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THE STABILITY OF HOUSEHOLD PRODUCTION TECHNOLOGY: A REPLICATION

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Abstract

This paper reestimates underlying parameters of household production technology that are thought to constrain the choices of couples that influence the birthweight of their children, a proxy for child survival and health. Replication of such fundamental parameters from U.S. surveys of legitimate live births in 1967-69 and 1980 confirms the stability of this technology and also reveals the marked changes in demand for certain health inputs, such as smoking where the knowledge of the input's health effect has increased and appears to have diffused across women differentially by their education. While progress is reported in identifying the technical parameters of the production function for birthweight, the more difficult task of identifying and estimating the parameters describing agent's preferences remains to be accomplished.

An important measure of the success of a social science is its ability to predict behavioral outcomes under different circumstances. This ability requires that at least some attributes of agents that determine their behavior be stable and that such attributes be known by researchers. Measurement or estimation of agents' "fundamental" parameters, attributes invariant to changes in the environment, thus is of paramount importance and evidence on the stability of such parameters, an important test of their being fundamental, entails replication. The reestimation of the underlying, stable parameters influencing agents' behavior under different circumstances from comparable data taken from different environments, however, is rare in social science due to both data limitations and to the difficulty of measuring, estimating and/or identifying fundamental parameters.

In Rosenzweig and Schultz (1982, 1983), we made the claim that we had estimated the fundamental parameters describing the technology associated with birthweight, the technical-biological associations between certain parental choice variables or inputs and the weight of a child at its birth. We were, however, unable to discern the fundamental parameters describing parental preferences and presented estimates of first-order linear approximations of reduced form equations associated with the choice of birthweight inputs.

In this paper we report findings from a data set recently made available, the 1980 National Natality Followback Survey, that enables a replication of our previous investigations based on comparable data from 1967-69.[1] In this 12-year period, the environment faced by women of child-bearing age changed considerably. Among those changes was the accumulation and dissemination of findings on the hazards of smoking, including the printing of warning labels on cigarette packages. This change in the perceived cost of this good, found by us and many others to importantly diminish birthweight, represents a regime change

which should have resulted in different patterns of behavior although not necessarily in a shift in the basic birthweight technology. Indeed, the number of cigarettes smoked by pregnant mothers appears to have fallen by 20 percent over the period (see below).

Technology, even that associated with the biology and technology of birth outcomes, is not necessarily stable. The quality of inputs may change over time--for example, medical doctors may become more proficient at improving birth outcomes. Between 1967-69 and 1980, however, while there were evidently advances in agumenting the survival prospects of premature and/or low-weight infants, little progress has been made in affecting birthweight or gestation directly.[2] However, the increased information and its diffusion concerning the health costs of smoking has altered not only the quantity but the quality of cigarettes smoked, as the levels of tar and nicotine per cigarette smoked dropped by approximately 30 percent between 1968 and 1980 (FTC, 1981).

The environmental changes facing agents that took place between the two surveys make it unlikely that the reduced-form estimates taken from each survey, even if of the correct functional form, would be very similar. The hypothesized technology estimates, however, should be stable, although the parameters associated with the quantity of cigarettes smoked may embody the shift in cigarette quality--if tar and nicotine are in part responsible for the reduced weight of infants and if our specifications identify the fundamental technology of birthweight production, the <u>effect</u> of cigarettes smoked by pregnant women should have declined over the period.[3]

In Part 1, we briefly describe the prior data sets and the new data. Part 2 presents the new techology and reduced-form estimates along with the prior results, and Part 3 contains a summary and conclusions.

1. The Data

The National Natality Surveys for 1967, 1968 and 1969 used in our original studies were based on probability samples of legitimate births in those years and yielded, when combined, a working sample of 9621 births with information on the parents' education, income, maternal smoking behavior, delay of first prenatal care, as well as county of residence on which to match local county and state conditioning programs, price and labor force data. Non-white births were over-sampled; thus, such births are over-represented in the data by a factor of two.

The National Natality Survey (NNS) of 1980 is a merged file of information also collected from a random sample of U.S. birth certificates plus questionnaire responses from the mother, the hospital where the birth occurred, and the physician attendant at delivery. From these data, a working sample of 7669 legitimate births with the requisite information was obtained. The 1980 NNS was drawn by over-sampling (4.0 to 1.0) from the strata of births under 2500 grams, with the objective of better understanding the determinants of low birthweight. If we neglected the weighting of the sample by the dependent variable, our analysis would yield biased and inconsistent estimates. We have, thus, repeated observations on births over 2500 grams four times, to create a self weighting sample, and reduced the number of degrees of freedom in statistical tests to the original sample size.

