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THE CHOICE OF DIET FOR YOUNG CHILDREN AND ITS RELATION TO CHILDREN'S GROWTH

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Abstract

In this paper we analyze the choice of diet for young children in low income families in the United States and its relation to the children's growth. Our most important finding is that the education and income levels in low income households are generally sufficient for the provision of adequate diets for children in the household. This conclusion is based on empirical results which show that low income parents have pushed the growth of their children through choice of diet nearly as much as possible, and which also show that mother's education and family income are insignificant determinants of the nutrient intakes of children in low income households.

I. Introduction

Interest in the nutritional status of young American children has heightened considerably in the last decade. Much of the concern has resulted from research suggesting varying degrees of undernutrition in low income American school and pre-school children[1] and from evidence that intellectual development can be permanently impaired if diets are deficient in the first year or two of life.[2] Undernourishment is not the only potential nutrition problem for young children. Overnourishment in the first year of life may permanently increase the number of adipose (fat) cells and, thus, substantially increase the probability of obesity in adult life, the primary health problem in the United States today.[3]

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[1]For examples of research into the problem of undernutrition in American school and pre-school children in the U.S., see Christakis (1968), Owen (1969), Sims and Morris (1974), and Owen (1974).

[2]A brain "growth spurt" occurs in the first two years of life during which the interneural network is created. Deficient diets at this time can slow this spurt and permanently retard intellectual development [Lewin (1975)]. Owen (1977), in his recent review of the effects of nutrition on growth and cognitive development, concludes that the "evidence, which still should be considered preliminary in nature, ... [indicates] that bigger is smarter, at least among pre-school children."

[3]Hirsh and Knittle (1970), and Hirsh (1972) have argued that adipose (fat) cells are primarily developed early in life and that once in existence the number of these cells cannot be decreased, although their fat content can be lowered. Apparently it is during the last portion of the gestation period and during the child's first year that the majority of fat cells develop. From his study of obese children, Brook (1972) concludes that overnourishment in the first nine months to one year of life permanently increases the number of adipose cells and, thus, is an important cause of obesity in later life. Eid (1970) and Huenemann (1974) provide supporting evidence. They show that rapid weight gain in the first few months of life correlates with obesity in later years.

In this paper we analyze the household's choice of diet for its young children (0-36 months) and its relation to the children's growth. We are particularly interested in the extent to which family income and education of the mother are obstacles to the provision of adequate diets for children in poor American families. The hypothesis that these obstacles are substantial underlies many government programs.[4]

This paper is divided into five sections. In the following section we describe the conceptual framework and specify an econometric model of children's diet and growth. This is followed by a discussion of the data that includes important descriptive statistics. In Section IV, we present the estimated model. Finally, we consider the implications of the research.

II. Conceptual Framework

As a point of departure we postulate that the utility of parents is a positive function of their children's growth. That is, within the bounds of perceived norms, parents desire heavier and taller children. For our analysis it is not necessary that this desire be based on the known correlations between current period height and weight of children and their current and future period health status and intellectual development. Rather, we only argue that this desire does

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[4] In 1969, Charles Upton Lowe, the director of the National Institute of Child Health and Development, told Congress: "One out of every three children under 6 years of age are living in homes in which incomes are insufficient to meet the costs of procuring many of the essentials of life, particularly food" (Chase, 1977).

exist and that parents make sacrifices or forego other pleasures in order to augment the growth of their children.[5]

Although constrained by genetic and physiological factors, parents influence the growth of their children by their choice of diet for the children and by their investment in their children's health (medical care, parental care, sanitary conditions, etc.). The interdependencies among children's growth, children's health and their diet are formalized in the following model.

We begin by relating the parent's choice of the initial diet, D_o, for a new born to birth weight, BW, which is a proxy for the infant's demand for food,[6] and initial period socioeconomic influences, E_o, that impact on the quantity and quality of diet.

$$D_o = f^o(BW, E_o) \quad . \tag{1}$$

In each subsequent period the child's growth, G_t, is determined by genetic and parental traits, Z, and by diet, D_{t-1}, and health status, H_{t-1}, in the preceding period. Health status can be interpreted as an

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[5]It is often pointed out that in agricultural societies parents are very concerned about the size of their children because physical strength is an important correlate of individual output. Although a desire for larger children in modern societies may not be based on a similar observation, it is true that the height or weight of children at younger ages correlate with their intellectual development (see note 2) and health in later years, and thus with their future earnings.

