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Jean Knab, Princeton University

Sara McLanahan, Princeton University

Irv Garfinkel, Columbia University

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Jean Knab

Princeton University

Irv Garfinkel

Columbia University

Sara McLanahan

Princeton University

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Abstract: Previous research indicates that welfare reform policies – work requirements, sanctions, and child support enforcement – had negative consequences for mothers’ health insurance coverage and use of health care service, but there is very little evidence that these policies affected maternal health. This paper examines the effects of post-reform welfare and child support policies on maternal health and health behavior using data from the Fragile Families and Child Wellbeing Study. Results suggest that increases in welfare generosity are associated with increases in mental health at low levels of generosity and decreases in mental health at high levels of generosity. The effects on smoking, however, go in the opposite direction. Increases in the stringency of child support enforcement are associated with decreases in mental health. That generous welfare and stringent child support enforcement may negatively affect mother’s mental health is surprising and worrisome.

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In 1996 the U.S. Congress passed the Personal Responsibility and Work Opportunities Reconciliation Act (PRWORA), substantially reducing a family's rights to income support. PRWORA removed the entitlement to government-provided cash assistance and increased states' incentives to reduce welfare caseloads. At the same time it increased private responsibilities by encouraging greater work effort from mothers and more child support payments from non-resident fathers.

The PRWORA provisions raised concerns within the medical community and among others interested in the health and wellbeing of at-risk families. The changes to cash welfare and child support policies had potential direct and indirect consequences for women's health. Most directly, by removing the entitlement to welfare, many advocates feared that poor women would lose their health insurance coverage. While PRWORA included a provision to hold Medicaid eligibility constant, the administrative barriers to staff and states and the confusing new rules suggested that many eligible women might lose coverage.

Less direct effects of welfare reform on maternal health were also of concern. Advocates feared that increased work requirements and stronger child support enforcement might increase maternal stress, leading to increases in mental health problems. They also expressed concern that stronger child support enforcement might expose mothers to more violence from fathers while stricter welfare requirements might make it harder for mothers to escape violent partners (Kaplan 1997). Finally, advocates feared that substance abusers and women with mental health problems would be disproportionately harmed by the new policies (APA 2001; Metsch and Pollack 2005).

Research to date has generally focused on the impact of welfare reform on the health insurance coverage and health care utilization of low-income women. Some studies have found that more restrictive welfare policies are associated with small reductions in health insurance and indications of less health care utilization (Bitler and Gelbach 2005; Holl, Slack and Stevens 2005; Kaestner and Kaushal 2003).

There is little evidence, however, that stricter welfare policies have had a negative impact on mothers' health. Indeed, one study found that reductions in welfare caseloads were associated with improvements in one health behavior, specifically reductions in binge drinking (Kaestner and Tarlov 2006).

This chapter replicates and extends previous work on the impact of welfare policies on maternal health in several ways. First, we examine a broader range of outcomes than has been covered in previous studies. Second we use data from a recent longitudinal study of unmarried parents and their child, the Fragile Families and Child Wellbeing Study. To date, most of the research on the effects of welfare reform on maternal health has either used data from the Behavioral Risk Factor Surveillance System, a national data set, or data from one or a handful of states. Thus trying to replicate some of the previous analyses using a different national data set is a useful exercise. A third extension is that no previous study has looked at the effects of child support enforcement on health outcomes. Since stronger child support enforcement was part of welfare reform and since these two sets of policies may have complementary or offsetting effects on maternal health, it makes sense to examine them together. Finally, whereas all of the studies previously cited look at the effects of welfare *reform* on maternal health, we examine the effects of post-PRWORA policies to determine if policies that encourage high levels of welfare participation are associated with poorer maternal health and health behavior.

The Fragile Families and Child Wellbeing data have a number of strengths that make these data attractive for studying the effects of welfare and child support policies on maternal health. The study, which over-samples non-marital births and asks mothers a large array of questions about their health and health behaviors, provides extensive information on the population of women who are most likely to be affected by welfare and child support policies. Moreover, because the study is longitudinal, we are able to examine the association between changes in welfare use and child support receipt and changes in mothers' health (fixed effects models). Finally, the cities in the Fragile Families sample were drawn via a stratified random sample that was designed to capture the extremes of welfare and child support policies and labor market conditions. See Reichman et al (2001) for more detail on the study design. Thus, differences in state policies that affect the likelihood that a mother is on welfare can be used to help

determine the effects of welfare and child support policies on maternal health by using them as instruments to predict welfare and child support receipt.

The Fragile Families data also have limitations. Although the fixed effects models are an improvement over standard OLS models, they do not resolve all of the causality problems that arise from using observational data. In addition, the state policies that we use to identify the effects of welfare policies are measured only once, and therefore we cannot rule out the possibility that they are a proxy for some other variable that varies across states and affects maternal health.

BACKGROUND

An emerging body of research examines the link between the welfare reforms of the late 1990s and maternal and child health. Both Bitler and Gelbach (2005) and Kaestner and Tarlov (2006) provide thorough reviews of how welfare reform, primarily via transitions to employment, may impact maternal health and the empirical evidence to date on this topic. We take a broader perspective on the role of welfare and child support policies; specifically, we ask how the generosity and stringency of these policies, in general, may impact maternal health and wellbeing. In this regard, we view welfare reform as a set of policies that made public support less generous and private support more mandatory.

What does theory tell us about the potential effects of welfare and child support policies on maternal health and health behavior? With respect to welfare policies, theory is ambiguous and suggests two potential causal pathways through which welfare might affect health. First, Aid to Mothers with Dependent Children, or ‘welfare,’ was designed to aid mothers in dire circumstances, and for this reason we would expect generous welfare policies to improve mothers’ health, at least in the short run. Second, because welfare benefits are highly income-tested, they discourage work, which may lead to economic dependence in the long run. For this reason we might expect more generous welfare policies to reduce mothers’ health and increase negative health behavior. Finally, estimating the correct effect of welfare policies on maternal health is difficult because of a serious selection problem. Since welfare is a last

resort for most mothers, those who turn to it for support are likely to be in poorer health than those who do not. Thus we would expect to find a negative association between welfare use and health.