From information provided on the county or county-group of mother's residence in the 1980 NNS, variables similar to those used in the analyses of the 1967-69 data were appended to the individual data to describe the county or county group. These variables included the characteristics of local medical and family planning infrastructure, medical personnel, public expenditures, composition of employment and unemployment, and local prices of cigarettes and alcohol (see Appendix Table A for a list of the local area variables used in the

1980 replication and Rosenzweig and Schultz (1983) for a description of those area-level variables in the original studies).

2. Estimates

a. Technology

Table 1 reports both ordinary least squares (OLS) and two-stage least squares (TSLS) estimates of the Cobb-Douglas and linear specifications of the birthweight production function as estimated from the combined 1967, 1968 and 1969 National Natality Surveys (NNS), and reported, respectively in Rosenzweig and Schultz (1983) and Rosenzweig and Schultz (1982), and from the 1980 NNS. The mean characteristics of these samples of legitimate live births are not very different. The mean birth order of children born in the survey years fell 20 percent, from 2.54 to 2.02, and the mean age of the mothers increased by one year, from 24.9 years in 1967-69, during this period, reflecting the temporal patterns of lower family size and birth postponement. Cigarette smoking also decined, as noted, by 20 percent among married women who delivered a live birth. However, the timing of prenatal care by the average mother hardly differs across surveys.

The birthweight production function point estimates from 1967-69 and 1980 for comparable estimation procedures and specifications are similar in magnitude and in precision. Indeed, the only two-stage least squares coefficient changing in a similar way in both specifications of the technology is that for smoking. In the earlier studies (Rosenzweig and Schultz (1982, 1983)), the self-selection of early prenatal care under adverse conditions was attributed a role in explaining why delay in receiving prenatal care had no direct association (OLS estimates) with birthweight, whereas the consistent two-stage least squares estimates of the consequence of postponing medical care for birthweight were negative and statistically significant. Women with health problems who

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Table 1

Birthweight Production Function Estimates in the United States: 1967-69 and 1980

	1967-69 National Natality Surveys					1980 National Natality Survey				
	Means (Standard	Cobb-Douglas[a]		Linear[b]		Means (Standard	Cobb-Douglas[a]		Linear[b]	
Explanatory Variables	Deviation)	OLS	TSLS	OLS	TSLS	Deviation)	OLS	TSLS	OLS	TSLS
Delay seeing doctor (months into pregnancy)	2.74 (1.55)	-.00178 (0.41)	-.0680 (2.82)	-1.56 (0.42)	-39.6 (1.71)	2.63 (1.85)	-.00160 (0.60)	-.0617 (3.07)	-4.23 (1.61)	-91.4 (4.89)
Smoking while pregnant (cigarettes per day)	4.71 (8.64)	-.0241 (13.9)	-.0256 (2.08)	-10.1 (15.4)	-16.2 (3.49)	3.76 (7.66)	-.0261 (24.0)	-.0105 (1.54)	-11.1 (24.3)	-7.99 (2.50)
Number of live births including current one	2.54 (1.90)	.0217 (4.88)	.0413 (2.09)	20.9 (5.34)	43.3 (2.31)	2.02 (1.20)	.0146 (5.42)	.0223 (1.71)	18.1 5.49	46.1 (2.84)
Age of mother at birth	24.9 (5.61)	.0125 (0.98)	.0202 (0.48)	3.58 (2.79)	1.83 (0.38)	25.9 (4.89)	.00696 (0.94)	.0760 (2.54)	2.08 (2.59)	4.65 (1.37)
Black	.190 (.392)	-.0806 (15.7)	-.0815 (10.2)	-252 (16.8)	-257 (11.1)	.0820 (.274)	-.0843 (18.5)	-.0788 (14.8)	-247 (19.3)	-234 (14.7)
Intercept	--- ---	8.06 (199)	8.21 (56.5)	3263 (95.0)	3360 (24.0)	--- ---	8.11 (339)	7.92 (73.7)	3386 (154)	3477 (29.9)
R^2	---	.044	---	.053	---	---	.035	---	.037	---
F	---	89.5	42.7	54.8	29.5	---	186.0	80.6	195.5	87.7
Mean birthweight (Standard deviation)	3288 (568)	--- ---	--- ---	--- ---	--- ---	3394 (571)	--- ---	--- ---	--- ---	--- ---
Sample size	9621	---	---	---	---	7669	---	---	---	---

