS code of zero for those months. Because I use the state of residence variables to link individuals to the appropriate state policies, a total of 1667 eligible person months (0.44%) and 6 eligible pregnancies (0.19%) were deleted from the analyses due to either an unknown state of residence or a foreign residence.

Table A.1. Coding of the Race Variables.

Item responses (Number of respondents in parentheses):

Item 1	Item 2	Item 3	Race Variable
Hispanic (922)	White (2530)	Black (1166)	White (2127)
Non-Hispanic (3449)	Black or African American (1190)	Hispanic (924)	Black (1164)
	American Indian, Eskimo, or Aleut (33)	Mixed Race (Non-Hispanic) (43)	Hispanic (889)
	Asian or Pacific Islander (70)	Non-Black/Non-Hispanic (2252)	Mixed/Other (205)
	Something Else (517)		
Missing (14)	Missing (45)	Missing (0)	Missing (0)

Coding for Final Race Variable*:

If item 2 = White and	Item 3 = Hispanic	then race = Hispanic (403)
If item 2 = White and	Item 3 = Non-Black/Non-Hispanic	then race = White (2127)
If item 2 = Black or African American and	Item 3 =Black	then race = Black (1164)
If item 2 = Black or African American and	Item 3 = Mixed Race (Non-Hispanic)	then race = Mixed/Other (26)
If item 2 = American Indian, Eskimo, Aleut, Asian or Pacific Islander		then race = Mixed/Other (103)
If item 2 = Something Else and	Item 3 =Black	then race = Mixed/Other (2)
If item 2 = Something Else and	Item 3 = Hispanic	then race = Hispanic (453)
If item 2 = Something Else and	Item 3 = Mixed Race (Non-Hispanic)	then race = Mixed/Other (30)
If item 2 = Something Else and	Item 3 = Non-Black/Non-Hispanic	then race = Mixed/Other (32)
If item 2 = missing and	Item 3 = Mixed Race (Non-Hispanic)	then race = Mixed/Other (12)
If item 2 = missing and	Item 3 = Hispanic and item 1 = Hispanic	then race = Hispanic (33)

*No other combinations of these variables existed

Table A.2. Non-weighted Variable Means and Distributions.

Fixed-Time Variables (N= 4,385)

Year of Birth	N	Percent
1980	837	19.1%
1981	927	21.1%
1982	888	20.3%
1983	873	19.9%
1984	860	19.6%

Race	N	Percent
White/Caucasian	2,217	48.5%
African American	1,164	26.6%
Hispanic	889	20.3%
Mixed Race/Other	205	4.68%

Age at Menarche in Months	Mean	S.D.
	149.2	19.4

Age at First Sex in Years	Mean	S.D.
Those who have ever had sex (N = 3,748)	16.0	2.2
Those who have never had sex (N= 637)		

CAT-ASVAB Percentile Score	Mean	S.D.
Those with a valid score (N= 3,503)	46.3	28.6
Those with no score (N= 882)		

Religion	N	Percent
Catholic	1,177	26.8%
No Religion	487	11.1%
Other Religion	2,721	62.1%

Lived with both biological parents at age 6	N	Percent
Yes	1,684	38.4%
No	2,177	49.6%
No Parent Questionnaire completed	524	11.9%

Educational Attainment of Biological Mother	N	Percent
Less than High School	966	22.0%
High School/GED	1,467	33.5%
Some College	947	21.6%
Bachelor's Degree or More	669	15.3%
Unknown*	336	7.7%

Biological Mother's Age at First Birth in Years	Mean	S.D.
Those with a known age (N = 4,051)	22.8	4.81
Those with age unknown (N = 334)		

Table A.2. Non-weighted Variable Means and Distributions, Continued

Time Varying Variables for the Pregnancy Events (N = 3,181)*

Marital Status	N	Percent
Married	332	10.4%
Not married	2,849	89.6%

Cohabitation Status	N	Percent
Cohabiting	771	24.2%
Not cohabiting	2,410	75.8%

School Enrollment	N	Percent
Enrolled in school	1,267	39.8%
Not enrolled in school	1,914	60.2%

Employment	N	Percent
Currently employed	1,755	55.2%
Not currently employed	1,426	44.8%

AFDC Receipt	N	Percent
Receiving AFDC	135	4.2%
Not Receiving AFDC	3,046	95.8%

WIC Participation	N	Percent
Enrolled in WIC	728	22.9%
Not Enrolled in WIC	2,453	77.1%

Educational Attainment (not mutually exclusive)	N	Percent
No certificates	1,626	51.1%
GED	193	6.1%
High School diploma	1,362	42.8%
Bachelor's degree or more	9	0.3%

Previous Pregnancies	N	Percent
Zero	1,619	50.9%
One	876	27.5%
Two	400	12.6%
Three	168	5.3%
Four	66	2.1%
Five or more	52	1.6%

Previous Births	N	Percent
Zero	2,130	67.0%
One	793	24.9%
Two	213	6.7%
Three or more	45	1.4%

Table A.2. Non-weighted Variable Means and Distributions, Continued

Previous Abortions	N	Percent
Zero	2,823	88.8%
One	254	8.0%
Two	77	2.4%
Three or more	27	0.8%
Previous Stillbirths/Miscarriages	N	Percent
Zero	2,632	82.7%
One	379	11.9%
Two	105	3.3%
Three or more	65	2.0%
State Policies	N	Percent
Resides in lenient welfare/lenient abortion state	799	25.1%
Resides in lenient welfare/stringent abortion state	650	20.4%
Resides in stringent welfare/lenient abortion state	624	19.6%
Resides in stringent welfare/stringent abortion state	1,108	34.8%

*These variables are reported only for the second dataset, or only for individuals with a pregnancy with a known outcome between January 1997 and December 2004 are included. Moreover, an individual may contribute multiple scores if they experience multiple pregnancies. All scores are based on the month in which an individual becomes pregnant. Given that the other dataset was a person-month dataset, and that individuals contributed a varying numbers of person months, it did not seem informative or intuitive to provide the number of person months for each of the independent variables.