With respect to child support, theory suggests that stronger child support policies should improve maternal health by improving the overall bargaining positions of mothers and by improving total income in the long run. In contrast, the effect of child support enforcement on mothers who depend on welfare is likely to be negative, since these mothers have little say in whether or not the father is ordered to pay child support and since child support dollars may not increase their income, at least in the short run. Strong child support enforcement may actually reduce the income of mothers on welfare if they have been receiving informal transfers from the father. Formal child support payments often substitute for informal payments and typically go to the state rather than to the mother (Nepomnyaschy and Garfinkel 2005). Most importantly, strong child support enforcement may increase conflict between mothers and non-resident fathers, which is expected to have negative effects on maternal health and health behavior. As in the case of welfare, estimates of the effects of child support policies on maternal health are likely to be biased by selection into the child support system. For non-welfare mothers, selection should be positive; that is, the most able and most healthy mothers should be the most likely to obtain a child support award. For mothers on welfare, however, selection should go in the opposite direction since welfare is selective of the least healthy mothers.

Empirical evidence

As noted in the introduction, the empirical research on the impact of welfare and child support policies on maternal health and health behavior is very limited. Although a number of studies have examined the association between welfare participation and maternal health, much of this literature is descriptive. The most frequently studied health outcome is depression, and here the causal evidence is weak (Lennon, Blome and English 2002) although some studies suggest a causal pathway (Ensminger 1995). A study by Currie and Cole (1993) that focuses primarily on child outcomes, finds that selection into AFDC accounts for most of the association between welfare participation and maternal smoking or

drinking during pregnancy. Research on the link between child support enforcement and maternal health is even more limited than research on the effects of welfare policies.

The welfare reform act of 1996 stimulated some research on the effects of more restrictive welfare policies on maternal health, but most of this research focused on health insurance coverage, and to a lesser degree, on health care utilization and health behaviors. See Bitler and Hoynes in this volume for a more detailed review of the welfare reform literature. Evidence to date is mixed as to the effect of welfare reform on health insurance coverage. Many researchers find that tougher (more restrictive) welfare policies are associated with a loss of health insurance (Cawley, Schroeder, and Simon 2006; Chavkin, Romero and Wise 2000; Garrett and Holahan 2000; Holl et al 2005), while others find little to no effect (Bitler and Gelbach 2005; Bitler and Hoynes 200x; Kaestner and Kaushal 2003). While there is some debate as to the link between health insurance and health outcomes (Levy and Meltzer 2004), there is substantial evidence that having health insurance is associated with more preventative care (Institute of Medicine, 2001). Therefore, it is not surprising that research suggests stricter welfare policies are associated with less health care utilization (Bitler and Gelbach 2005; Kaestner and Kaushal 2003; Kaestner and Lee 2005) and higher incidence of unmet health needs (Bitler and Gelbach 2005; Polit, London and Martinez 2001). A lack of health insurance coverage may contribute to future health problems if it inhibits mothers from seeking preventative care (Institute of Medicine 2002).

With respect to health behavior, the evidence is mixed. On the negative side, there is some evidence that tougher welfare policies and stricter work requirements reduce breastfeeding which is positively associated with maternal and child health. According to one study, breastfeeding would have been 5.5 percent higher in the absence of welfare reform (Haider, Jacknowitz and Schoeni 2003). There is also evidence that stronger child support enforcement is associated with increases in domestic violence, especially among mothers on welfare (Fertig, Garfinkel and McLanahan 2006). On the positive side, researchers have found that reductions in welfare caseloads (resulting from more restrictive policies) are associated with a reduction in binge drinking (Kaestner and Tarlov 2006).

Despite the loss of health insurance, less use of preventative care, and some evidence of poorer health behaviors, there is little to no evidence that more restrictive welfare policies are associated with poorer health or mental health in the years following welfare reform. Researchers find no effects of welfare on mother's weight, days in poor mental or physical health, or overall health status (Kaestner and Tarlov 2006; Bitler and Gelbach 2005). Although one study finds evidence that welfare recipients' health outcomes (hypertension, obesity, cholesterol) are worse after welfare reform, these results are based on a pre-post comparison of one state's welfare population compared with a national sample (Kaplan et al. 2005). It is also possible that the negative short-term impacts on health insurance coverage and health behaviors could have impacts on mothers' future health.

DATA AND METHODS

In this chapter, we use data from the Fragile Families and Child Wellbeing Study (hereafter "Fragile Families") to examine the effect of welfare and child support policies on maternal health outcomes. The Fragile Families study follows a cohort of approximately 5,000 births in 20 large U.S. cities between 1998 and 2000. Mothers were interviewed around the time of a child's birth, with follow-up interviews occurring around the child's first and third birthdays. At baseline, the Fragile Families sample included 1,186 married mothers and 3,712 unmarried mothers whose response rates were 82 percent and 87 percent respectively. Most of the health outcomes and behaviors are measured at the three-year follow-up. Therefore, we restrict the sample to mothers who responded to the three-year survey (N = 4,231 or 87 percent of mothers interviewed at baseline who remained eligible at the three-year follow-up). We exclude 1,051 mothers who were married at their child's birth as they are not the target population of these policies. We also drop 378 immigrants from the sample because Fragile Families does not have data on the immigrants' legal status and welfare policies are applied differentially to legal immigrants depending on the date of their arrival. Finally we drop 266 cases with missing data on one of our key measures or the one-year follow-up interview (used in the fixed effects), resulting in a final sample of 2,536 mothers.

Maternal health and health behaviors

Health outcomes and behaviors are measured at the three-year follow-up interview unless noted. For the fixed effects analyses, we present results for which we have repeated measures at the one- and three-year follow-up interviews. Unfortunately, we do not have comparable measures at baseline to allow us to include that wave in the fixed effects estimation.

We look at three measures of health inputs. Similar to the measures from the BRFSS, we look at indicator variables for whether the *mother had any health insurance* (private or Medicaid) and whether the mother reported *anyone in the household didn't go to doctor or hospital because he/she couldn't afford it*. Because nutrition is an important health input that has been shown to impact women's health, for example mental health (Heflin, Siefert and Williams 2005; Siefert et al. 2004) and obesity (Olson 1999), we also look at *hunger*. We do not have a full food insecurity scale. Therefore, we include an indicator of whether or not the mother reports she or her child went hungry at the one-year follow-up.

We look at two measures of overall health and wellbeing. The first is a categorical indicator of *overall health*, which is measured by a question that asks mothers whether they would describe their health as "excellent, very good, good, fair, or poor" with 1 representing excellent health and 5 representing poor health. The second is an indicator for whether the mother was *depressed or anxious*. This indicator is derived from the Composite International Diagnostic Interview Short Form or CIDI-SF (Walters et al. 2002). Respondents are classified as depressed if they report having feelings of dysphoria or anhedonia in the past year lasting for two weeks or more and if the symptoms lasted most of the day and if they occurred everyday during the two week period. Respondents are classified as anxious if they report feeling excessively worried or anxious about more than one thing, more days than not, and had difficulty controlling their worries. See CRCW (2006) for more information on how this measure is constructed.