Note - Absolute value of t-ratios beneath coefficients.

a. Results reported in Rosenzweig and Schultz (1983); dependent and independent variables in log form.

b. Results reported in Rosenzweig and Schultz (1982).

subsequently had babies of low birthweight apparently sought prenatal care earlier in their pregnancies to compensate for this condition. This adverse selection bias, (reflected in the relative magnitudes of the OLS and TSLS doctor delay coefficients) is also evident in the 1980 estimates. Estimates from both surveys also indicate that, for given inputs, birthweight among blacks is about 8 percent lower than that among whites, or about 230-250 grams lighter. The statistically significant coefficients associated with parity have also remained stable--the 1967-69 linear estimates suggest that an increase in birth order of two children results in an increase in birthweight of 87 grams; the comparable estimated increase from the 1980 survey is 92 grams.

The relative stability of the statistically significant (as of 1967-69) TSLS input coefficients other than those for smoking across at least one of the specifications suggests that the reduction in the statistically significant TSLS smoking coefficient across surveys may reflect the shift among smokers to less unhealthy cigarettes and/or to less intensive smoking habits. Smoking continues, however, to have substantial effects; the 1980 TSLS Cobb-Douglas estimate suggests that the one-fourth of the 1980 sample of mothers who smoked while pregnant (i.e., (3.8 x 4) cig/day x -.011) could expect on average to have an infant weighing about 15 percent less than would non-smokers.

The TSLS Cobb-Douglas coefficients from the two samples also imply that had the mean quantity of cigarettes smoked by pregnant mothers and all other inputs remained the same over the 1969-1980 period, the change in smoking intensity alone would have increased mean birthweight by 7.1 percent. The actual reduction in the quantity of cigarettes smoked during pregnancy of approximately one cigarette per day, with no change in the quality of the smoking inputs, however, would have increased birthweight by 2.6 percent. The combined shifts in smoking behavior on the part of pregnant women thus would

have increased birthweight by almost 10 percent had there been no offsetting other changes. However, the reduction in the mean parity of children born between the two survey years appears to have almost exactly offset the benefits of reduced smoking. The fall in fertility, the decline in smoking and the lack of change in the rapidity with which mother's seek medical care thus appears to "account for" the stability in birthweight over the period 1967-69 through 1980, based on our combined estimates.

b. Reduced Forms

Table 2 displays the reduced form coefficient estimates of the associations between the parental schooling and husband's income variables and birthweight and the birthweight inputs obtained from the two surveys.[4] The third and fourth columns provide the estimates for (the log of) birthweight. As would be expected given at least one "regime" change over the 12-year period 1968-1980, the birthweight reduced form estimates do not appear to come from the same underlying structure. In particular, for the 3 top (of 4) mother's schooling categories, the statistically significant 1980 coefficients are from 2 to 7 times larger than their 1967-69 counterparts. Moreover, birthweight differences by the schooling of mothers appear to be more pronounced in the more recent period among mothers with 12 years or more of schooling (82 percent of all mothers in 1980). Income differences in birthweight, however, appear to be similar and small in both periods--a doubling of husband's income is associated with just under a 1 percent differental in birthweight--and differences by husband's schooling, ceteris paribus, are not statistically significant in either period.[5]

Of the sets of reduced form coefficients in the equations determining birthweight inputs, that for smoking appears to be the most altered between the survey years. Indeed, all other pairs of equation estimates from the two surveys appear remarkably similar. In the smoking equations, however, the