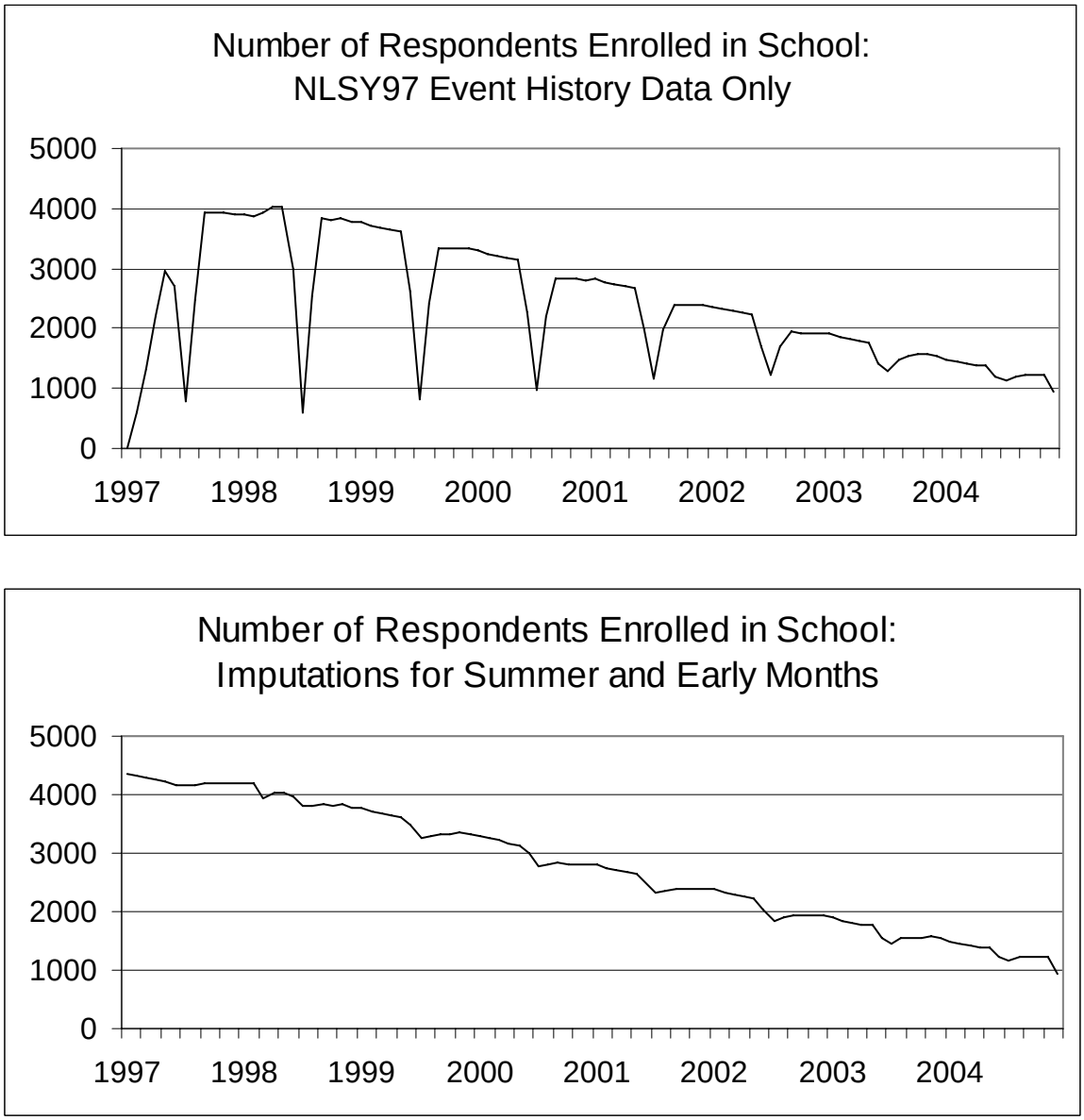


Figure A.1. Female NLSY97 Respondents Enrolled in School January 1997-December 2004.

BIBLIOGRAPHY

Aassve, A. (2003). The impact of economic resources on premarital childbearing and subsequent marriage among young American women. *Demography, 40,* 105-126.

Abma, J.C., Martinez, G.M., Mosher, W.D., & Dawson, B.S. (2004). Teenagers in the United States: Sexual activity, contraceptive use, and childbearing, 2002. Vital and Health Statistics 23(24). Washington, D.C.: National Center for Health Statistics.

Acs, G. (1996). The impact of welfare on young mothers' subsequent childbearing decisions. *The Journal of Human Resources, 31*(4), 898-915.

Acs, G., & Koball, H. (2003). TANF and the status of teen mothers under age 18. Washington, DC: The Urban Institute: Assessing the New Federalism Policy Brief A-62.

Administration for Children and Families (2008). TANF and AFDC Caseload Data. Available at: http://www.acf.hhs.gov/programs/ofa/data-reports/caseload/caseload_archive.html.

Allison, P.D. (1995). Survival Analysis Using SAS: A Practical Guide. Cary, NC: SAS Institute.

Argys, L.M., Averett, S.L., & Rees, D.I. (2000). Welfare generosity, pregnancies and abortions among unmarried AFDC recipients. *Journal of Population Economics, 13,* 569-594.

Arkes, J., & Klerman, J. (2005). Understanding the fertility-economy link for teenagers. Paper Presented at the 2005 Annual Meeting of the Population Association of America, Philadelphia, Pennsylvania, March 31 - April 2, 2005.

Bachrach, C.A., & Baldwin, W. (1991). Abortion underreporting. *Family Planning Perspectives, 23*(5), 233.

Bane, M.J., & Ellwood, D.T. (1994). *Welfare Realities: From Rhetoric to Reform*. Cambridge, MA: Harvard University Press.

Blank, R.M., George, C.C., & London, R.A. (1996). State abortion rates: The impact of policies, providers, politics, demographics, and economic environment. *Journal of Health Economics, 15*, 513-553.

Blank, R.M., (2001). What causes public assistance caseloads to grow? *The Journal of Human Resources, 36,* 86-118.

Blank, R.M., & Ruggles, P. (1996). When do women use Aid to Families with Dependent Children?: The dynamics of eligibility versus participation. *The Journal of Human Resources, 31,* 57-89.

Becker, G. (1991). *A Treatise on the Family*. Cambridge, MA: Harvard University Press.

Besharov, D.J. & Fowler, A.A. (1993). The end of welfare as we know it? *Public Interest, 111*, 95-108.

Bronfenbrenner, U., & Morris, P. A. (1998). The ecology of developmental processes. In R. M. Lerner (Ed.), *Theoretical models of human development* (5th ed., Vol. 1, pp. 993-1027). New York: Wiley.