We examine five stress-related behaviors that may impact women's health outcomes and might be affected by welfare or child support policies, including alcohol or drug dependence, binge drinking, smoking, parental conflict, and domestic violence. An indicator for *alcohol or drug dependence* is derived

from the CIDI-SF (Walters et al. 2002). Respondents are classified as being alcohol dependent if they had at least four drinks in one day and reported at least three out of the seven following symptoms: 1) role interference as a result of use, 2) use in hazardous situations, 3) emotional or psychological problems as a result of use, 4) a strong desire or urge to drink, 5) a great deal of time using or recovering, 6) drinking more or longer than intended, or 7) drinking more to get the same effect. Respondents are classified as drug dependent if they used at least one of the following drugs (sedatives, tranquilizers, amphetamines, analgesics, inhalants, marijuana, cocaine, LSD, and heroin), and reported three out of the seven dependence symptoms (previously described for alcohol dependence). We also include a less restrictive measure of alcohol abuse, specifically binge drinking. Binge drinking is defined as having four or more drinks in one day.¹ We also have a measure of *smoking* (defined as any smoking in month prior to the one-year follow-up).

Finally, we examine two measures of parental conflict: arguing and domestic violence. For the first measure, mothers were asked how often they *argue with the child's father* on a scale of 1 representing “always” and 5 representing “never.” We reverse-code this item so that higher equals more arguing. For the second measure, mothers were asked if they were “slapped or kicked” or “hit with a fist or object that could hurt you” “often, sometimes, or never.” Mothers who said they experienced any of these forms of violence “often or sometimes” by the child’s father or their current romantic partner are classified as having experienced domestic violence.

Table 1 shows the prevalence of health and stress-related outcomes and behaviors and outcomes in the sample. Most of the mothers in the sample have health insurance (75 percent), although a substantial minority (25 percent) is not covered by health insurance at the three-year follow-up. Only 7 percent of mothers report that someone in their household did not go to a doctor or hospital when they needed to in the past year because they could not afford it. This is not surprising given that such a high percentage of mothers is covered by insurance. Note however that this finding means that nearly one-third of mothers without health insurance (7 percent of 25 percent) are not seeking medical treatment when

they (or their family) need it. Five percent of mothers report that they or children went hungry compared to 3 percent nationally (Nord et al. 2002).

Mothers in the sample report somewhat less than “very good” health overall. On a scale of 1 to 5, where 1 represents “excellent” health and 5 represents “poor” health, the average score is 2.31. Thirteen percent of our mothers report being in “fair or poor” health as compared to 5 percent of a national sample of women aged 18-34. Mothers in our sample also report high rates of depression and anxiety (23 percent). Rates of depression and anxiety can vary widely depending on how they are measured, but our estimates are in line with estimates of depression among mothers with young children (Heneghan et al. 1998; Jayakody and Stauffer 2000) and much lower than those found in some other studies (Mulvaney and Kendrick 2005).

Using strict definitions of dependence, rates of alcohol and drug dependence are low (2 percent) in our sample of unmarried mothers. However, rates of binge drinking are considerably higher (12 percent). Smoking rates are particularly high (35 percent) as compared with national estimates of 21 percent for females over 18 in 2000-2002 (NCHS 2004).

On average, mothers report arguing with the child’s father between “sometimes” and “often.” Eleven percent of mothers report that the child’s father or a current partner has slapped, kicked, or hit them. These are rates of current and recent violence, as opposed to ever experienced violence, so the prevalence is lower than it would have been if we had included all prior experience. Our estimates are in-line with community samples of low-income women and on the lower side of these (Tolman and Raphael 2000).

Measuring the effects of welfare and child support policies and practices

As discussed in Bitler and Hoynes (this volume), it is difficult to study the effects of policies on health for several reasons. The first is that policies do not change very often. Changes in policies would help determine whether there were corresponding changes in behavior. Another is that when policies do change, the change often encompasses a package of changes and therefore it is difficult to parse out what part of the policy change(s) matters. Finally, one would ideally need policy changes across varying

contexts (for example, economic conditions) to be able to parse out the effects of policy changes in different environments.

Most of the research examining the effects of welfare policies on health outcomes is based on the welfare reforms of the late 1990s. Researchers used the fact that AFDC waivers essentially stretched out the welfare reform period, providing more variation in time and context. While these studies are incredibly valuable and provide most of what we know about the effects of welfare policies on health, using welfare reform to study the effects of policies more broadly suffers from many of the drawbacks mentioned above. First, welfare reform encompassed large-scale changes, with many policy changes occurring at the same time, making it difficult to determine what elements of policies might matter most. Welfare reform also occurred in an era of a strong economy and in an era of public health insurance expansions (Blank 2002) and similar policy changes in an alternate environments may not have had the same effect.

In this volume, Bitler and Hoynes use data from welfare-to-work experiments to examine the impact of welfare policies on health. Experiments allow researchers to compare the effects of different program components and have the advantage of a control group. But experiments are also limited by context and, without a large number of experimental evaluations, suffer from an inability of parsing out the components of welfare policies that may be impacting health. Experimental evaluations also often miss the impact on those who never received welfare perhaps in response to the reforms themselves.

Using data from the Fragile Families' and Child Wellbeing Study, we attempt to measure the effects of welfare policies post-reform on maternal health. We have longitudinal data from twenty cities in fifteen states, but policies do not change very often so we cannot examine state level change using state fixed effects. Therefore, we rely on individual level relationships to assess the relationship between welfare and child support policies on maternal health and wellbeing. We use a four-fold analysis strategy – triangulating results from ordinary least squares (OLS), fixed effects, reduced form, and instrumental variables analyses.

First, because welfare and child support policies have their most proximate effects via causing mothers to either be on welfare or to receive child support, we look at the relationships between welfare and child support receipt and maternal health behaviors and outcomes using OLS. We recognize that the associations between health and welfare and child support receipt are biased estimates of the effects of policies on health because poor health contributes positively to welfare receipt and most likely negatively to child support receipt. Thus the observed relationships provide upper bound estimates of the effects of welfare and child support policies on health.