Table 2

Reduced Form Demand Equation Estimates: 1967-1969 and 1980

	Means		Log of Birth Weight		Log of Doctor Delay		Log of Smoking		Log of Births		Log of Mother's Age	
Explanatory Variables	1967-69[a]	1980	1967-69[a]	1980	1967-69[a]	1980	1967-69[a]	1980	1967-69[a]	1980	1967-69[a]	1980
Mother's schooling												
High school incomplete	.229	.133	-0.0109	-.000757	-.0914	-.0467	.201	.306	-.185	-.205	-.0813	-.0959
			(1.23)	(0.10)	(4.46)	(2.61)	(3.91)	(7.02)	(7.33)	(10.3)	(9.59)	(14.6)
High school complete	.445	.448	.00392	.0285	-.215	-.160	-.0585	-.168	-.300	-.285	-.0005	-.0007
			(0.44)	(3.78)	(10.5)	(9.34)	(1.14)	(4.02)	(10.9)	(15.0)	(0.02)	(0.11)
College incomplete	.143	.210	.00916	.0377	-.259	-.163	-.0900	-.304	-.380	-.336	.0148	.0346
			(0.86)	(4.71)	(10.5)	(8.97)	(1.46)	(6.88)	(12.6)	(16.7)	(1.45)	(5.17)
College complete +	.088	.172	.0135	.0256	-.257	-.191	-.145	-.530	-.447	-.377	.0797	.0931
			(1.08)	(3.06)	(8.92)	(10.1)	(2.01)	(11.5)	(12.6)	(17.9)	(6.69)	(13.3)
Father's schooling												
High school incomplete	.191	.119	-.00760	-.00781	-.0115	-.00741	.192	.328	-.272	-.171	-.114	-.0921
			(0.86)	(1.01)	(0.60)	(0.42)	(3.99)	(7.64)	(11.5)	(8.75)	(14.3)	(14.2)
High school complete	.378	.397	-.00989	-.00638	-.099	-.0930	.0441	.158	-.355	-.201	-.114	-.0701
			(1.21)	(0.86)	(5.23)	(5.53)	(0.93)	(3.85)	(15.3)	(10.7)	(14.6)	(11.3)
College incomplete	.146	.200	-.00350	-.00101	-.116	-.139	-.0366	.123	-.387	-.181	-.121	-.0329
			(0.36)	(0.13)	(5.14)	(7.84)	(0.64)	(2.85)	(13.9)	(9.15)	(12.9)	(5.03)
College complete +	.159	.244	-0.144	.0155	-.149	-.144	-.0463	.0233	-.252	-.161	-.0473	.0120
			(1.33)	(1.93)	(5.95)	(7.89)	(0.08)	(0.52)	(8.53)	(7.95)	(4.57)	(1.79)
Log of husband's life-cycle income	8.65	9.56	.00989	.00944	-.0790	-.0290	.0667	-.0403	.0640	.0114	.0107	.00658
	(0.725)	(0.699)	(2.67)	(4.88)	(9.30)	(6.59)	(3.12)	(3.77)	(6.10)	(2.34)	(3.01)	(4.07)

Note - Absolute value of t-ratios in parentheses beneath coefficients.

a. Results reported in Rosenzweig and Schultz (1983).

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Note - Absolute value of t-ratios in parentheses beneath coefficients.

a. Results reported in Rosenzweig and Schultz (1983).

mother's schooling coefficients, for mothers with at least 12 years of schooling, are higher in the 1980 period by a factor of 2.5 and those coefficients associated with the husband's schooling below the college degree category increased by from 33 to 300 percent between surveys. The increased differentiation in smoking habits among pregnant mothers by parental schooling attainment betweeen 1967-69 and 1980 is consistent with the hypothesis that information about the health consequences of smoking, not an important factor in the 1967-69 period, is differentially assimilated or valued by couples with different schooling levels in 1980.[6]

The change in the perceived character of smoking from that of a normal good to a good negatively affecting health is also reflected in the sign reversal in the husband's income coefficients between the two periods, the only sign reversal in all of the reduced form comparisons involving statistically significant coefficients. In 1967-69, mothers with higher income husbands smoked significantly more cigarettes while pregnant; in 1980, higher husbands' income is associated with significantly fewer cigarettes smoked by the mother during pregnancy. Health is not only a non-inferior commodity, but appears to have a more positive income elasticity than does the pleasure of smoking.

3. Conclusion

In this paper we have examined the stability of the parameters characterizing one aspect of the hypothesized technology of the household by reestimating such parameters from a more recent data set. We compared, as well, estimates of reduced-form coefficients for inputs and outcomes from two time periods. Two-stage least squares estimates of the technology, which take into account input selection bias, appeared to yield stable estimates of the technological production function for birthweight in the United States, to capture the induced shift in the quality of one of the inputs, cigarettes, that

has occurred in the interval between survey years, and to successfully track the change (or lack of it) in mean birthweight over the 12 year interval associated with the demand for inputs.