Bronfenbrenner, U. (1979). *The Ecology of Human Development: Experiments by Nature and Design.* Cambridge, MA: Harvard University Press.

Casper, L.M. (1990). Does family interaction prevent adolescent pregnancy? Family Planning Perspectives, 22(3), 109-114.

Caudill, S.B., & Mixon, F.G. (2000). AFDC payments and illegitimacy ratios: A reappraisal of endogeneity using panel data. *American Journal of Economics and Sociology, 59(3), 451-462.*

Causes of poverty, with a focus on out of wedlock births: Hearings before the Subcommittee on Human Resources of the House Ways and Means Committee, 104th Cong., 2nd Sess. 140 (1996).

Center for Human Resources Research [CHRR], (2005). NLS Handbook. Available at: http://www.bls.gov/nls/handbook/nlshndbk.htm

Center for Human Resources Research [CHRR], (2007). NLSY97 User's Guide. Available at: http://www.nlsinfo.org/nlsy97/nlsdocs/nlsy97/maintoc.html

Cheffins, T. et al. (2000). The impact of maternal serum screening on the birth prevalence of Down's syndrome and the use of amniocentesis and chorionic villus sampling in South Australia. *BJOG: An International Journal of Obstetrics & Gynaecology, 107*(12), 1453-1459.

Cherlin, A.J., & Fomby, P. (2004) Welfare, work, and changes in mothers' living arrangements in low-income families. *Population Research and Policy Review, 23*: 543-565.

Clarke, G.R.G., & Strauss, R.P. (1998). Children as income-producing assets: The case of teen illegitimacy and government transfers. *Southern Economic Journal, 64*(4), 827-856.

Coley, R. L., & Chase-Lansdale, P. L. (1998). Adolescent pregnancy and parenthood: Recent evidence and future directions. *American Psychologist, 53*(2), 152-166.

Cook, P.J., Parnell, A.M., Moore, M.J., & Pagini, D. (1999). The effects of short-term variation in abortion funding on pregnancy outcomes. *Journal of Health Economics, 18*, 241–257.

Cooksey, E.C. (1990). Factors in the resolution of adolescent premarital pregnancies. Demography, 27(2), 207-218.

Collins, C., Alagiri, P., Summers, T., & Morin, S.F. (2002). *Abstinence only vs. comprehensive sex education: What are the arguments? What is the evidence.* San Francisco: AIDS Policy Research Center & Center for AIDS Prevention Studies, University of California.

Collins, M.E. (2000). Impact of welfare reform on teenage parent recipients: An analysis of two cohorts. *American Journal of Orthopsychiatry, 70*, 135-140.

Collins, M.E., Stevens, J.W., & Lane, T.S. (2000). Teenage parents and welfare reform: Findings from a survey of teenagers affected by living requirements. *Social Work, 45*, 327-337.

Corcoran, J. (1999). Ecological factors associated with adolescent pregnancy: A review of the literature. *Adolescence, 34*(135), 603-619.

Council of Economic Advisors (CEA). (1999). *The Effects of Welfare Policy and the Economic Expansion on Welfare Caseloads: An Update.* Executive Office of the President: Washington, D.C.

Coverdill, J.E. & Kraft, J.M. (1996). Enrollment, employment, and the risk and resolution of first premarital pregnancy. *Social Science Quarterly, 77*(1), 43-59.

Crosby, R.A. & Miller, K.S. (2002). Family influences on adolescent females' sexual health. *Handbook of Women's Sexual and Reproductive Health.* New York: Kluwer Academic/Plenum Publishers.

Crowder, K., & Teachman, J. (2004). Do residential conditions explain the relationship between living arrangements and adolescent behavior? *Journal of Marriage and Family, 66*, 721–738.

Currie, J., Nixon, L., & Cole, N. (1996). Restrictions on Medicaid funding of abortion: Effects on birth weight and pregnancy resolutions. *The Journal of Human Resources, 31*(1), 59-188.

Darroch, J.E., Landry, D.J., & Oslak, S. (1999). Age differences between sexual partners in the United States. *Family Planning Perspectives, 31*, 160-167.

DaVanzo, J., Hale, L., Razzaque, A., & Rahman, M. (2007). Effects of interpregnancy interval and outcome of the preceding pregnancy on pregnancy in Matlab, Bangladesh. *BJOG, 114*(9), 1079-1087.

De Jong, G.F., Graefe, D.R., Irving, S.K., & St. Pierre, T. (2006). Measuring State TANF policy variations and change after reform." *Social Science Quarterly 87*(4),755-781.

Driscoll, A.K., Hearn, G.K., Evans, J., Moore, K.A., Sugland, B.W., & Call, V. (1999). Nonmarital childbearing among adult women. *Journal of Marriage and the Family 61*(1), 178–87.

Duncan, G.J., & Hoffman, S.D. (1990). Welfare benefits, economic opportunities, and out-of-wedlock births among black teenage girls. *Demography, 27*(4), 519-535.

Dye, J.L., & Presser, H.B. (1999). The state bonus to reward a decrease in 'illegitimacy': Flawed methods and questionable effects. *Family Planning Perspectives, 31*(3), 142-147.

Dyer, W.T., & Fairlie, R.W. (2004). Do family caps reduce out-of-wedlock births? Evidence from Arkansas, Georgia, Indiana, New Jersey and Virginia. *Population Research and Policy Review, 23*, 441-473.

Edin, K. & Kefalas, M. (2005). *Promises I Can Keep: Why Poor Women Put Motherhood Before Marriage*. Los Angeles: University of California Press.

Ellertson, C. (1997). Mandatory parental involvement in minors' abortions: Effects of the laws in Minnesota, Missouri, and Indiana. *American Journal of Public Health, 87*(8), 1367-1374.

Ellis, B. J., Bates, J. E., Dodge, K. A., Fergusson, D. M., Horwood, L. J., Pettit, G. S., et al. (2003). Does father absence place daughters at special risk for early sexual activity and teenage pregnancy? *Child Development, 74*(3), 801-821.

Evans, A. (2001). The influence of significant others on Australian teenagers' decisions about pregnancy resolution. *Family Planning Perspectives, 33*(5), 224-230.

Executive Office of the President. (1995). *01/24/95: State of the union address-1995*. Washington D.C.: Author.

Fairlie, R.W., & London, R.A.(1997). The effect of incremental benefit levels on births to AFDC recipients. Journal of Policy Analysis and Management, 16(4), 575-597.

