



Women's status and child well-being: A state-level analysis

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Abstract

We conducted an ecologic analysis of the relation between women's status and child well-being in the 50 United States. State-level women's status was assessed via four composite indices: women's political participation, economic autonomy, employment and earnings, and reproductive rights. Child well-being was measured via five outcomes: percentage of low birthweight babies, infant mortality, teen mortality, high school dropout rate, and teen birth rate. Higher state-level women's status on all indicators was associated with significantly better state-level child well-being in unadjusted analyses. Several associations remained significant after adjusting for income inequality and state racial composition. Women's political participation was associated with a significantly lower percentage of low birthweight babies ($p < .001$) and lower teen birth rates ($p < .05$). Women's employment and earnings was associated with lower infant mortality ($p < .05$) and teen birth rates ($p < .05$). More economic and social autonomy for women was associated with better child outcomes on all measures ($p < .01$ all). Greater reproductive rights were associated with significantly lower infant mortality ($p < .01$). We conclude that child well-being is worse in states where women have lower political, economic, and social status. Women's status is an important aspect of children's social context which may impact their well-being. Multi-level analyses of the association between state-level women's status and child well-being are needed.

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Keywords: United States; Women's status; Child well-being; Ecologic study; Infant mortality; Low birthweight

Introduction

The United States continues to compare poorly to other industrialized countries on a range of child outcomes despite being one of the wealthiest countries in the world in terms of per capita income (United Nations, 2005). In an effort to identify societal determinants of child well-being in the

United States, we examined the state-level association between five child health outcomes (percent low birthweight babies, infant mortality, teen mortality, high school drop out rate, and teen birth rate) and four composite indices of women's status: political participation, employment and earnings, economic and social autonomy, and reproductive rights. Our focus on women's status as a societal determinant of child well-being was inspired by research in developing countries where the positive correlation between women's social status and child well-being is well-documented (Institute for Food Policy Research [IFPR], 2003). In fact, improving gender

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equality is argued as a necessary step in the effort to improve child outcomes in such countries (World Bank, 2003).

In countries where women exert more economic and political power, children experience more positive nutritional outcomes, even after accounting for differences in economic development between countries (IFPR, 2003). Investment in women's education in developing countries has been shown to significantly reduce child mortality rates; higher levels of maternal education are associated with enhanced child nutrition, improved quality of child care, and lower fertility rates (World Bank, 2003). Better child health outcomes are also associated with women's income control in the household. Increases in overall household income are associated with reduced child mortality. However, when household income is controlled by women, risk of child mortality is substantially lower than in households where income is controlled by men (World Bank, 2003). Thus, data from developing countries suggest that women's social status may be an important societal level determinant of children's well-being.

Social epidemiology seeks to identify the social determinants of population health (Krieger, 2001). The ecosocial theory from the field of social epidemiology provides one framework for understanding the association between women's status and child well-being. Ecosocial theory recognizes that humans are at once social and biological beings, and that bodies come to incorporate and reflect structural social inequalities (Krieger, 2001; Krieger & Gruskin, 2001). A central construct of ecosocial theory is embodiment. Embodiment has been defined as "a concept referring to how we literally incorporate, biologically, the material and social world in which we live, from in utero to death" (Krieger, 2001, p. 672). There are multiple explanations for the association between women's status and child well-being in developing countries that are consistent with the construct of embodiment (IFPR, 2003 adapted from Engle, Menon, & Haddad, 1999). Here we outline some examples that can be extended to women in the United States.

Women's status in a society is determined in part by women's access to education, medical care, and economic autonomy, each of which has direct implications for child well-being. Women with access to education are more likely to be exposed to knowledge about the importance of positive health behaviors; they are less likely to smoke

during pregnancy. If women have poor access to pre- and post-natal medical care, they are unlikely to receive information on proper nutrition during pregnancy and on the benefits of breastfeeding, both of which have direct consequences for child outcomes such as birthweight (WHO, 1995). Lower status women may not have control over household income and, therefore, may not have the resources to purchase foods recommended during pregnancy and avoid others (e.g. foods at risk for listeriosis). Thus, during pregnancy and early childhood, children literally "embody" (biologically incorporate) the social status of their mothers.

Embodiment, as a way of explaining the association between women's status and child well-being, can be extended well past the postnatal period. Like women in the developing world, women in the United States are the primary caretakers for children (Hochschild, 1989). Children who are not in the care of their mothers are most often in the care of other women, whether in day care situations or in a school setting. Women as caretakers, therefore, provide children's primary connection to the larger social structure. In fact, assets controlled by women are more likely than those controlled by men to be spent in ways that benefit children (e.g. Quisumbing & Maluccio, 2003). Women's status may also indirectly affect children through exposure to domestic violence and maternal depression. In the United States, state-level gender inequality is associated with rates of severe marital violence (Yllo, 1983). Domestic violence puts women at increased risk of depression, and maternal depression adversely impacts child well-being (Moses-Kolko & Roth, 2004).

Despite evidence in the international arena of the importance of women's status on children's health, a comprehensive state-level analysis of the association between women's status and child well-being in the United States has not been conducted. The one exception is a study by Kawachi, Kennedy, Gupta, and Prothrow-Stith (1999) which focused primarily on adult health outcomes. Using the same Institute for Women's Policy Research indicators of state-level women's status (political participation, employment and earnings, social and economic autonomy, and reproductive rights) examined in the present study, Kawachi et al. (1999) found that women and men experience higher morbidity and mortality in states where women have lower social status. Kawachi et al. (1999) also reported that states ranked higher in terms of women's economic

autonomy and reproductive rights had lower infant mortality after controlling for income inequality. This finding provides initial evidence that women's status may be associated with children's health outcomes at the state-level.