Next, for outcomes for which we have repeated measures at the one- and three-year follow-up interviews, we estimate individual fixed effects models in which the dependent variable is the change in health status and the key independent variables are the change in welfare and child support receipt. This more restrictive model looks at changes associated with moving into welfare and child support net of observed and unobserved stable characteristics of the mother. However, the association between observed changes in welfare and child support receipt and health does not deal with the more serious bias of reverse causation, namely that changes in health status or behavior may lead to changes in welfare receipt.

To try to get around the issues of selection bias and reverse causality, we employ instrumental variables. We use welfare and child support policies and practices as instruments to predict welfare and child support receipt. Specifically we use welfare rules and the strength of child support enforcement as instrumental variables that determine welfare and child support receipt. Then we see if these predicted variables, which are purged of individual-level unobserved characteristics that may be correlated with welfare and child support receipt and with maternal health, are associated with maternal health. Essentially one can interpret the instrumental welfare and child support variables like an index of the generosity of welfare policies and practices and the stringency of child support enforcement policies and practices. This is because the more generous the welfare policies in a city (in terms of higher benefits and more lenient sanctions), the more likely mothers are to receive welfare. Similarly, the more stringent the child support policies and practices in a city, the more likely mothers are to receive child support. There

are two key assumptions required by the instrumental variables models. First, the policies must do a good job predicting welfare receipt (first stage equation). The policies do appear to be good predictors of welfare and child support receipt and first-stage results are presented later in the methods section. Second, the policies should not be correlated with health outcomes except through their effects on welfare and child support receipt. While we think this is fairly plausible for most outcomes, there certainly could be unobserved city variables that are correlated with both policies and maternal health outcomes. To check for the exogeneity of the regressors, we compute a test of over-identifying restrictions using Hansen's J-statistic. Finally, we estimate reduced form models in which welfare and child support policies across cities and states are the key independent variables. The reduced form models test for the effects of welfare policies more generally, as opposed to welfare receipt specifically.

For the individual-level analyses our measure of *welfare receipt* is an indicator for whether the mother reported receiving any income from TANF in the 12 months preceding the three-year follow-up.² Our measure of *child support receipt* is an indicator for whether the mother reported receiving any child support dollars from the focal child's father or the father of a different child. In all of the models, we control for individual level characteristics that may be associated with welfare receipt and health but are exogenous to welfare and child support receipt, specifically mother's age, race/ethnicity, education, and parity.

We use two indicators of welfare generosity in the instrumental variables and reduced form models: 1) the maximum TANF + FS benefit and 2) the harshness of sanctions for non-compliance. The maximum TANF + FS benefit is calculated for a family of three with no other income in 1999 (obtained from the State Policy Documentation Project (www.spdp.org)). This term is divided by \$100 in the models. We also include a squared term to capture non-linear effects of TANF benefits. To measure sanctioning policy we use a variable that categorizes whether a state's sanctioning policies were lenient (1), moderate (2), or stringent (3) as categorized by Pavetti and Bloom (2001). Stringent sanctions indicate that a state imposes immediate full-family sanctions or imposes gradual full family sanctions with an immediate 100 percent reduction in Food Stamp benefits or elimination of Medicaid. Moderate

sanctions indicate that a state imposes gradual full-family sanctions with no sanction of Food Stamp benefits or Medicaid or a partial sanction with a 100 percent sanction on Food Stamp benefits. Lenient sanctions indicate that a state imposes partial sanctions with < 100 percent sanction on Food Stamp benefits. We tried incorporating alternative measures of welfare generosity including time limits, sanction amounts, work requirements, earnings disregards, but these variables were not significant in the presence of TANF and Food Stamp Benefits and sanction policies and thus we did not include them in the models.

To measure the strength of child support enforcement we use an index that combines measures of the legal framework, state expenditures on enforcement, and a practice measure that captures states' actual performance in collecting child support. The index was constructed by Nepomnyaschy and Garfinkel (2005). The legal framework incorporates three groups of laws: (1) three laws pertaining to paternity establishment (allowing paternity to be established until the child is 18, mandating genetic testing and making voluntary paternity conclusive), (2) universal wage withholding, and (3) the three most recent federally mandated laws (the New Hires directory, license revocation for nonpayment, and automation). Paternity establishment is the pre-requisite for enforcing support among the unmarried, while previous research has found universal withholding to be the single most important enforcement tool. Finally, because all of these laws were mandated by the federal government during the eighties and early nineteen nineties, the index also includes the three most recently mandated laws. For each law, the year that the law became effective in the state is entered, then standardized to have a mean of 0 and a standard deviation of 1, and inverted, so that the longer the laws have been on the books, the greater the value. Each index represents the average score for each state on that set of measures. Total state expenditures on child support enforcement in 1999 were divided by the state population and were also standardized. The final component is an adjusted payment rate ratio from 2000 city-level Census data. The ratio is constructed by regressing the probability that an unmarried mother received any child support on the mother's race/ethnicity, age, education, nativity, parity, presence of child under age 6, state-level median male wage and maximum combined TANF/FS benefit in the state. From this equation, an

aggregate city-level probability of receiving support is predicted, and the raw aggregate probability of receiving support is divided by this adjusted measure. This measure is also standardized.

The welfare and child support policies for the states in the Fragile Families sample are displayed in Table 3, along with the percent of mothers who received welfare in the past year and the percent of mothers who receive child support. Maximum TANF plus Food Stamps benefits ranged from \$526 to \$907. Nine states had stringent sanction policies, 3 had moderate and 3 had lenient sanction policies. The combined effect of the generosity of these welfare policies can be observed in the variation in mother's rates of receiving welfare in the past year. Receipt rates generally rise with the generosity of TANF and food stamp benefits and the leniency of sanctions. We also observe a strong relationship (particularly at the tails) between the strength of the state's child support enforcement (which is adjusted for the demographic composition of the state) and the percent of mothers' receiving child support. On the whole, states had an average of 30 percent of mothers receiving welfare in the past year and 28 percent receiving child support.

The results from the first stage of the instrumental variables models are presented in Table 3. We used two-stage least squares, with standard errors clustered at the state level. The F-statistics for the test of the joint significance of the four instruments are large (20.6 and 66.7) and statistically significant at the $p \leq .05$, level indicating that even after controlling for individual-level characteristics, the instruments are significant predictors of welfare and child support receipt. As expected, both higher TANF and Food Stamp benefits and more lenient sanctions are associated with greater welfare receipt, although the relative impact of high benefits declines with higher levels of welfare benefits. Similarly, the strength of child support enforcement is strongly related to the likelihood of receiving child support. Both measures of welfare generosity are associated with lower levels of child support receipt and considered jointly they are significant at the $p \leq .01$ level. This result is not surprising if mothers view TANF as an alternative to child support. What is surprising is that, contrary to what has been found in other studies, strict child support enforcement is not associated with a reduced probability of receiving welfare in the past year.