Fellowes, M.C., & Rowe, G. (2004). Politics and the new American welfare states. *American Journal of Political Science, 48*(2), 362-373.

Fender, L., McKernan, S.M., & Bernstein, J. (2002). Linking state TANF and related policies to outcomes: Preliminary typologies and analysis. Final Report prepared for the U.S. Department of Health and Human Services(DHS): Washington, D.C.: DHS.

Fergusson, D. M., & Woodward, L. J. (2000). Teenage pregnancy and female educational underachievement: A prospective study of a New Zealand birth cohort. *Journal of Marriage and Family, 62*(1), 147-161.

Fitchen, J.M. (1995). 'The single-parent family,' child poverty, and welfare reform. *Human Organization, 54(4)*, 355-362.

Fitzgerald, J.M., & Ribar, D.C. (2004). Transitions in welfare participation and female headship. *Population Research and Policy Review 23*: 641–670.

Forrest, J.D. (1993). Timing of reproductive life stages. *Obstetrics and Gynecology, 82*(1), 105-111.

Foster, E.M., & Hoffman, S.D. (2001). The young and the not quite so young: Age variation in the impact of AFDC benefits on nonmarital childbearing. In L.L. Wu and B. Wolfe (Eds.) *Out of Wedlock: Causes and Consequences of Nonmarital Childbearing.* New York: Russell Sage Foundation.

Foster, E.M., Jones. D., & Hoffman, S.D. (1998). Nonmarital childbearing in the post teenage years: The economic status of the women and their children. *Journal of Marriage and the Family, 60,* 163-175.

Franklin, D.L. (1988). Race, class, and adolescent pregnancy: An ecological analysis. *American Journal of Orthopsychiatry, 58,* 339-354.

Fu, H., Darroch, J.E., Henshaw, S.K., & Kolb, E. (1998). Measuring the extent of abortion underreporting in the 1995 National Survey of Family Growth. *Family Planning Perspectives, 30*(3), 28-133+138.

Furstenberg, F. (1991). As the pendulum swings: Teenage childbearing and social concern. *Family Relations, 40,* 127-138.

Gillmore, M. R., Morrison, D. M., Richey, C. A., Balassone, M. L., Gutierrez, L., & Farris, M. (1997). Effects of a skill-based intervention to encourage condom use among high risk heterosexually active adolescents. *AIDS Education & Prevention, 9*(Supplement A), 22-43.

Goode, W.J. (1997). Rational Choice Theory. *The American Sociologist, 28*(2), 22-41.

Graefe, D.R., DeJong, G.F., Sturgeon, S.W., & Van Eerden, J. (2006). Promoting or punishing traditional family formation? How and why states vary in post-welfare reform rules stringency. Paper presented at annual meeting of the Association of Public Policy and Management, Madison, WI, November.

Graefe, D.R., DeJong, G.F., Hall, M.S., Sturgeon, S.W., & Irving, S.K. (under review). "Carrots" and "sticks": Welfare policies affecting traditional family behaviors.

Gribble, J.N., Miller, H.G., Rogers, S.M., & Turner, C.F. (1999). Interview mode and measurement of sexual behaviors: Methodological issues. *The Journal of Sex Research, 36*(1), 16-24.

Guttmacher Institute (2008), State funding of abortion under Medicaid, *State Policies in Brief,* 2008. retrieved on March 8, 2008 from: http://www.guttmacher.org/statecenter/spibs/spib_SFAM.pdf

Haas-Wilson, D. (1993). The economic impact of state restrictions on abortion: Parental consent and notification laws and Medicaid funding restrictions. *Journal of Policy Analysis and Management, 12*(3), 498-511.

Haas-Wilson, D. (1997). Women's reproductive choices: The impact of Medicaid funding restrictions. *Family Planning Perspectives, 29*(5), 228-233.

Hao, L., Astone, N,M., & Cherlin, A.J. (2004). Adolescents' formal employment and school enrollment: Effects of state welfare policies. *Journal of Policy Analysis and Management, 23*(4): 697-721.

Harris, K.M. (1997). *Teen Mothers and the Revolving Welfare Door*. Philadelphia: Temple University Press.

Haskins, R. (2006). *Work Over Welfare: The Inside Story of the 1996 Welfare Reform Act.* Washington, D.C.: Brookings Institution Press.

Haskins, R. (2001). *Effects of welfare reform at four years*. In G. Duncan & P.L. Chase-Lansdale (Eds.), For Better and for Worse: Welfare Reform and the Well-Being of Children and Families. New York: Russell Sage Foundation.

Haveman, R., Wolfe, B., Wilson, K., & Peterson, E. (1997). Do teens make rational choices? The case of teen nonmarital childbearing. Institute for Research on Poverty, Discussion Paper no. 1137-97. Available at: http://www.ssc.wisc.edu/irp/

Hechter, M., & Kanazawa, S. (1997). Sociological rational choice theory. *Annual Review of Sociology, 23*, 191-214.

Heckathorn, D.D. (1997). Overview: The paradoxical relationship between sociology and rational choice. *The American Sociologist, 28*(2), 6-15.

Henshaw, S.K. & Finer, L.B. (2003). The accessibility of abortion services in the United States, 2001. *Perspectives on Sexual and Reproductive Health, 35*(1), 16-24.

Henshaw, S.K. & Kost, K. (1996). Abortion patients in 1994-1995: Characteristics and contraceptive use. *Family Planning Perspectives, 28*(4), 140-147+158.

Henshaw, S.K. & Silverman, J. (1988). The characteristics and prior contraceptive use of U.S. abortion patients. *Family Planning Perspectives, 20*(4), 158-159+162-168.

Hagen, J.L, & Davis, L.V. (1994). Women on welfare talk about reform. *Public Welfare, 52 (2),* 30-40.

Hao, L., & Cherlin, A.J. (2004). Welfare reform and teenage pregnancy, childbirth, and school dropout. *Journal of Marriage and Family, 66*, 179-194.

Hicks, A.M., & Swank, D.H. (1992). Politics, institutions, and welfare spending in industrialized democracies, 1960-82. *American Political Science Review,* 86, 658-675.

Hill, K.Q., Leighley, J.E., & Hinton-Andersson, A. (1995). Lower-class mobilization and policy linkage in the U.S. States. *American Journal of Political Science, 3*9, 75-86.