An ecologic analysis of the association between state-level income inequality and child well-being was recently conducted by McLeod, Nonnemaker, and Call (2004). McLeod et al. (2004) concluded that state-level income inequality was not a predictor of child well-being after adjusting for state racial composition. Rather, the larger the proportion of the state's population identified as black, the higher percentage of low birthweight babies, infant mortality rate, teen birth rate, and high school drop out rate, after adjusting for state-level income inequality. McLeod et al. (2004, p. 249) stated that "the effects of racial composition on child well-being appear to be compositional (e.g. they reflect less positive outcomes observed among racial/ethnic minorities) rather than contextual (e.g. representing the independent influences of social context)". However, McLeod et al. (2004) did not consider the effect of state-level women's status on child well-being.

This paper examines the association between state-level women's status and child well-being in the 50 United States. Taking into account the previous work of Kawachi et al. (1999) and McLeod et al. (2004), we test whether any significant association is independent of both the effects of income inequality and state racial composition. States exert a great deal of control over the construction of public policy relevant to women's status and child welfare. States are, therefore, appropriate entities for an ecologic study of the aggregate effects of women's status on child well-being. In conducting this analysis, we hope to motivate multi-level investigations on the effect of women's status on child well-being in the United States.

Methods

Following the work of Kawachi et al. (1999) and McLeod et al. (2004) this study consists of an ecologic analysis of the relation between women's status and child well-being in the 50 United States. Complete data on women's status indicators and outcomes were not available for the District of Columbia, Puerto Rico and the US Virgin Islands and, therefore, they are not included in this analysis.

Outcome variables: child well-being indicators

All indicators of child health and well-being included in these analyses are from the year 2001, and were extracted from the Annie E. Casey Foundation KIDS COUNT data book (AECF, 2004). Outcomes included state-specific percent of children with low birthweight, infant mortality rate (deaths per 1000 live births), teen death rate from homicide, suicide, and accidents (deaths per 100,000 teenagers, aged 15–19), teen birth rate (births per 1000 females aged 15–17), and high school drop out rate (includes ages 16–19).

Predictor variables: women's status indices

The Institute for Women's Policy Research (IWPR) has developed composite indicators of women's status which are analyzed and reported on for each of the 50 states semi-annually. IWPR data were selected from the 2002 report, which reflect the years 1998–2000, so that our assessment of women's status would temporally precede that for child outcomes.

The women's status indicators reflect various domains of women's lives and include (1) political participation; (2) employment and earnings; (3) social and economic autonomy; and (4) reproductive rights (IWPR, 2002). IWPR's methodology for constructing women's status indicators is summarized below and in Table 1. For further detail on women's status indicator construction, refer to the full IWPR report (IWPR, 2002; <http://www.iwpr.org/states2002>).

Political participation

This indicator of women's status represents the power and control women have in the political arena at the state level and is composed of four parts: women's voter registration, women's voter turnout, women in elected office, and institutional resources available for women in the state. Each of the four component parts of the index was standardized by subtracting the mean national value from the observed state value, and dividing that difference by the United States standard deviation. Standardized scores were differentially weighted per component part: voter registration and turnout were weighted 1.0; women in elected office was weighted 4.0; and institutional resources was weighted 1.0. Women in elected office was weighted 4.0 because it was composed based on the propor-

Table 1
Women's status indicators, definitions and sources of data

Indicator	Definitions	Source
<i>Political participation index</i>		
Women's voter registration	Average proportion of women aged 18 and older who reported registering to vote for the presidential and congressional elections of 1998 and 2000. Weighted 1.0 in composite index.	IWPR (2002) ^a
Women's voter turnout	Average proportion of women aged 18 and older who reported voting in presidential and congressional elections of 1998 and 2000. Weight = 1.0.	IWPR (2002)
Women in elected office	Proportion of women holding political office as of April 2002 were calculated for four levels of government: (i) state representatives, (ii) state senators, (iii) statewide elected executive officials and US representatives, (iv) US senators, and governors. The observed proportions at each level for each state were divided by the highest value at that level for all states to give four scores ranging from 0 to 1. The four scores for each state were weighted by the degree of political influence associated with that position: state representatives weighted 1.0, state senators weighted 1.25, statewide elected executive officials and US representatives weighted 1.5, and US senators, and governors weighted 1.75. Weighted scores for each of the four components were added to give a total score for each state. Weight = 4.0.	IWPR (2002)
Women's institutional resources	Institutional resources include (a) state commission for women established by legislative order and (b) a legislative caucus for women which was organized by women legislators. States received 1 point for each of these institutional resources present in the state for a maximum score of 2.0. Weight = 1.0.	NACW (2000) ^b
		CAWP (1998) ^c IWPR (2002)
<i>Employment and earnings index</i>		
Women's median annual earnings	Median yearly earnings in 2000 dollars of noninstitutionalized women aged 16 and older who worked full-time year-round (more than 49 weeks per year, more than 34 h per week) in 1998, 1999, and 2000.	IWPR (2002)
Ratio of women's to men's earnings	Median yearly earnings in 2000 dollars of noninstitutionalized women aged 16 and older who worked full-time year-round (more than 49 weeks per year, more than 34 h per week) in 1998–2000, divided by median yearly earnings in 2000 dollars of noninstitutionalized men aged 16 and older who worked full-time, year-round (more than 49 weeks per year, more than 34 h per week) in 1998–2000.	IWPR (2002)
Women's labor force participation:	Proportion of the female population (civilian noninstitutionalized) aged 16 and older employed or looking for work in 2000.	IWPR (2002)
Women in managerial and professional occupations	Proportion of the female population (civilian noninstitutionalized) aged 16 and older employed in executive, administrative, managerial or professional specialty occupations in 1999.	IWPR (2002)
<i>Social and economic autonomy index</i>		
Women with health insurance	Proportion of women (civilian noninstitutionalized) aged 18 through 64 who had health insurance in 2000. Women were considered "uninsured" if they did not have insurance for the entire 2000 year. Weight = 1.0	IWPR (2002)
Women's educational attainment	Proportion of women in 1989 aged 25 and older with four or more years of college. Weight = 1.0.	IWPR (2002)
Women's business ownership	Proportion of firms owned by women in 1997. Weight = 1.0.	IWPR (2002)
Women above poverty	Proportion women living above the federal poverty level in 1998–2000. Weight = 4.0.	IWPR (2002)
<i>Reproductive rights index</i>		
Mandatory abortion consent/notification laws	Whether or not states allow minors access to abortion without parental consent or notification. States received a score of 1.0 if they allow minors to access to abortion without parental consent, and a score of 0 if parental notification or consent is required. Weight = 0.5.	NARAL (2002) ^d
		IWPR (2002)