However, if we specify welfare as current receipt or total welfare dollars received, the sign on the child support enforcement coefficient is negative though insignificant.

Individual level characteristics predict welfare and child support receipt in a manner consistent with previous research. Relative to black mothers, white and Hispanic mothers receive less welfare and less child support. Mother's age is negatively associated with receiving welfare, but positively associated with receiving child support. Mother's education is negatively associated with welfare receipt, but not associated with receipt of child support. Higher parity raises the likelihood of receiving welfare and child support.

RESULTS

In the first part of the analysis, we examine the relationship between observed welfare and child support receipt and maternal health and health behaviors using OLS regression and controlling for a set of individual characteristics (Table 4). In terms of the demographic characteristics of mothers, white and Hispanic mothers report higher rates of hardship, binge drinking, and domestic violence than black mothers. Increasing age is associated with increased depression/anxiety, but less parental conflict and domestic violence. Having higher education is associated with better health outcomes and behaviors, while having more children is associated with higher rates of smoking.

In terms of our variables of interest, receiving welfare is associated with greater health insurance coverage. This is not surprising as the process for getting Medicaid is more straightforward for mothers on welfare than mothers who are not on welfare (Gold 1999). Despite being associated with greater access to health insurance, as expected, welfare receipt is associated with a host of poor health outcomes and health behaviors. Mothers who received welfare in the last year report worse overall health, higher rates of depression and anxiety, and greater levels of food insecurity. For instance, mothers who received welfare had rates of depression and anxiety 8 percent higher than mothers who did not receive welfare last year. Welfare receipt is also associated with higher rates of stress-related behaviors including greater alcohol and drug dependence, smoking, parental arguing, and domestic violence. For example, mothers

who received welfare were 4 percent more likely to report domestic violence by a partner than mothers who did not receive welfare.

Child support receipt is not associated with as many maternal health behaviors and outcomes as welfare receipt. Receiving child support is associated with reductions in reporting having gone hungry and child support is associated with higher rates of parental conflict and domestic violence, which is consistent with previous findings on the effects of strong enforcement (Fertig et al. 2006).

Table 5 presents results from the OLS, fixed effects, IV, and reduced form regressions. We have re-oriented Table 5 so that the key independent variables (welfare receipt/policies and child support receipt/policies) appear across the top and the outcome variables appear down the left hand side column. Welfare results are presented in the top panel and child support results are presented in the bottom panel. Structuring the table in this way facilitates comparisons across the models. The results from the fixed effects models show the association between changes in welfare and child support receipt and changes in health outcomes between the one- and three-year follow-ups (roughly a two-year time span) and are not available for all of our health measures. For welfare, the fixed effects estimates indicate that receiving welfare is associated with greater access to health insurance, which is consistent with both theory and previous research. The rest of the coefficients are small in size and none are statistically significant. For child support, the estimates indicate that child support receipt is associated with greater maternal depression (significant at the .10 level).

As discussed previously, the fixed effects estimates will be biased to the extent that causation runs from changes in health to changes in welfare and child support receipt. We also could not calculate fixed effects for all of the measures. Therefore, we employ both IV and reduced form models, which allow us to eliminate unobserved characteristics of mothers that do not change over time and which may be correlated with welfare and child support receipt and with maternal health. First, we use instrumental variables to predict mothers' welfare and child support receipt and see if the predicted receipt variables are associated with mothers' health and wellbeing. The interpretation of the instrumental welfare and child support variables is that they measure the generosity of welfare policies and practices and the

stringency of child support enforcement policies and practices as they operate through welfare receipt. The more generous the welfare policies in a city—taking account of both benefit levels and sanctions--the more likely mothers are to receive welfare. Similarly, the more stringent the child support policies and practices in a city, the more likely mothers are to receive child support. Note that as is conventional for IV models, the predicted levels of welfare and child support are estimated as linear functions. The same is true for the reduced form child support models. But, the reduced form models for welfare allow the effects of increased benefit levels to vary depending upon the level of benefits (using a squared term) and allow the effects of benefits and sanctions to differ from one another.

Looking first at the top panel welfare results, the first thing to note about the IV estimates is that none of the coefficients are significant at the .05 level.³ This is not unusual for IV estimates as both coefficients and standard errors frequently increase. Indeed the magnitude of the coefficients is much larger than those obtained from the OLS and fixed effects models. By way of contrast, a large number of coefficients in the reduced form results are highly significant; and, most important, the linear and squared terms for benefit level have opposite signs. The latter provides a substantive explanation for why the linear IV coefficients are insignificant. The relationship between increases in welfare generosity and health varies from positive at low levels of welfare benefits to negative at high levels of welfare benefits.

How the effects on health of increases in welfare generosity depends upon the level of generosity can be seen from Figure 1 panels A, B, C, D, and E, which display the predicted health values at different levels of welfare benefits for each of the five health outcomes with significant coefficients. Each benefit level is associated with three different levels of sanctions (lenient, moderate, and stringent) and therefore there are three curves for each outcome. Note, however, from table 5 that only in the case of smoking is the sanction variable itself statistically significant.

Panel A indicates that when welfare benefits are very low, increases in generosity reduce the likelihood that mothers refrained from seeking needed medical care because they could not afford it. Once benefits reach a relatively high level, however, further increases in benefits actually have a negative effect. The initial decline in this measure of hardship makes sense. However, the increase in hardship

that occurs when relatively high benefits get higher is more difficult to explain. But, note that this pattern is consistent with the effects on our other hardship measure—hunger – and indeed for all of our measures of health except cigarette smoking. Why increases in benefit levels should have positive effects at low benefit levels and negative effects at high benefit levels is a puzzle, and why the effects on smoking are the opposite is perhaps even more puzzling.

Oft times too much of a good thing is not so good. One possible interpretation is that at low levels of welfare benefits, increases in benefit levels have the intended effect of reducing maternal stress and thereby improving mental health. But once benefits reach a certain level, the negative effects of higher benefits outweigh the positive effects. High benefits could decrease work and increase isolation, and thereby increase depression, anxiety, and self-medication. These results are consistent with other research that examines the impacts of welfare receipt on mother’s wellbeing (Casey et al. 2004; Ensminger 1995; Jayakody, Danziger and Pollack 2000). While this explanation is plausible, for two reasons, it must remain only suggestive. First, we have no explanation for the inconsistent smoking results. Second, the results are being generated by a cross section of only twenty different cities. Something else could easily be driving these results.