In contrast, but consistent with the change in the information set concerning the health effects of smoking available (differentially) to agents across the survey intervals, there were significant alterations in the estimated coefficients associated with both the reduced-form birthweight and maternal smoking equations. These latter shifts, while not unanticipated, indicate that while we may have made progress in identifying household technological attributes, the more difficult task of identifying and measuring those parameters characterizing agents' preferences remains to be accomplished.

Footnotes

*This research, as were the prior studies replicated here, was supported by a grant from the NICHD Center for Population Research, HD12172.

1. It could be argued that social science would be better served if we did not undertake a replication of our own work. However, even after waiting a decent interval of time, no one appears to have displayed any interest in such an undertaking. Whether this reflects the lack of importance of the issues, information barriers concerning data availability, and/or low private returns to replication are questions we do not pursue.

2. Infant mortality in the United States was 26 per thousand live births in 1960, 20 in 1970 and 12.6 in 1980. Thus it fell by half in two decades and by one-third in the 1970s. The percentage of U.S. births under 2500 grams, or low birthweight, increased slightly from 1960 to 1970, from 7.7 percent to 7.9 percent and fell to 6.8 by 1980. This decline of about one-tenth in the share of low birthweight infants suggests the improving infant mortality occurred widely within birthweight classes (U.S. Bureau of the Census, 1984).

3. Of course, had we been able to measure from the original data sets as well as from the 1980 data the tar and nicotine content of the cigarettes smoked, we would have expected no change in parameters.

4. For brevity, we only report those reduced form estimates for the analysis of the Cobb-Douglas form of the technology, as estimated in Rosenzweig and Schultz (1983). The linear specification results are qualitatively identical.

5. The similarity of the income coefficients across time-periods is somewhat misleading, as the measure of income used is based on an estimated log "earnings function" in order to standardize income for life-cycle effects (see Footnote 9 in Rosenzweig and Schultz (1983)). The coefficients, estimated with high precision from both surveys, appear to differ greatly. For example, the

coefficient (t-value) on schooling was .178 (48.6) in 1967-69 and is .091 (29.8) in 1980. It is well known, of course, that the parameters of the standard log-linear earnings function describe an equilibrium relationship in the economy (Mincer (1974), Rosen (1974), Tinbergen (1956)). They do not uniquely correspond to the fundamental parameters characterizing the technology associated with the production of human capital by heterogeneous individuals; the technology describing the relationship between human capital, other productive inputs and outputs in the aggregate economy or among heterogeneous firms, or preference attributes of consumers, which determine the skill-intensity of final outputs and labor supply.

6. Farrell and Fuchs (1982) found a tripling of the effect of women's schooling attainment on smoking between two cohorts of women corresponding approximately to the women in the two NNS surveys, although they found that the effect for men occurred earlier.

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Appendix Table A
Instrumental Variables, Data Sources and Sample Statistics

Variable Definition	Data Source	Sample Mean[a] (Standard Deviation)
Medical Services Available: County		
Physicians per capita 1980 ($x10^3$)	Co-stat-1	1.14 (1.44)
OB/GYN per capita 1975 ($x10^3$)	AGI	.275 (.155)
General Practitioner per capita 1975 ($x10^3$)	AGI	.874 (.316)
Hospital family planning clinics per capita 1980 ($x10^5$)	AGI	.713 (.181)
Health Dept. family planning clinics per capita 1980 ($x10^5$)	AGI	.603 (.905)
Planned Parenthood clinics per capita 1980 ($x10^5$)	AGI	.145 (.313)
Other family planning clinics per capita ($x10^5$)	AGI	.0903 (.366)
Government Programs: County		
Expenditures per capita on Hospitals 1980	Co-stat-1	.334 (.122)
Expenditures per capita on Education 1980	Co-stat-1	.0519 (.0557)
Hospital beds per capita 1980	Co-stat-1	.00831 (.0163)
AFDC maximum monthly benefits for family of four ($)	Urban	298. (111.)
Food stamps bonus potential if only income is AFDC per family of four ($)	Urban	84.3 (31.7)
Labor market: County		
Employment share in Agriculture	Co-stat-1	.0474 (.0552)
Employment share in Construction	Co-stat-1	.0606 (.0202)
Employment share in Manufacturing	Co-stat-1	.222 (.0903)
Employment share in Transportation	Co-stat-1	.0724 (.0177)
Employment share in Wholesale/Retail Trade	Co-stat-1	.205 (.0235)
Employment share in Financial Services	Co-stat-1	.0582 (.0217)
Employment share in Educational Services	Co-stat-1	.0861 (.0245)