Table 1 (continued)

Indicator	Definitions	Source
Abortion waiting period	Whether or not states allow women to have an abortion without a waiting period. States received a score of 1.0 if they allow a woman to have an abortion without a waiting period, and a score of 0 if there is a required waiting period. Weight = 0.5.	NARAL (2002) IWPR (2002)
Public funding for abortion	Whether or not states provide public funding for abortions for women who meet income eligibility standards under most circumstances. States that provide public funding for abortion received a score of 1.0. States that do not provide public funding received a score of 0. Weight = 1.0.	NARAL (2002) IWPR (2002)
Women living in counties with at least one abortion provider	The proportion of women living in counties with at least one abortion provider. Weight = 1.0.	IWPR (2002)
Pro-choice legislature or governor	Degree to which governors or legislatures would support a ban or restrictions on abortion. Each state received a score of 0.33 per pro-choice legal body (governor, upper house, lower house). Legal bodies with mixed support received a score of 0.5. The maximum score was 1.0. Weight = 1.0.	IWPR (2002) NARAL 2001
Contraceptive coverage laws	Whether states have policies that require health insurers who provide prescription drug coverage extend such coverage to include contraceptives and related services. States received scores of 1.0 if they required full contraceptive coverage, 0.5 if states required partial coverage, and 0.0 if the state required no coverage. Weight = 1.0.	IWPR (2002) IWPR (2002)
Coverage of infertility treatments	Whether or not states require insurance companies to provide infertility treatment coverage. States received a score of 1.0 if they required insurance companies to cover infertility treatments, and a score of 0 if the state does not have such a mandate. States were given a score of 0.5 if they required insurance companies to offer at least one package of infertility treatment coverage to policy holders. Weight = 0.5.	IWPR (2002) IWPR (2002)
Same sex couple adoption	Whether or not states allow same sex couples the option of second parent adoption (i.e. allowing a nonbiological parent in a couple to adopt the child with his/her partner). States received a score of 1.0 if the supreme court prohibits discrimination against same sex couples in adoption, a score of 0.75 if an appellate or high court has issued such a ruling, a score of 0.25 if the state has no official position on the issue, and a score of 0 if the state prohibits second parent same sex adoption. Weight = 0.5.	NCLR (2001) ^e
Mandatory sexual education	Whether or not states require public middle, junior, or high schools to provide sexual education classes. States receive a score of 1.0 if they require public schools to provide sexual education classes to middle, junior, or high school students, and a score of 0 if the state does not have such a requirement. Weight = 1.0.	IWPR (2002) AGI (2002) IWPR (2002)

Note: Further detail on construction of women's status indicators can be found at <http://www.iwpr.org/states2002/>.

^aInstitute for Women's Policy Research.

^bNational Association of Commissioners for Women.

^cCenter for American Women and Politics.

^dNational Abortion Rights Action League.

^eNational Center for Lesbian Rights.

tion of women in elected office at four levels of government (see Table 1). Weighted standardized scores were summed per state, resulting in the

composite political participation score. The higher the composite index score, the higher the level of women's political participation.

Employment and earnings

This indicator of women's status represents women's occupational and earning power at the state level and is composed of four parts: women's median annual earnings (in 2000 dollars), ratio of women's to men's earnings (in 2000 dollars), women's labor force participation, and representation of women in managerial and professional occupations. Each of the four component parts of the index was standardized by dividing the observed state-specific value by the total United States value. Each component part was equally weighted. Standardized scores were summed per state, resulting in the composite employment and earnings score. The higher the composite index score, the higher the level of women's employment and earnings.

Social and economic autonomy

This indicator of women's status represents women's social and economic power, and is composed of four parts: women's access to health insurance, women's educational attainment, women's business ownership, and women above poverty. Each of the four component parts of the index was standardized by dividing the observed state-specific value by the total United States value. Standardized scores were differentially weighted per component part: women's access to health insurance, educational attainment, and business ownership were weighted 1.0; and poverty was weighted 4.0. Weightings were based on the theorized relative importance of each component part to the construct of women's social and economic autonomy. Living above poverty was viewed as a fundamental prerequisite for autonomy and therefore more heavily weighted. Standardized scores were summed per state, resulting in the composite employment and earnings score. The higher the composite index score, the higher the level of women's social and economic autonomy.