The child support results suggest that stronger child support enforcement is also associated with higher rates of maternal stress-related behaviors and outcomes. Stronger child support enforcement is associated with higher rates of maternal depression and anxiety, higher rates of binge drinking, and smoking, and lower levels of subjective health. All of these outcomes could operate through higher rates of parental conflict and the coefficients of both the IV and reduced form coefficients are positive, although neither come close to being significant.

DISCUSSION AND CONCLUSIONS

This chapter examines the effects of welfare and child support policies on maternal health and health behaviors using data from the Fragile Families and Child Wellbeing Study. Initially we argued that theory was ambiguous with respect to how generous welfare policies, defined as policies that encourage

welfare participation, might be expected to affect maternal health. On the one hand, welfare was designed to alleviate mothers' financial problems, in which case policies that make it easy for a woman to obtain welfare should reduce stress and improve health. On the other hand, by encouraging economic dependence and lack of structure, welfare participation may actually increase stress and reduce maternal health. According to the results presented here, both theories are true: at low levels of welfare benefits, more generous benefits are associated with increases in health while at high levels of welfare more generous benefits are associated with decreases in health (with the exception of smoking).

We also argued that the effects of strong child support enforcement were ambiguous for unmarried mothers, especially those at risk for being on welfare. Whereas strong child support enforcement might be expected to increase the incomes of mothers in the long run, it may actually reduce income in the short term by replacing informal support paid to the mother with formal child support paid to the state (Nepomnyaschy and Garfinkel 2005). Moreover, since low income mothers are required to cooperate with the child support system in identifying non-resident fathers, stronger enforcement may lead to greater conflict between unmarried parents thus further increasing stress. Our findings are consistent with a story in which stricter child support enforcement leads to increases in drinking, smoking, and depression and ultimately to poorer overall health. The welfare and child support findings are consistent insofar as both imply that income transfer policies have their greatest impact via mental health and mental health behavior.

As discussed in the methods section, examining the health effects of welfare and child support enforcement is a difficult topic to study. At the macro level, it is difficult to estimate the effects of policies because welfare and child support policies do not change often and changes frequently co-occur with other policy changes, which make it difficult to parse out the effects of the welfare policies and other factors. At the individual level, policy effects may interact with individual characteristics and it is difficult to parse out the effects of policies and program participation. Given these methodological complications, researchers would ideally rely on a large data set that included city-level data for all 50 states over time in order to be able to detect the effects of policy changes in different contexts, while

employing city and state fixed effects to control for other city and state level factors that are changing. Ideally these data would also include a large sample of low-income women and detailed health data. However, few data sets meet these criteria. Experimental data also useful, particularly as we accumulate more state level studies over time.

Given the limitations of the Fragile Families data set for examining this topic, we attempted to triangulate results from four different types of individual level analyses. However, our analysis has several limitations which should be kept in mind when interpreting the results. First, the OLS and fixed effects estimates are problematic because of selection, and many of the coefficients from the IV models are not measured precisely. Thus our results should be viewed as suggestive. Second, all of our health variables are measured by mothers' reports, which means that they are subjective and may be affected by response bias. The fact that the policies affect some of these measures and not others indicates to us that response bias is not a serious problem. And perhaps most important, the policy instruments we use in this analysis are measured at only one point in time and thus our estimates of their effect are based on between-city differences in policies rather than within city changes in policies over time. We cannot rule out the possibility that the effects attributed to welfare and child support policies are due to some unmeasured characteristics of the city other than these two sets of policies. Despite these caveats, we believe that our analysis makes a contribution to the literature by documenting both the positive and negative health effects of welfare and the negative effects of child support policies on a sample of low income mothers of young children – the very mothers these policies are intended to help. Insofar as our results hold up in future analyses, they indicate that more attention should be given to the 'unanticipated consequences' of income transfer policies.

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¹ At the one-year follow-up, binge drinking is classified as having five-drinks or more.

² For the two outcomes measured at the one-year interview (hunger and smoking), the welfare and child support receipt measures refer to the year prior to the one-year interview.

³ We could not estimate models for health insurance as they were overidentified because other factors at the city level that predict welfare receipt and health insurance coverage are not captured by our instruments.

Table 1: Means of key measures

	<i>Unweighted Percent/Mean</i>
Health inputs and outcomes	
Has health insurance (%)	75.0
Didn't go to doctor/hospital because couldn't afford it (%)	7.0
Mother or child went hungry ¹ (%)	4.9
Overall health (high = poor) (mean)	2.31
Depressed/anxious (%)	24.5
Stress-related behaviors	
Alcohol/drug dependent (%)	1.7
Binge drinking (%)	11.8
Smoking ¹ (%)	34.7
Argues with child's father (high = more) (mean)	3.15
Domestic violence (any partner) (%)	11.1

N = 2,536

Notes:

Sample includes only mothers unmarried at the focal child's birth.

¹ Measured at the one-year follow-up

Table 2: Welfare and child support policies by state

State	Max TANF +FS /\$100	Sanction policies	Child support enforcement index	Received welf past year	Receives child support
Texas	5.3	Moderate	-0.215	19%	30%
Tennessee	5.6	Strict	-0.602	30%	28%
Indiana	6.2	Lenient	-0.397	34%	21%
Virginia	6.2	Strict	0.657	27%	33%
Florida	6.3	Strict	-0.006	15%	46%
Illinois	6.8	Moderate	-0.826	31%	15%
Maryland	6.9	Strict	-0.297	25%	26%
Ohio	6.9	Strict	1.766	32%	49%
Pennsylvania	7.3	Moderate	0.021	37%	26%
New Jersey	7.4	Strict	0.741	35%	26%
Michigan	7.7	Strict	0.709	30%	25%
Massachussetts	8.5	Strict	0.187	44%	34%
New York	8.6	Lenient	-0.325	37%	18%
California	8.7	Lenient	0.162	37%	21%
Wisconsin	9.1	Strict	1.947	30%	43%
<i>All states in sample</i>	7.0	Mod/Strict	0.248	30%	28%

Table 3: First-stage regression equations

	Received welfare	Received child support
<i>Mother characteristics</i>		
White	-0.148 ** (.027)	-0.003 (.020)
Hispanic	-0.114 ** (.021)	-0.016 (.022)
Age	-0.039 * (.019)	0.028 * (.012)
Age ²	0.001 ^ (.000)	-0.001 ^ (.000)
Less than high school degree	0.126 ** (.024)	0.004 (.028)
Any college education	-0.080 ** (.019)	0.058 ** (.023)
Two children	0.081 * (.034)	0.087 * (.038)
Three or more children	0.153 ** (.041)	0.089 ** (.026)
<i>Instruments</i>		
(Max TANF+FS 1999)/\$100	0.223 * (.105)	-0.203 ^ (.107)
((Max TANF+FS 1999)/\$100) ²	-0.014 ^ (.008)	0.012 (.008)
Sanctions (higher = stricter)	-0.051 * (.022)	0.040 (.016)
C.S. enforcement (higher = stronger)	0.001 (.029)	0.087 ** (.022)
Constant	0.126 (.377)	0.573 (.361)
F-statistic	20.6	66.7
p of F-statistic	0.047	0.015

Notes:

Robust standard errors in parentheses. Standard errors clustered at state level.