Employment share in Business Services	Co-stat-1	.0402 (.0142)
Employment share in Entertainment	Co-stat-1	.0415 (.0195)
Employment share in Health Services	Co-stat-1	.0734 (.0170)
Employment share in Public Administration	Co-stat-1	.0524 (.0318)
Urban share of Population	Co-stat-1	.725 (.262)
Unemployment Rate for Females in 1980 (%)	Co-stat-1	6.63 (2.28)
Unemployment Rate for Males in 1980 (%)	Co-stat-1	6.61 (2.60)
Prices, Taxes, Regulations: State		
Alcohol state monopoly	Facts	.309 (.462)
Tax on gallon of wine ($)	Facts	.552 (.579)
Cigarette price/pk. 1974 (¢)	Tobacco	45.5 (4.92)
Cigarette price/pk. 1979 (¢)	Tobacco	60.4 (4.81)
Cigarette sales tax/carton 1974 (¢)	Tobacco	9.48 (7.96)
Cigarette sales tax/carton 1979 (¢)	Tobacco	13.6 (10.7)
Beer average Jan. and July price 1976 (6 pk)	Ornstein	1.80 (1.89)
Beer average Jan. and July price 1979 (6 pk)	Ornstein	2.06 (.221)
Liquor 8 brand average price 1976 (fifth)	Ornstein	6.59 (.532)
Liquor 8 brand average price 1979 (fifth)	Ornstein	6.96 (.588)
Ethnic and Racial Origin: Individual		
Mother race Asian	NNS/MQ	.0268 (.161)
Mother race Black	NNS/MQ	.0781 (.268)
Mother origin Irish	NNS/MQ	.308 (.461)
Mother origin Puerto Rican	NNS/MQ	.00941 (.0966)
Mother origin Cuban	NNS/MQ	.00182 (.0426)
Mother origin Mexican	NNS/MQ	.0453 (.208)
Father race Asian	NNS/MQ	.0258 (.159)

Father origin Irish	NNS/MQ	.233 (.423)
Father origin Puerto Rican	NNS/MQ	.00903 (.0945)
Father origin Cuban	NNS/MQ	.00194 (.0440)
Father origin Mexican	NNS/MQ	.0418 (.200)
Child race Black	NNS/BC	.0818 (.274)
Mother origin all Hispanic countries (including other Spanish)	NNS/MQ	.0713 (.257)
Personal Characteristics: Individual		
Mother's education (years)	NNS/MQ	12.7 (2.31)
Father's education (years)	NNS/MQ	13.0 (2.53)
Father's income ($/year)	NNS/MQ	15,814. (8817.)
Father's height (inches)	NNS/MQ	69.9 (6.31)
Father's weight (pounds)	NNS/MQ	174. (28.8)

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[a]Sample weighted, with births of less than 2500 grams given one fourth the weight, since they were selected four times as frequently as births greater or equal to 2500 grams.

Data sources codes:

Co-stat-1: U.S. Bureau of the Census, Washington, D.C., County Statistics file, 1984.

AGI: Alan Guttmacher Institute TT0519, 1-2 July 1985. Personal Correspondence Stanley Henshaw.

Tobacco: The Tax Burden on Tobacco, The Tobacco Institute, Washington, D.C., 1983.

Ornstein: Stanley I. Ornstein, UCLA. Personal correspondence, June 1985, and Professor Michael Grossman, NBER/CUNY Graduate Center.

Facts: 1980 Facts and Figures, The Tax Foundation, 1980. Table 200.

Urban: Toby Campbell and Marc Bendeck, A Public Assistance Data Book, Urban Institute, Washington, D.C., October 1977. yExhibit 31A, p. 105.

NNS: National Natality Survey 1980; MQ--Mother's Questionnaire; BC--Birth Certificate; H--Hospital Questionnaire.