Reproductive rights

This indicator of women's status represents women's control and power over reproductive health and rights, and is composed of nine parts: access to abortion services without mandatory parental consent, access to abortion services without a waiting period, public funding for abortions, women living in counties with at least one abortion provider, pro-choice governor or legislature, contraceptive coverage laws, coverage of infertility treatments, same-sex couple adoption, and mandatory

sex education for children in public schools. Each of the component parts was rated on a scale of 0–1, and assigned a weight. Mandatory parental consent, waiting period for abortion, coverage for infertility treatments, and same-sex couple adoption were weighted 0.5. Public funding for abortion, pro-choice government, women living in counties with at least one abortion provider, contraceptive coverage, and mandatory sex education were weighted 1.0. Component parts were weighted based on the degree to which they restrict women's reproductive rights. For example, public funding for abortion was weighted 1.0, whereas waiting period for abortion was weighted 0.5. Though both constructs are part of women's reproductive rights, a state that does not provide public funding for abortion has more restrictive implications for women's health (e.g. cannot obtain an abortion) than if a state mandates an abortion waiting period (e.g. can obtain an abortion, but must wait a short period of time). Weighted scores were summed per state, resulting in the reproductive rights composite score. The higher the composite index score, the higher the level of women's reproductive rights.

Covariates

Our goal in this paper was to examine whether women's status has an effect on child well-being after controlling for key compositional (e.g. proportion black and proportion Hispanic; see [McLeod et al., 2004](#)) and contextual variables (e.g. income inequality, see [Kawachi et al., 1999](#)) previously shown to impact child outcomes. Thus, selection of covariates included median family income, percentage of the state population living in poverty, income inequality, and racial compositions, operationalized as the proportion of the state population which is black or Hispanic. Median 2001 income of families with children was also included in these analyses. Median family income and percent poverty were extracted from the Annie E. Casey KIDSCOUNT data book ([AECF, 2004](#)). Percent poverty is defined as the proportion of state population who live in families with incomes below the federal poverty level, as defined by the US Office of Management and Budget. The federal poverty definition consists of a series of thresholds based on family size and composition. In 2000, the poverty threshold for a family of two adults and two children was \$17,463. Poverty status is not determined for people in military barracks, institutional quarters, or for unrelated individuals under age 18

(such as foster children). Income inequality was measured following Jun et al. (2004) as the ratio of incomes of the top and bottom 20% of families for 1998–2000 (Bernstein, McNichol, Mishel, & Zahradnik, 2000). Proportion black and proportion Hispanic were extracted from the US Census Bureau (Census, 2000, SF3, tables P6 & P7).

Statistical procedures

Correlational analyses were conducted to examine the association between women's status composite indices and covariates. Ordinary least squared regression models with robust standard errors were used to assess the effects of women's status on child outcomes. For each child well-being outcome and women's status indicator, three models were run. The first model was the univariate model; each outcome was regressed on women's status indicators without adjusting for covariates. The covariates included in the second and third models differed for each women's status indicator. For women's political participation and reproductive rights indices, the second model adjusted for median family income, income distribution, and percent poverty. We could not control for median family income, however, in analyses of women's employment and earnings because women's earnings were already included in the composite variable. Similarly, we could not control for median family income or percent poverty in analyses of women's economic and social autonomy because median income was highly collinear with women's level of education and percentage of women in poverty was included in the composite index variable. Thus, the second model for women's employment and earnings controlled only for income distribution and percent poverty. The second model for economic and social autonomy controlled only for income distribution. In all instances, the third model additionally controlled for state racial composition (proportion of black and proportion of Hispanic). For child outcomes that remained statistically significant ($p < .05$) in the third (fully adjusted) model, we followed up these analyses by running a series of models aimed at decomposing the child outcome—women's status indicator association.

Consistent with McLeod et al. (2004), infant mortality and teen death rates were coded as log-odds and correlations and regression models were weighted by the square root of the state population. Robust standard errors were used in OLS models to

give non-biased parameter estimates. Variance inflation factors were tested for each model. In all cases they were lower than 10, which is the usual level indicated as a cause for concern; the average VIF remained below 4 for all models.

Results

Descriptive statistics and correlations for women's status indices and covariates

Table 2 presents descriptive statistics and correlations for women's status indices, covariates, and child outcomes. The women's status indexes were moderately to highly correlated (range $r = 0.41$ – 0.85). Greater women's political participation at the state level was associated with a lower proportion of the state population being black. Greater women's reproductive rights at the state level were associated with a large proportion of the state population being Hispanic. The other women's status indices were not significantly correlated with either proportion black or proportion Hispanic. Higher scores on the employment and earnings index and the social and economic autonomy index were strongly associated with higher median family income and with lower percent poverty. Higher scores on the reproductive rights index were moderately associated with higher median family income. Income inequality was not significantly associated with any of the women's status indicators.