Hoffman, S.D. (1998). Teenage childbearing is not so bad after all…or is it? A review of the new literature. *Family Planning Perspectives, 30*, 236-239, 243.

Hoffman, S.D., & Foster, E.M. (2000). AFDC Benefits and nonmarital births to young women. *The Journal of Human Resources, 35*, 376-391.

Hogan, D. P., & Kitagawa, E. M. (1985). The impact of social status, family structure, and heighborhood on the fertility of black adolescents. *The American Journal of Sociology, 90*(4), 825-855.

Hogan, D. P., Sun, R., & Cornwell, G. T. (2000). Sexual and fertility behaviors of American females aged 15-19 years: 1985, 1990, and 1995. *American Journal of Public Health, 90*(9), 1421-1425.

Horvath-Rose, A.E., & Peters, H.E. (2001). Welfare waivers and nonmarital childbearing. In G. Duncan & P.L. Chase-Lansdale (Eds.), *For Better and for Worse: Welfare Reform and the Well-Being of Children and Families*. New York: Russell Sage Foundation.

House Committee on Ways and Means (2004). *Background Material and Data on Programs Within the Jurisdiction of the House Committee on Ways and Means (Greenbook).* Washington D.C.: Author.

Howard, C. (1999). *The Hidden Welfare State: Tax Expenditures and Social Policy in the United States*. Princeton, NJ: Princeton University Press.

Jagannathan, R. (2001). Relying on surveys to understand abortion behavior: Some cautionary evidence. *American Journal of Public Health, 91*(11), 1825-1831.

Jagannathan, R., & Camasso, M.J. (2003). Family cap and nonmarital fertility: The racial conditioning of policy effects. *Journal of Marriage and the Family, 65*, 52-71.

Jones, R.K., Darroch, J.E., & Henshaw, S.K. (2002). Patterns in the socioeconomic characteristics of women obtaining abortions in 2000-2001. *Perspectives on Sexual and Reproductive Health, 34*(5), 226-235.

Jones, E.F., & Forrest, J.D. (1992). Underreporting of abortion in surveys of U.S. women: 1976 to 1988. *Demography, 29*(1), 113-126.

Joyce, T. (1988). The social and economic correlates of pregnancy resolution among adolescents in New York City, by race and ethnicity: A multivariate analysis. American Journal of Public Health, 78(6), 626-631.

Joyce, T., Kaestner, R., & Korenman, S. (2003). Welfare reform and non-marital fertility in the 1990s: Evidence from birth records. *Advances in Economic Analysis & Policy, 3*(1), 1-34.

Joyce, T., Kaestner, R., Korenman, S., & Henshaw, S. (2004). Family cap provisions and changes in births and abortions. *Population and Research Policy Review, 23*, 475-511.

Kaestner, R (1998). Drug use, culture and welfare incentives: Correlates of family structure and out-of-wedlock birth. *Eastern Economic Journal, 24*, 395-416.

Kane, T.J., & Staiger, D. (1996). Teen motherhood and abortion access. *The Quarterly Journal of Economics, 111*(2), 467-506.

Kallen, B. (1988). *Epidemiology of Human Reproduction.* Boca Raton, FL: CRC Press.

Kearney, M.S. (2002). Is there an effect of incremental welfare benefits on fertility behavior? A look at the family cap. NBER Working Paper 9093. Available at: http://www.nber.org/papers/w9093

King, R.H., Myers, S.C., & Byrne, D.M. (1992). The demand for abortion by unmarried teenagers: Economic factors, age, ethnicity and religiosity matter. *American Journal of Economics and Sociology, 51(*2), 223-235.

King, G. & Zeng, L. (2001). Logistic regression in rare events data. *Political Analysis 9*(2), 137-163.

Kirby D. (2001). Emerging Answers: Research Findings on Programs to Reduce Teen Pregnancy. Washington, DC: National Campaign to Prevent Teen Pregnancy.

Kirby, D., Coyle, K., & Gould, J.B. (2001). Manifestations of poverty and birthrates among young teenagers in California zip code areas. *Family Planning Perspectives*, 33(2), 63-69.

Kirby, D., Lepore, G., & Ryan, J. (Eds.). (2005). *Factors Affecting Teen Sexual Behavior, Pregnancy, Childbearing And Sexually Transmitted Disease: Which Are Important? Which Can You Change?* Washington, D.C.: National Campaign to Prevent Teen Pregnancy.

Klawitter, M., Plotnick, R.D., & Edwards, M.E. (2000). Determinants of initial entry onto welfare by young women. *Journal of Policy Analysis and Management, 19*(4): 527-546.

Klerman, J.A. (1998). Welfare reform and abortion. In R.A. Moffitt (Ed.), *Welfare, the Family, and Reproductive Behavior: Research Perspectives* (pp. 98-133). Washington, D.C.: National Academy Press.

Klerman, J.A. (2005). Family structure. Chapter 8 in J. Grogger and L.A. Karoly [Eds.]. Welfare Reform: Effects of a Decade of Change. Cambridge, MA: Harvard University Press.

Korenman, S., Joyce, T., Kaestner, R., & Walper, J. (2006). What did the "illegitimacy bonus" reward? *Topics in Economic Analysis & Policy, 6(1),* 1-34.

Lee, R. (2001). The decline of formal and aggregate analysis: Demography abandons it's core. Paper presented at the Annual Meeting of the Population Association of America. Available at: http://www.ceda.berkeley.edu/papers/rlee/FormalDemog.pdf

Leibowitz, A., Eisen, M., & Chow, W.K. (1986). An economic model of teenage pregnancy decision-making. Demography, 23(1), 67-77.

Levine, P.B., & Staiger, D. (2002). Abortion as insurance. NBER Working Paper 8813, Available at: http://www.nber.org/papers/w8813

Levine, P.B. (2002). The impact of social policy and economic activity throughout the fertility decision tree. NBER working Paper 9021. Available at: http://www.nber.org/papers/w9021.

Levine, P.B. (2003). Parental involvement laws and fertility behavior. *Journal of Health Economics, 22*, 861–878.

Levine, P.B., Trainor, A.B., & Zimmerman, D.J. (1995). The effect of Medicaid abortion funding restrictions on abortions, pregnancies, and births. NBER Working Paper 5066, Available at: http://www.nber.org/papers/w5066.

Lichter, D.T., Graefe, D.R., & Brown, B.J. (2003). Is marriage a panacea? Union formation among economically disadvantaged unwed mothers. *Social Problems*, 50: 60-86.