** p<0.01; * p<0.05; ^ p<0.10 two tailed

Table 4: OLS models predicting effects of welfare and child support receipt on maternal health and health behaviors

	Health insurance	No doctor	Hungry	Overall health	Depressed/ anxious	Alc/drug dependent	Binge	Smoke	Argues	Domestic violence
Received welfare last year	0.215 ** (.017)	-0.006 (.011)	0.040 ** (.011)	0.106 * (.050)	0.077 ** (.021)	0.017 * (.007)	-0.016 (.014)	0.056 ** (.021)	0.090 ^ (.059)	0.038 * (.015)
Receives child support \$	0.005 (.018)	0.000 (.011)	-0.020 * (.010)	0.034 (.048)	0.008 (.020)	-0.008 (.005)	0.012 (.014)	-0.046 ^ (.024)	0.247 ** (.045)	0.026 ^ (.015)
White	-0.087 ** (.025)	0.065 ** (.017)	0.033 * (.014)	0.103 ^ (.057)	0.038 (.025)	0.009 (.008)	0.117 ** (.021)	0.270 ** (.027)	-0.031 (.055)	0.049 ** (.019)
Hispanic	-0.136 ** (.023)	0.026 ^ (.014)	0.001 (.010)	0.104 ^ (.054)	-0.025 (.021)	-0.012 ** (.004)	0.086 ** (.018)	-0.023 (.023)	-0.025 (.052)	0.037 * (.017)
Age	-0.005 (.013)	0.006 (.008)	-0.001 (.006)	0.020 (.034)	0.029 * (.014)	-0.004 (.005)	-0.003 (.010)	0.009 (.016)	-0.059 ^ (.033)	-0.019 ^ (.011)
Age squared	0.000 (.000)	0.000 (.000)	0.000 (.000)	0.000 (.001)	-0.001 * (.000)	0.000 (.000)	0.000 (.000)	0.000 (.000)	0.001 (.001)	0.000 (.000)
LT high school	-0.050 * (.020)	0.012 (.013)	0.012 (.010)	0.097 ^ (.052)	0.034 ^ (.021)	-0.007 (.007)	-0.027 ^ (.015)	0.127 ** (.023)	0.026 (.051)	0.018 (.016)
Any college	0.039 ^ (.022)	0.023 ^ (.014)	0.017 (.010)	-0.093 ^ (.051)	0.010 (.022)	-0.001 (.007)	0.010 (.017)	-0.075 ** (.023)	0.013 (.051)	-0.007 (.015)
Two children	-0.022 (.025)	0.024 (.016)	0.017 (.013)	0.113 ^ (.064)	0.031 (.026)	0.005 (.007)	-0.028 ^ (.017)	0.085 ** (.028)	-0.140 * (.057)	0.010 (.018)
Three+ children	-0.073 ** (.028)	0.019 (.019)	0.012 (.015)	0.123 (.077)	0.044 (.030)	0.012 (.010)	0.008 (.020)	0.119 ** (.033)	0.024 (.072)	0.066 ** (.023)

** p<0.01; * p<0.05; ^ p<0.10 two tailed

Table 5: OLS, Fixed Effects, second-stage IV, and reduced form results for the effects of welfare and child support on maternal health and health behaviors

Outcome	<i>Received welfare last year</i>			<i>Reduced form</i>		<i>Sanction (higher = less strict)</i>
	<i>OLS</i>	<i>FE</i>	<i>IV</i>	<i>TANF\$</i>	<i>TANF^2</i>	
Health inputs and outcomes						
Has health insurance	0.215 ** (.017)	0.136 ** (.021)	--	0.124 (.158)	-0.004 (.012)	-0.017 (.024)
No doctor/hospital-couldn't afford	-0.006 (.011)	0.005 (.011)	-0.285 (.207)	-0.158 * (.067)	0.010 * (.005)	0.001 (.009)
Mother or child went hungry	0.040 ** (.011)	n/a	0.145 (.152)	-0.137 ** (.034)	0.010 ** (.002)	0.008 (.006)
Overall health (high = poor)	0.106 * (.050)	-0.018 (.048)	0.319 (.329)	-0.205 (.143)	0.013 (.010)	-0.020 (.017)
Depressed/anxious	0.077 ** (.021)	0.013 (.021)	0.409 (.264)	-0.199 ** (.061)	0.014 ** (.004)	0.007 (.010)
Stress-related behaviors						
Alcohol/drug dependent	0.017 * (.007)	n/a	0.102 ^ (.062)	-0.003 (.020)	0.000 (.002)	0.006 ^ (.003)
Binge drinking	-0.016 (.014)	-0.013 (.014)	0.175 (.347)	-0.212 * (.085)	0.014 * (.006)	0.017 (.014)
Smoking	0.056 ** (.021)	n/a	0.932 ^ (.487)	0.444 ** (.077)	-0.032 ** (.006)	0.040 ** (.013)
Argues with father (high = more)	0.090 ^ (.059)	n/a	0.167 (.545)	0.363 (.231)	-0.026 (.017)	-0.024 (.036)
Domestic violence (any partner)	0.038 * (.015)	0.004 (.016)	-0.105 (.134)	-0.044 (.044)	0.003 (.003)	-0.003 (.007)

Table 5 (continued): OLS, Fixed Effects, second-stage IV, and reduced form results for the effects of welfare and child support on maternal health and health behaviors