Better state-level women's status on all indicators was significantly associated with lower percent low birthweight and lower infant mortality. The association between teen outcomes and women's status indicators varied; teen mortality and birth rate were significantly associated with three out of four women's status indicators. High school drop out rate was significantly correlated with only women's social and economic autonomy. States with a relatively higher proportion of blacks had worse child outcomes, as did states with a lower median family income and poverty rates. The relation between proportion Hispanic and child outcomes was more complex. States with relatively larger Hispanic populations have better child outcomes in terms of proportion of low birth-rate babies, infant mortality, and teen death rate. However, states with a relatively large Hispanic population have worse child outcomes in terms of the high school drop out rate and teen birth rate. Income inequality was not

Table 2
Descriptive statistics and correlations among women's status indicators and covariates

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Political participation	1.0													
2. Employment and earnings	0.53***	1.0												
3. Social and economic autonomy	0.41**	0.85***	1.0											
4. Reproductive rights	0.50**	0.67***	0.53***	1.0										
5. Proportion black	-0.31*	-0.19	-0.30*	-0.19	1.0									
6. Proportion Hispanic	0.23	0.26	0.03	0.36*	-0.21	1.0								
7. Median Family Income (log)	0.28	0.71***	0.90***	0.38**	-0.20	-0.14	1.0							
8. Percent Poverty	-0.16	-0.55***	-0.80***	-0.21	0.34*	0.27	-0.88***	1.0						
9. Income Inequality (ratio)	0.01	0.03	-0.22	-0.24	0.25	0.46***	-0.30*	0.52***	1.0					
10. Percent low birthweight	-0.50***	-0.41**	-0.44**	-0.32*	0.83***	-0.25	-0.34*	0.41**	0.17	1.0				
11. Infant mortality (log-odds)	-0.39**	-0.47***	-0.45**	-0.49***	0.73***	-0.42**	-0.32*	0.32**	-0.09	0.73***	1.0			
12. Teen mortality (log-odds)	-0.25	-0.50***	-0.58***	-0.51***	0.37**	-0.20	-0.60***	0.46***	-0.21	0.49***	0.62***	1.0		
13. High school drop out rate	-0.12	-0.23	-0.40**	-0.09	0.22	0.32*	-0.57***	0.57***	0.27	0.34*	0.17*	0.54***	1.0	
14. Teen birth rate	-0.33*	-0.43**	-0.62***	-0.27	0.48***	0.38**	-0.70***	0.72***	0.28	0.55**	0.45**	0.64***	.72***	1.0
Mean	0.84	3.98	6.98	2.85	9.67	7.75	10.83	11.82	9.10	7.63	-2.16	-3.29	9.14	23.1
SD	4.17	0.25	0.33	1.70	9.52	8.92	0.17	3.22	1.16	1.23	0.09	0.11	2.47	7.55
Range	-6.55-10.8	3.5-4.57	6.3-7.63	0.18-6.75	0.24-36.17	0.65-42.09	10.50-11.18	5-20	7-12.8	5.5-10.7	-2.42 to -1.97	-3.54 to -3.12	4-16	10-39

* $p < 0.05$.
 ** $p < 0.01$.
 *** $p < 0.001$.

Table 3
Unstandardized regression coefficients for regressions of child well-being on women's political participation index ($N = 50$)

Outcome	Model 1			Model 2 ^a			Model 3 ^b		
	<i>B</i> (s.e.)	<i>p</i> <	<i>R</i> ²	<i>B</i> (s.e.)	<i>p</i> <	<i>R</i> ²	<i>B</i> (s.e.)	<i>p</i> <	<i>R</i> ²
Percent low birthweight	-0.13 (0.03)	0.001	0.25	-0.13 (0.03)	0.001	0.40	-0.06 (0.02)	0.001	0.78
Infant mortality (log-odds)	-0.008 (0.002)	0.003	0.15	-0.007 (0.002)	0.006	0.30	-0.002 (0.002)	0.33	0.71
Teen mortality (log-odds)	-0.006 (0.04)	0.14	0.06	-0.002 (0.003)	0.58	0.54	-0.001 (0.003)	0.64	0.65
HS Drop Out rate	-0.06 (0.08)	0.42	0.01	0.008 (0.06)	0.89	0.35	0.002 (0.08)	0.98	0.42
Teen birth rate	-0.54 (0.23)	0.02	0.11	-0.32 (0.13)	0.02	0.58	-0.27 (0.14)	0.05	0.82

^aModel 2 is adjusted for percent poverty, log of median family income, income inequality.

^bModel 3 is additionally adjusted for proportion of black and Hispanic.

Table 4
Unstandardized regression coefficients for regressions of child well-being on women's employment and earnings index ($N = 50$)

Outcome	Model 1			Model 2 ^a			Model 3 ^b		
	<i>B</i> (s.e.)	<i>p</i> <	<i>R</i> ²	<i>B</i> (s.e.)	<i>p</i> <	<i>R</i> ²	<i>B</i> (s.e.)	<i>p</i> <	<i>R</i> ²
Percent low birthweight	-2.01 (0.86)	0.03	0.17	-1.48 (1.26)	0.25	0.22	-1.19 (0.64)	0.07	0.76
Infant mortality (log-odds)	-0.17 (0.06)	0.003	0.22	-0.12 (0.07)	0.11	0.25	-0.08 (0.04)	0.03	0.72
Teen mortality (log-odds)	-0.23 (0.07)	0.001	0.25	-0.05 (0.07)	0.54	0.50	-0.03 (0.07)	0.60	0.58
HS drop out rate	-2.34 (1.32)	0.08	0.05	1.74 (2.05)	0.40	0.35	0.55 (1.96)	0.78	0.39
Teen birth rate	-13.30 (3.37)	0.001	0.18	0.60 (3.45)	0.86	0.55	-6.78 (3.23)	0.04	0.78

^aModel 2 is adjusted for percent poverty and income inequality.

^bModel 3 is additionally adjusted for proportion of black and Hispanic.

significantly associated with any of the child outcome measures.