Lichter, D.T. , McLaughlin, D.K., & Ribar, D.C. (1998). State abortion policy, geographic access to abortion providers and changing family formation. *Family Planning Perspectives, 30*(6), 281-287.

Lichter, D.T. , McLaughlin, D.K., & Ribar, D.C. (1997). Welfare and the rise in female-headed families. *American Journal of Sociology, 103*(1), 112-143.

Lindberg, L.D., Sonenstein, F.L., Ku, L., & Martinez, G. (1997). Age differences between minors who give birth and their adult partners. *Family Planning Perspectives, 29*, 61-66.

Long, J.S. (1997). *Regression Models for Categorical and Limited Dependent Variables*. Thousand Oaks, CA: Sage.

Lopoo, L.M. (2005). Maternal employment and teenage childbearing: Evidence from the PSID. *Journal of Policy Analysis and Management, 24* (1): 23-46.

Lundberg, S. & Plotnick, R.D. (1990). Effects of state welfare, abortion and family planning policies on premarital childbearing among white adolescents. *Family Planning Perspectives, 22*(6), 246-251+275.

Lundberg, S. & Plotnick, R.D. (1995). Adolescent premarital childbearing: Do economic incentives matter? *Journal of Labor Economics, 13*(2), 177-200.

Manlove, J. (1998). The influence of high school dropout and school disengagement on the risk of school-age pregnancy. *Journal of Research on Adolescence, 8*, 187–220.

Manlove, J., Terry, E., Gitelson, L., Papillo, A. R., & Russell, S. (2000). Explaining demographic trends in teenage fertility, 1980-1995. *Family Planning Perspectives, 32*(4), 166-175.

Manlove, J., Mariner, C., & Papillo, A.R. (2000). Subsequent fertility among teen mothers: Longitudinal analyses of recent national data. Journal of Marriage and Family, 62(2), 430-448.

Manlove, J., Mariner, C., & Romano A. (1997) Postponing Second Teen Births in the 1990s: Longitudinal Analyses of National Data. Washington D.C.: Child Trends.

Martin, J.A., et al. (2007). Births: Final data for 2005. *National Vital Statistics Reports; vol 56 no 6.* Hyattsville, MD: National Center for Health Statistics.

Martin, J.A., et al. (2006). Births: Final data for 2004. *National Vital Statistics Reports; vol 55 no 1*. Hyattsville, MD: National Center for Health Statistics.

Matthews, S., Ribar, D., & Wilhelm, M. (1997). The effects of economic conditions and access to reproductive health services on state abortion rates and birthrates. *Family Planning Perspectives, 29*(2), pp. 52-60.

Maynard, R. (1995). Teenage childbearing and welfare reform: Lessons from a decade of demonstration and evaluation research. *Children and Youth Services Review, 17*, 309-332.

McKernan, S.M., Bernstein, J., & Fender, L. (2005). Taming the beast: Categorizing state welfare policies: A typology of welfare policies affecting recipient job entry. *Journal of Policy Analysis and Management, 24*(2), 443-460.

McKernan, S., & Ratcliffe, C. (2005). Events that trigger poverty entries and exits. *Social Science Quarterly, 86*(s1), 1146-1169.

McLanahan, S. (1994). The consequences of single motherhood. *The American Prospect*, 18.

McLanahan, S.S. (2004a). Fragile families and the marriage agenda. *Fragile Families Working Paper 2003-16-FF*.

McLanahan, S.S. (2004b). Diverging destinies: How children are faring under the second demographic transition. *Demography, 41*, 607-627.

Medoff, M.H. (2002). The determinants and impact of state abortion restrictions. *American Journal of Economics and Sociology, 61*(2), 481-493.

Meier,K.J., Haider-Markel, D.P., Stanislawski, A.J., & Mcfarlane, D.R. (1996). The impact of state-level restrictions on abortion. *Demography, 33*(3), 307-312.

Mensch, B., & Kandel, D.B. (1992). Drug use as a risk factor for premarital teen pregnancy and abortion in a national sample of young white women. *Demography, 29*(3), 409-429.

Meschke, L.L., Bartholomae, S., & Zentall, S.R. (2000). Adolescent sexuality and parent-adolescent processes: Promoting healthy teen choices. *Family Relations, 49*(2), 143-154.

Meyers, M.K., Gornick, J.C., & Peck, L.R. (2001). Packaging support for low income familes: Policy variation across the United States. *Journal of Policy Analysis and Management, 20*(3), 457-483.

Moffit, R. (1992). Incentive effects for the U.S. welfare system: A review. *Journal of Economic Literature, 30*(1), 1-61.

Moffit, R.A. (2001) Welfare benefits and female headship in U.S. time series. In L.L. Wu and B. Wolfe (Eds.) *Out of Wedlock: Causes and Consequences of Nonmarital Childbearing.* New York: Russell Sage Foundation.

Moore, K. A., & Chase-Lansdale, P. L. (2001). Sexual intercourse and pregnancy among African-American girls in high-poverty neighborhoods: The role of family and perceived community environment. *Journal of Marriage and Family, 63*(4), 1146-1157.

Morgan, S.P., & Parnell, A.M. (2002). Effects on pregnancy outcomes of changes in the North Carolina State Abortion Fund. Population Research and Policy Review, 21(4), 319-338.

Murray, C. (1984). *Losing Ground.* New York: Basic Books.

Murry, V.M. (1995). An ecological analysis of pregnancy resolution decisions among African Americans and Hispanic adolescent females. *Youth & Society, 26*(3), 325-350.

National Abortion Rights Action League (NARAL), (1996-2006). *Who Decides? The Status of Women's reproductive Rights in America*. Washington, D.C.: Author.

National Center for Health Statistics (2007). *Health, United States, 2007: With Chartbook on Trends in the Health of Americans*: Hyattsville, MD: Author.

National Research Council. (1987). *Risking the future: Adolescent sexuality, pregnancy, and childbearing.* Haynes, C.D. (Ed.). Washington D.C.: National Academy Press.

New, M.J. (2007). *Analyzing the Effects of State Legislation on the Incidence of Abortion Among Minors*. Washington, D.C.: The Heritage Foundation center for Data Analysis.

New, M.J. (2008). *Pro-Life Politicians Have Made a Difference, Pro-Life Laws Work*. Princeton, N.J.: The Witherspoon Institute.