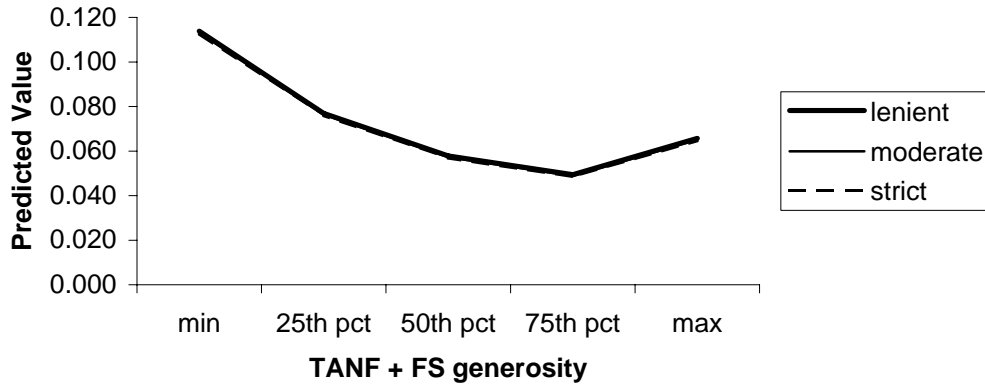
Outcome	<i>Receives child support</i>			<i>Reduced form</i>
	<i>OLS</i>	<i>FE</i>	<i>IV</i>	<i>C.S. index</i>
Health inputs and outcomes				
Has health insurance	0.005 (.018)	-0.015 (.024)	--	-0.025 (.036)
No doctor/hospital-couldn't afford	0.000 (.011)	0.006 (.013)	-0.014 (.119)	0.006 (.008)
Mother or child went hungry	-0.020 * (.010)	n/a	0.012 (.249)	0.003 (.007)
Overall health (high = poor)	0.034 (.048)	0.021 (.052)	0.988 ** (.348)	0.072 ^ (.028)
Depressed/anxious	0.008 (.020)	0.037 ^ (.021)	0.388 ^ (.230)	0.020 (.017)
Stress-related behaviors				
Alcohol/drug dependent	-0.008 (.005)	n/a	0.034 (.044)	0.003 (.006)
Binge drinking	0.012 (.014)	0.015 (.018)	0.315 ^ (.172)	0.031 (.018)
Smoking	-0.046 ^ (.024)	n/a	0.978 * (.463)	0.063 ** (.014)
Argues with father (high = more)	0.247 ** (.045)	n/a	0.428 (.357)	0.040 (.046)
Domestic violence (any partner)	0.026 ^ (.015)	0.017 (.017)	-0.025 (.076)	-0.002 (.010)

Robust standard errors in parentheses. Standard errors clustered at state level.

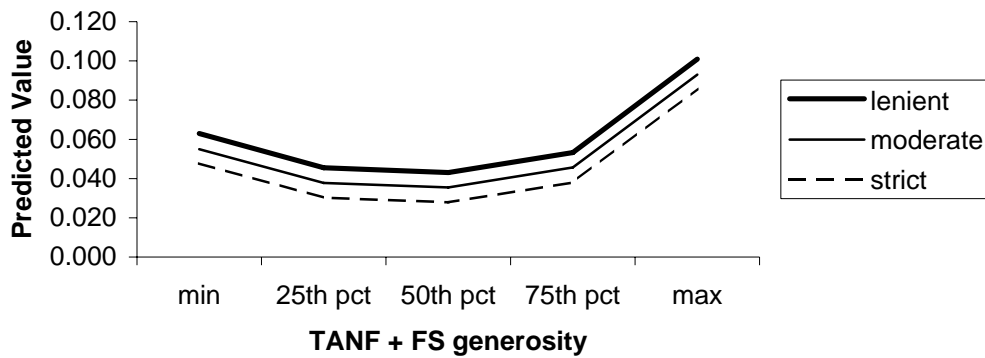
-- means the model is overidentified. Hansen J-statistic significant at 10 percent level or below.

Figure 1: Reduced form results of TANF and Food Stamp generosity by stringency of sanctions

Probability of not going to doctor because of cost



Probability of experienced hunger



Probability of being depressed or anxious

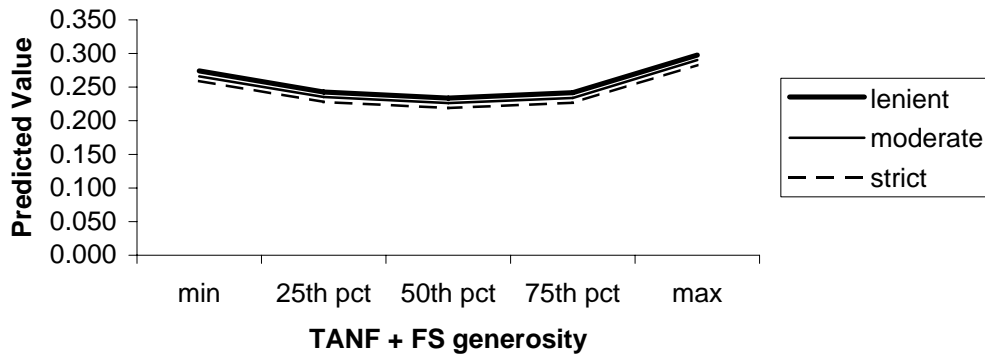
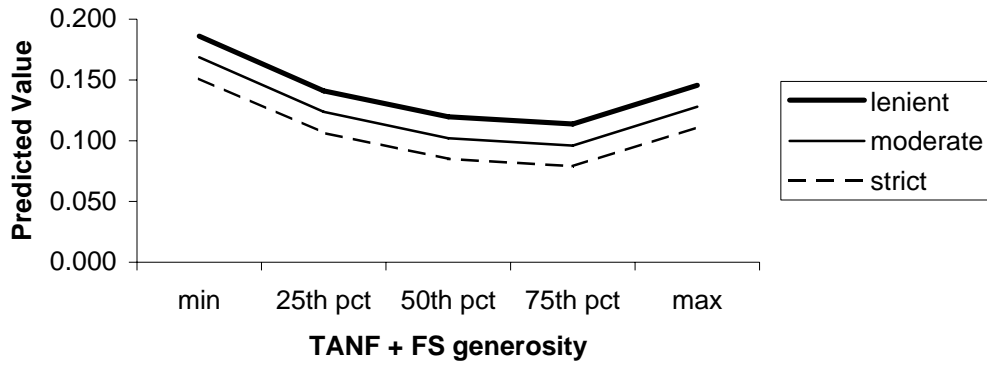


Figure 1 (continued)

Probability of binge drinking



Probability of smoking