Regression analyses for the association between women's status and child outcomes

Table 3 presents the results of the regression analyses for the association of women's political participation with child outcomes. The findings indicate that more women's political participation at the state-level is associated with a lower percentage of low birthweight babies, less infant mortality, and a lower teen birth rate in unadjusted (Model 1) analyses. This association remains significant after controlling for percent poverty, median family income, and income inequality (Model 2). The association between women's political participation and both percentage of low birthweight babies and teen birth rate continued to remain significant after additionally adjusting for proportion of black and Hispanic (Model 3). We then conducted follow-up analyses by regressing the percentage of low birthweight babies and the teen birth rate on the individual measures that make up

the composite political participation index, adjusting for poverty, median family income, income inequality, proportion black, and proportion Hispanic. More women in elected office was associated with a lower proportion of low birthweight babies ($B = -0.29$, s.e. = 0.10, $p = 0.005$). States with more institutional resources available for women had significantly lower teen birth rates ($B = -1.98$, s.e. = 0.93, $p = 0.04$). The remaining individual indices of women's political participation were not significantly associated with percentage of low birthweight babies or teen birth rate.¹

Table 4 presents the results of the regression analyses for the association of women's employment and earnings and child outcomes. The findings indicate that higher rankings on women's employment and earnings at the state level were

¹To test whether women's political participation was associated with child well-being over and above the effect of overall political participation, we reran Model 3 controlling for 2000 state-level voter turnout defined as the proportion of registered voters who voted in the 2000 election (see http://www.eac.gov/election_resources/00to.htm). Controlling for voter turnout had almost no effect on the results reported in Table 3.

associated with a lower percentage of low birthweight babies, less infant mortality, less teen mortality, and a lower teen birth rate in unadjusted (Model 1) analyses. These associations are not significant after controlling for percent poverty and income inequality (Model 2). However, the association of higher levels of women's employment and earnings with both lower infant mortality and teen birth rate was significant after additionally adjusting for proportion black and proportion Hispanic (Model 3). We then conducted follow-up analyses regressing infant mortality and the teen birth rate on the individual measures that make up the composite employment and earnings index and adjusting for percent poverty, income inequality, proportion black and proportion Hispanic. A greater percentage of women employed in managerial and professional positions was associated with a lower infant mortality rate ($B = -0.007$, $s.e. = 0.001$, $p = 0.002$) and with a lower teen birth rate ($B = -0.48$, $s.e. = 0.19$, $p = 0.02$). Higher median annual earnings for women were also associated with a lower teen birth rate ($B = -0.0008$, $s.e. = 0.0003$, $p = 0.02$). The remain-

ing individual indices of women's employment and earnings were not significantly associated with infant mortality or teen birth rate.

Table 5 presents the results of the regression analyses for the association of women's economic and social autonomy and child outcomes. The findings indicate that higher levels of women's economic and social autonomy at the state level are associated with a lower percentage of low birthweight babies, less infant mortality, lower teen mortality, a lower high school drop out rate, and a lower teen birth rate in unadjusted (Model 1) analyses. These associations remain highly significant after controlling for income inequality (Model 2) and after additionally adjusting for proportion black and proportion Hispanic (Model 3). We then conducted follow-up analyses regressing the percentage of low birthweight babies, infant mortality, teen mortality, high school drop out rate, and teen birth rate on the individual measures that make up the composite economic and social autonomy index and adjusting for income inequality, proportion black and proportion Hispanic. A greater percentage of women with access to health insurance was

Table 5

Unstandardized regression coefficients for regressions of child well-being on women's economic and social autonomy index ($N = 50$)

Outcome	Model 1			Model 2 ^a			Model 3 ^b		
	<i>B</i> (s.e.)	<i>p</i> <	<i>R</i> ²	<i>B</i> (s.e.)	<i>p</i> <	<i>R</i> ²	<i>B</i> (s.e.)	<i>p</i> <	<i>R</i> ²
Percent low birthweight	-1.61 (0.58)	0.008	0.20	-1.55 (0.58)	0.01	0.20	-0.81 (0.31)	0.01	0.74
Infant mortality (log-odds)	-0.12 (0.04)	0.003	0.20	-0.14 (0.04)	0.001	0.24	-0.08 (0.02)	0.001	0.71
Teen mortality (log-odds)	-0.20 (0.04)	0.001	0.34	-0.22 (0.04)	0.001	0.46	-0.20 (0.04)	0.001	0.55
HS drop out rate	-3.08 (1.04)	0.005	0.16	-2.75 (1.02)	0.01	0.19	-2.76 (0.98)	0.007	0.30
Teen birth rate	-14.61 (2.64)	0.001	0.39	-13.87 (2.65)	0.001	0.41	-12.79 (1.69)	0.001	0.75

^aModel 2 is adjusted for income inequality.

^bModel 3 is additionally adjusted for proportion black and Hispanic.