Norrander, B., & Wilcox, C. (1999). Public opinion and policy making in the states: The case of post-Roe abortion policy. *Policy Studies Journal, 27*(4), 707-722.

Offner, P. (2003). Teen parents and welfare reform. Draft report prepared for the Smith-Richardson Foundation. Washington, D.C.: The Urban Institute.

Ohsfeldt, R.L., & Gohmann, S.F. (1994). Do parental involvement laws reduce adolescent abortion rates? *Contemporary Economic Policy, 12*(2). 65-76.

Orr, L. (1976). Income transfers as a public good: An application to AFDC. *American Economic Review, 66,* 359-371.

Perlis, T.E., Des Jarlais, D.C., Friedman, S.R., Arasteh, K., & Turner, C.F. (2004). Audio-computerized self-interviewing versus face-to-face interviewing for research data collection at drug abuse treatment programs. *Addiction, 99,* 885-896.

Peterson, P.E., & Rom, M. (1989). American federalism, welfare policy, and residential choices. *The American Political Science Review, 83,* 711-728.

Plotnick, R.D. (1990).Welfare and out-of-wedlock childbearing: Evidence from the 1980s. *Journal of Marriage and the Family, 52*(3), 735-746.

Plotnick, R.D. (1992). The effects of attitudes on teenage premarital pregnancy and its resolution. *American Sociological Review, 57*(6), 800-811.

Plotnick, R.D., & Winters, R.D. (1985). A politico-economic theory of income redistribution. *The American Political Science Review, 79*, 458-473.

Proctor, B.P., & Dalaker, J. (2003). Poverty in the United States: 2002. *U.S. Census Bureau, Current Population Reports, P60-222*. Washington D.C.: U.S. Government Printing Office.

Rector, R.E., & Youssef, S.E. (1999). The determinants of welfare caseload decline. Heritage Foundation Center For Data Analysis report # 99-04. Available online at: http://www.heritage.org/Research/Welfare/upload/cda_9904.pdf

Ricard, J. (1995). The factors of genuine welfare reform. *Origins, 24*(34), 564-566.

Roe v. Wade, 410 U.S. 113 (1973).

Rom, M.C. (1999). Transforming state health and welfare programs." In V. Gray, R. L. Hansen, and H. Jacob [Eds.] *Politics in the American States, A Comparative Analysis*. Washington, DC: CQ Press.

Rosenzweig, M.R. (1999). Welfare, marital prospects, and nonmarital childbearing. *Journal of Political Economy, 107*, S3-S32.

Sabia, J.J. (2008). Blacks and the family cap: Abortions, pregnancies, and spillovers. *Journal of Population Economics, 21*, 111-134.

Sawhill, I. (2000) Welfare reform and reducing teen pregnancy. *The Public Interest*, Winter, 2000.

Sen, B. (2006). Frequency of sexual activity among unmarried adolescent girls: Do state policies pertaining to abortion access matter? *Eastern Economic Journal, 32*(2), 313-330.

Singer, E., Antonucci, T., & Van Hoewyk, J. (2004). Racial and ethnic variations in knowledge and attitudes about genetic testing. *Genetic Testing, 8*(1), 31-43.

Singh, S., & Darroch, J.E. (2000) Adolescent pregnancy and childbearing: Levels and trends in developed countries. *Family Planning Perspectives, 32*, 14-23.

Snijders, T.A.B., & Bosker, R.J. (1999). Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling. Thousand Oaks, CA: Sage.

Sonfield, A. & Gold, R.B. (2005). Public Funding for Contraceptive, Sterilization and Abortion Services, FY 1980-2001. Washington, D.C.: Guttmacher Institute.

Soss, J., Schram, S., Vartanian, T., & O'Brien, E. (2001). Setting the terms of relief: Political explanations for state policy choices in the devolution revolution. *American Journal of Political Science. 45*(2): 378-95.

South, S.J. & Baumer, E.P. (2001). Community effects on the resolution of adolescent premarital pregnancy. *Journal of Family Issues, 22*(8), 1025-1043.

StataCorp. (2005). *Stata Statistical Software: Release 9*. College Station, TX: StataCorp LP.

Stevens, L.K., Register, C.A., & Sessions, D.N. (1992). The abortion decision: A qualitative choice approach. *Social Indicators Research, 27*(4), 327-344.

Strauss, L.T., et al. (2007). Abortion surveillance, United States, 2004. *Morbidity and Mortality Weekly Report, vol. 56(SS09).* Centers for Disease Control, National Center for Chronic Disease Prevention and Health Promotion, Division of Reproductive Health.

Strickland, R.A., & Whicker, L.W. (1992). Political and socioeconomic indicators of state restrictiveness toward abortion. *Policy Studies Journal, 20*(4), 598-617.

Sturgeon, S.W. (2005a). The Effect of PRWORA in Pennsylvania: Using Random Effects Models to Examine Rural and Urban Differences. Unpublished master's thesis, The Pennsylvania State University.

Sturgeon, S.W. (2005b). The Relationship between Teen Birth Rates and Welfare Receipt in Pennsylvania from 1990 to 2002. Session presented at the 2005 Pennsylvania Teen Pregnancy Prevention Conference, State College, PA, October.

Sturgeon, S.W. (2008). *Familyfacts.org Special Report No.1: The Relationship Between Family Structure and Adolescent Sexual Activity*. Washington, D.C.: The Heritage Foundation.

Thomas, A., & Sawhill, I. (2002). For richer or for poorer: Marriage as an antipoverty strategy. *Journal of Policy Analysis and Management, 21*, 587-599.

Tilly, C. (1997). James S. Coleman as a guide to social research. *The American Sociologist, 28*(2), 82-87.

Tomal, A. (1999). Parental involvement laws and minor and non-minor teen abortion and birth rates. *Journal of Family and Economic Issues, 20*(2), pg. 149-162.

Tomal, A. (2001). The effect of religious membership on teen abortion rates. *Journal of Youth and Adolescence, 30*(1), 103-116.

Udry, J.R., Kovenock, J., & Morris, N.M. (1996). Early predictors of nonmarital first pregnancy and abortion. *Family Planning Perspectives, 28*(3), 113-116.

Upchurch, D.M., Lillard, L.A., & Panis, C.W.A. (2002). Nonmarital childbearing: Influences of education, marriage, and fertility. *Demography, 39*, 311-329.

Urban Institute. (2007). Assessing the New Federalism State Database. Washington, DC: Urban Institute. Available at hhttp://www.urban.orgi.