Table 6

Unstandardized regression coefficients for regressions of child well-being on women's reproductive rights index ($N = 50$)

Outcome	Model 1			Model 2 ^a			Model 3 ^b		
	<i>B</i> (s.e.)	<i>p</i> <	<i>R</i> ²	<i>B</i> (s.e.)	<i>p</i> <	<i>R</i> ²	<i>B</i> (s.e.)	<i>p</i> <	<i>R</i> ²
Percent low birthweight	-0.22 (0.11)	0.05	0.10	-0.23 (0.12)	0.05	0.25	-0.06 (0.08)	0.41	0.62
Infant mortality (log-odds)	-0.03 (0.01)	0.001	0.24	-0.02 (0.01)	0.001	0.32	-0.01 (0.004)	0.01	0.73
Teen mortality (log-odds)	-0.03 (0.01)	0.001	0.26	-0.01 (0.01)	0.08	0.57	-0.01 (0.01)	0.23	0.65
HS drop out rate	-0.13 (0.19)	0.51	0.01	0.17 (0.17)	0.32	0.36	0.10 (0.16)	0.55	0.42
Teen birth rate	-1.20 (0.57)	0.04	0.07	-0.26 (0.48)	0.60	0.55	-0.49 (0.33)	0.15	0.81

^aModel 2 is adjusted for percent poverty, log of median family income, income inequality.

^bModel 3 is additionally adjusted for proportion black and Hispanic.

associated with a lower infant mortality rate ($B = -0.005$, $s.e. = 0.002$, $p = 0.02$), a lower teen mortality rate ($B = -0.02$, $s.e. = 0.003$, $p < 0.001$), a lower high school drop out rate ($B = -0.23$, $s.e. = 0.07$, $p < 0.003$), and with a lower teen birth rate ($B = -0.79$, $s.e. = 0.18$, $p < 0.001$). A higher proportion of women with four or more years of college was associated with a lower percentage of low birthweight babies ($B = -0.07$, $s.e. = 0.03$, $p = 0.04$), a lower infant mortality rate ($B = -0.007$, $s.e. = 0.002$, $p < 0.001$), a lower teen mortality rate ($B = -0.02$, $s.e. = 0.004$, $p < 0.001$), a lower high school drop out rate ($B = -0.25$, $s.e. = 0.10$, $p = 0.02$), and a lower teen birth rate ($B = -1.14$, $s.e. = 0.18$, $p < 0.001$). A higher proportion of women living above poverty was associated with a lower percentage of low birthweight babies ($B = -0.10$, $s.e. = 0.04$, $p = 0.01$), a lower infant mortality rate ($B = -0.009$, $s.e. = 0.003$, $p = 0.002$), a lower teen mortality rate ($B = -0.03$, $s.e. = 0.005$, $p < 0.001$), a lower high school drop out rate ($B = -0.38$, $s.e. = 0.12$, $p = 0.004$), and a lower teen birth rate ($B = -1.15$, $s.e. = 0.28$, $p < 0.001$). The remaining individual indices of women's economic and social autonomy were not significantly associated with percentage of low birthweight babies, infant mortality, teen mortality, high school dropout rate, or teen birth rate.

Table 6 presents the results of the regression analyses for the association of women's reproductive rights and child outcomes. The findings indicate that higher levels of women's reproductive rights at the state level are associated with a lower percentage of low birthweight babies, less infant mortality, lower teen mortality, and a lower teen birth rate in unadjusted (Model 1) analyses. The associations between women's reproductive rights and the percentage of low birthweight babies and infant mortality remain significant after controlling for percent poverty, income inequality, and median

family income (Model 2). After additionally adjusting for proportion black and proportion Hispanic (Model 3), the association between greater reproductive rights for women and lower infant mortality remained significant. We then conducted follow-up analyses regressing infant mortality on the individual measures that make up the composite reproductive rights index and adjusting for percent poverty, income inequality, proportion black and proportion of Hispanic. States that did not require parental notification or consent for minor's access to abortion had significantly lower infant mortality rates ($B = -0.05$, $s.e. = 0.02$, $p = 0.02$) than states that required parental consent. The remaining individual indices of women's reproductive rights were not significantly associated with infant mortality rates.

Discussion

Our findings suggest a robust association between state-level women's status and child outcomes. Indices of women's status were significantly correlated with a range of child outcomes in unadjusted models. Moreover, several of these associations remained significant after controlling for both state-level income inequality and racial composition. Table 7 summarizes the significant associations between women's status indicators and child outcomes in the fully adjusted models. Women's status indicators were most consistently related to reproduction-related child outcomes: percent low birthweight, infant mortality rate, and teen birth rate. The associations between state-level women's status and teen mortality and the high school drop out rates were less consistent.

This pattern of results may reflect the fact that reproduction provides the most explicit connection between women's social status and child outcomes. During the perinatal period, the mother's status, specifically her access to adequate medical care,

Table 7
Statistically significant associations of women's status indicators with child well-being in fully adjusted models (Model 3)

	Percent low birthweight	Infant mortality	Teen mortality	High school drop out rate	Teen birth rate
Political participation	X				X
Employment and earnings		X			X
Social and economic autonomy	X	X	X	X	X
Reproductive rights		X			

nutrition, education, child care, maternal support groups and other community resources, are literally biologically incorporated by the infant. When the child becomes an adolescent, the mother's role in linking the child with the larger social structure may diminish and be replaced by the influence of peers and schools. Social contexts such as peers and schools may play a larger role in state-level teen mortality and high school drop out rates than state-level women's status. The exception to this pattern is the teen birth rate that, like the child outcomes, is related to reproduction and is likely directly connected to women's access to medical care, education, and contextual factors such as social norms around women's roles. Longitudinal multi-level investigations are needed to investigate these possibilities further.

Three findings deserve particular attention. The first was the significant association between higher women's status as measured by three of the four indices (employment and earnings, economic and social autonomy, and reproductive rights indices) and lower infant mortality. This finding is consistent with the well-documented association in developing countries between higher levels of education and better access to economic resources for women and lower infant mortality rates (World Bank, 2003). Although the infant mortality rate in the United States has declined greatly since 1965, in 2000, the United States ranked only 27th among industrialized countries on infant mortality rates; the United States rate was 6.9 deaths per 1000 live births. To put the United States infant mortality rate in an international context, it is of note that the United States infant mortality rate was, for example, worse than the rate for Canada (ranked 19th) which was 5.3 deaths, the rate for the Czech Republic (ranked 8th) which was 4.1 deaths, and the rate for Singapore (ranked 1st) which was 2.5 deaths per 1000 live births.

As of 2004, the rate of infant mortality in the United States remained unchanged at 6.9 per 1000 live births (US Department of Health and Human Services, 2004). Thus, infant mortality remains a major public health concern in the United States. The association between higher women's status and lower infant mortality may be explained by better access to resources, particularly health care, among women in states with higher rankings. When we examined the association between infant mortality and individual measures of women's status, states where a greater proportion of women were em-

ployed in managerial or professional occupations, had health insurance, and attended college and where a smaller proportion lived in poverty had lower infant mortality. In terms of reproductive rights, states that did not require parental consent for abortions had lower infant mortality rates. This association was independent of state-level indicators of wealth (median family income and percent poverty), income inequality, and racial composition.

The association between greater women's political participation and a lower percentage of low birthweight babies also merits comment. This association was independent of state-level indicators of wealth (median family income and percent poverty), income inequality, and racial composition. Low birthweight remains a public health concern as the percentage of babies born at low birthweight has risen since 1984. Children who are born low birthweight are at a disproportional risk of experiencing health, developmental, behavioral, and cognitive problems as they age (McCormick, McCarton, Brooks-Gunn, Belt, & Gross, 1998). States with more women in elected office had a lower proportion of low birthweight babies. This finding is particularly striking in that it remained highly significant when state racial composition was adjusted for in Model 3, as state-level racial composition predicted the proportion of low birthweight babies in previous work (McLeod et al., 2004).

A third finding of note was the consistent association between women's status indicators and lower teen birth rates. Better women's status as measured by the political participation, employment, and earnings, and economic and social autonomy indices were associated with lower teen birth rates after controlling for income inequality and state racial composition. Although teen birth rates in the United States have declined since 1991, teenage childbearing remains a significant public health concern (US Department of Health and Human Services, 2004). Motherhood before the age of 20 is associated with a host of negative outcomes for both young moms and their children (Moffitt & the E-risk Study Team, 2002). When we examined the association between teen birth rates and individual measures of women's status, states which made an institutional commitment to women, where a greater proportion of women were employed in managerial or professional occupations, had health insurance, and attended college and where a smaller proportion lived in poverty had teen birth rates.

Limitations

This study has a number of important limitations. The design is cross-sectional and, therefore, we can make neither temporal nor causal inferences. We used women's status indicators from the IWPR's 2002 report, which reflect the years 1998–2000, to insure that measures of women's status were taken prior to those of outcomes. Child outcomes were from the year 2001. Prospective studies would enable us to test whether changes in state-level policies that affect women's status lead to changes in child well-being. A second methodological limitation of this study is that it is ecologic. Individual-level inferences cannot be made as we have only tested the state-level association between women's status and child outcomes. Our analyses do not permit us to infer whether the United States children of individual women with less economic autonomy suffer poorer outcomes. However, studies in developing countries support such individual-level associations (e.g. IFPR, 2003; Quisumbing & Maluccio, 2003). We hope these findings will encourage multi-level analyses to examine the impact of women's status on child well-being at the individual level in the United States.

It is also possible that the significant associations between women's status indicators and child outcomes in this study are due to confounders. We attempted to address this issue by controlling for the major predictors of population health: income inequality and state racial composition. We additionally examined whether overall political participation, measured as voter turnout, accounted for the association between women's political participation and child outcomes. However, the possibility remains that there are other factors not accounted for in our analyses. In particular, the high correlation between women's social and economic autonomy and poverty likely accounts for some of the strong association of that specific women's status indicator and child outcomes. Future studies may wish to consider a wider range of possible confounders of the women's status–child outcome association. Finally, our study relies on composite indicators of women's status and does not examine the mechanisms by which women's status impacts child outcomes. Women's greater political participation may result in better funding for prenatal care programs for poor women, which then results in fewer low birthweight

infants. Such mechanisms can best be examined in longitudinal, multi-level studies.

Conclusions

Despite these methodological limitations, this study illustrates that the study of women's status and child well-being should not be limited to developing countries. Our findings extend those of Kawachi et al. (1999) to children, suggesting that the political, economic, and social power women exert at the state level may influence children's health. McLeod et al. (2004) reported that the association between income inequality and child outcomes was attenuated to non-significance after adjusting for state racial composition. In contrast, a number of the associations between women's status and child outcomes persisted after controlling for both income inequality and state racial composition. Women's status may represent an important, and understudied, social determinant of children's well-being in the United States.

These findings challenge the traditional political discourse that often frames policies protecting the welfare of children as in opposition to or in competition with those supporting women's economic, social, and reproductive rights. Nowhere is this more evident than in the debate over abortion rights: the women's "right to choose" versus the child's "right to life". Kawachi et al. (1999, p. 32) concluded: "Women's health and the formulation of effective strategies for improving women's status must thus be a central concern not only in feminist politics, but in broader campaigns for public health and social justice". We would like to echo those conclusions and suggest that policies aimed at raising the status of women in the United States may not only improve women's health and quality of life but have the added benefit of improving children's well-being.

Acknowledgment

Dr. Koenen is supported in part by US-NIMH K08 MH070627.

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