U.S. General Accounting Office (USGAO). (1994). Families on Welfare: Teenage mothers least likely to become self-sufficient. GAO/HEHS report 94-115. Washington, D.C.: GAO.

Ventura, S.J., Abma, J.C., Mosher, W.D., & Henshaw, S.K. (2008). Estimated pregnancy rates by outcome for the United States, 1990–2004. *National Vital Statistics Reports, 56* (15). Hyattsville, MD.: National Center for Health Statistics.

Ventura, S.J., Abma, J.C., Mosher, W.D., & Henshaw, S.K. (2006). Recent trends in teenage pregnancy in the United States, 1990-2002. *National Vital Statistics Reports.* Hyattsville, MD: National Center for Health Statistics.

Ventura, S.J. & Bachrach, C.A. (2000). Nonmarital childbearing in the United States, 1940-1999. *National Vital Statistics Reports, 48* (16). Hyattsville, MD.: National Center for Health Statistics.

Ventura, S.J., Matthews, T.J., & Hamilton, B.E. (2001). Births to teenagers in the United States, 1940-2000. *National Vital Statistics Reports, 49* (10). Hyattsville, MD.: National Center for Health Statistics.

Ventura, S.J., Mosher, W.D., Curtin, S.C., Abma, J.C., & Henshaw, S. (2000). Trends in pregnancies and pregnancy rates by outcome: Estimates for the United States, 1976–96. *Vital and Health Statistics, 21*(56). Hyattsville, MD.: National Center for Health Statistics.

Vittinghoff, E. & McCulloch, C.E. (2007). Relaxing the rule of ten events per variable in logistic and cox regression. *American Journal of Epidemiology, 165*(6), 710-718.

Volden, C. (2006). Experimenting with welfare Reform: Emulating success, cutting costs, or racing to the bottom? *Social Science Quarterly, 87*(4), 791-797.

'Welfare Queen' becomes issue in Reagan campaign, (1976, February 15). *The New York Times*, p. 51.

Wellings, K., et al. (2006). Sexual behaviour in context: A global perspective. *The Lancet, 368*, 1706-1728.

Wilcox, B.L., Robbennolt, J.K., O'Keeffe, J.E., & Pynchon, M.E. (1996). Teen nonmarital childbearing and welfare: The gap between research and political discourse. *Journal of Social Issues, 52*, (3), 71-90.

Wolfe, B., Wilson, K., Haveman, R. (2001). The role of economic incentives in teenage nonmarital childbearing choices. *Journal of Public Economics*, 81, 473–511.

Wright, G.C. (1977). Racism and welfare policy in America. *Social Science Quarterly, 57*, 718-730.

Wrong, D.H. (1997). Is rational choice humanity's most distinctive trait? *The American Sociologist, 28*(2), 73-81.

Wu, L. L., & Thomson, E. (2001). Race differences in family experience and early sexual initiation: Dynamic models of family structure and family change. *Journal of Marriage and Family, 63*(3), 682-696.

Yamaguchi, K. & Kandel, D. (1987). Drug use and other determinants of premarital pregnancy and its outcome: A dynamic analysis of competing life events. *Journal of Marriage and the Family, 49*(2), 257-270.

Zavodny, M. (2001). The Effect of partner's characteristics on teenage pregnancy and its resolution. *Family Planning Perspectives, 33*(5), 192-199+205.

Zylan, Y., & Soule, S.A. (2000). Ending welfare as we know it (again): Welfare state retrenchment, 1989-1995. *Social Forces, 79*, 623-652.

Vita Samuel W. Sturgeon

Education

Ph.D., Human Development and Family Studies and Demography — May 2009
The Pennsylvania State University, University Park, PA

M.S., Human Development and Family Studies and Demography — Aug. 2005
The Pennsylvania State University, University Park, PA

B.S., Psychology — Aug. 2002
Brigham Young University, Provo, UT

Research Experience

Research Analyst, Research and Information Division, The Church of Jesus Christ of Latter-day Saints — Sept. 2007-present

Research Assistant, Population Research Institute, PSU — May 2005-Aug. 2007

Social Science Fellow, Domestic Policy Studies Center, The Heritage Foundation — June 2006-Aug. 2006

Research Assistant, Human Development and Family Studies, PSU — Aug. 2002-Dec. 2005

Research Assistant, Prevention Research Center, PSU — Jan. 2003-Dec.2003

Research Assistant, Family Studies Center, BYU — Jan. 2002-Aug. 2002

Research Assistant, Women's Research Institute, BYU — Sept. 2000-April 2001

Selected Publications/Conference Presentations

Sturgeon, S.W. (2008). *Familyfacts.org Special Report No.1: The Relationship Between Family Structure and Adolescent Sexual Activity*. Washington, D.C.: The Heritage Foundation.

DeJong, G.F., Graefe, D.R., Van Eerden, J., Hall, M., & Sturgeon, S.W. (2008). Immigrant's TANF Eligibility, 1996-2003: What Explains the New Across-State Inequalities? *International Migration Review, 42*(1).

Eggebeen, D.J. & Sturgeon, S.W. (2006). Demography of the baby boomers. In *The Baby Boomers Grow Up: Contemporary Perspectives on Midlife*. S.K Whitbourne and S.L Willis (Eds.). Mahwah, NJ: Lawrence Erlbaum.

Sturgeon, S.W. (2006). Resetting the Caseload Reduction Bar: How Current Characteristics of the Welfare Population May Limit Success. Paper presented at the annual meeting of the Association of Public Policy and Management, Madison, Wisconsin, November.

DeJong, G.F., Graefe, D.R., Sturgeon, S.W., & Van Eerden, J. (2006). Promoting or Punishing Traditional Family Formation? How and Why States Vary in Post-Welfare Reform Rules Stringency. Paper presented at the annual meeting of the Association of Public Policy and Management, Madison, Wisconsin, November.

Sturgeon, S.W. (2005). The Relationship between Teen Birth Rates and Welfare Receipt in Pennsylvania from 1990 to 2002. Session presented at the 2005 Pennsylvania Teen Pregnancy Prevention Conference, State College, PA, October.

Sturgeon, S.W. (2005). The Effect of PRWORA on Welfare Caseloads in Pennsylvania: Fixed Effects Versus Random Effects Models. Poster Presented at the annual meeting of the Population Association of America in Philadelphia, April.