[6]Birth weight can also be viewed as a measure of the new born's ability to consume nutrients. Very light babies can lack the physical strength necessary to nurse.

efficiency parameter that affects the rate at which nutrients are converted into children's growth. Formally,

$$G_t = f(Z, D_{t-1}, H_{t-1}) \quad . \tag{2}$$

The diet in each period is a function of the child's growth, which serves as a proxy for appetite or the child's demand for food, and the socioeconomic status of the household.

$$D_t = g(G_t, E_t) \quad . \tag{3}$$

The child's health status is a function of his diet, growth and other inputs which produce good health, X_t,

$$H_t = h(X_t, G_t, D_t) \quad . \tag{4}$$

The levels of X_t are determined by socioeconomic status:

$$X_t = e(E_t) \quad . \tag{5}$$

In order to statistically identify certain key relationships and to make the model consistent with available cross-section data, several assumptions are necessary, some of which are explicit in equations 1-5. First, birth weight is considered exogenous to our model of children's growth, diet and health. A more sophisticated model could include birth weight as an endogenous variable and relate it to parental characteristics, diet of the mother and socioeconomic variables.[7] We also assume that some variables are serially correlated (e.g., diet, household income) or constant (e.g., mother's education, parental traits) over t and that the time increments are infinitesimal.

To isolate the role of diet as a bridge from socioeconomic status to children's growth, we can, given the assumptions detailed above, derive the following simultaneous equations from (2), (3), and (5):

$$G = g(\hat{D}, \hat{H}, t, Z, BW) \qquad (6)$$

$$D = f(\hat{G}, E) \qquad (7)$$

$$H = h(\hat{D}, \hat{G}, E) \qquad (8)$$

which specifies D, G, and H as endogenous variables. Equation (6) is basically a technical relationship, describing how children's growth responds to diet and health levels, given age, birth weight and parental and genetic characteristics. Equations (7) and (8) are primarily behavioral relationships, explaining the choice of diet in the household for the children, given socioeconomic constraints, and the subsequent influence of diet and growth on health levels.

At the empirical level we have estimated several variations of this model of children's diet, health, and growth. The model most consistent with the conceptual framework consisted of seven equations with

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[7] Hammonds argues that the fetus is protected from environmental effects, including moderate maternal malnutrition (Hammonds,). This view implies that nutrient intakes of the mother and socioeconomic variables could be removed from a birth weight equation. New evidence on this theory is presented in Section IV-C.

seven endogenous variables. The endogenous variables were two measures of children's nutrient intakes--daily calorie and daily protein consumption; three measures of children's growth--height, weight, and head circumference; and two measures of children's health--the lifetime number of cases of pneumonia and the number of cases of diarrhea in the six months prior to the clinical history. The health variables, however, did not approach statistical significance in the growth equations, apparently because they had minor or very short-term effects on children's growth that were rapidly overcome. In the presentation of the empirical results, therefore, we emphasize a model of children's diet and growth that has excluded the health variables and health equations. In this model the exogenous variables in the growth equations are measures of genetic and parental traits, namely children's age, sex, birth weight, race and mother's height. Exogenous variables in the nutrient intake equations are family income, family size, mother's education, and dummy variables indicating whether the family resides in an urban area, whether the family receives food stamps, and whether the child is or was breast fed.

III. The Data

The data source for this study is the Ten State Nutrition Survey, 1968-70 (TSNS). In this survey, 30,000 families in ten states were selected from low income enumeration districts. Demographic data were obtained from 24,000 of the families by interview. Selected subgroups of infants and young children, adolescents, pregnant or lactating women, and persons over 60 years of age received detailed dietary and biochemical evaluations. Dietary intake data for the previous 24 hours were collected for children less than three years of age by interview of the homemaker. This sample was reduced to a working sample of roughly 500 children by deleting all observations (children) with missing data for those variables specified in our model and by deleting all children whose parents reported their age to be 12, 24, or 36 months. This latter procedure was undertaken because of the disproportionate number of responses in these age categories, many of which seemed random in nature. Those children deleted from the sample by this procedure do not differ significantly from those included.[8]

Descriptive statistics for some of the variables available in the TSNS which were identified in our conceptual framework as important to an analysis of children's diet and growth are presented in Table 1. Of immediate note are the mean values of the dietary intake and growth variables. Children in this predominantly low income sample had mean calorie intakes of 1,310 and mean protein intakes of 55 grams. The calorie figure is about equal to the recommended dietary allowance (RDA) for children of age 18 months, the average age in our sample. The protein intake figure is more than twice the RDA for children of 18 months. This pattern of average calorie and protein consumption in excess of RDA's remains whether the TSNS data is stratified by age, income, or ethnic group (see Table 2). It is also true that the average of the ratios

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[8] Protein and calorie intakes were slightly less for the deleted children and their height, head and weight growth was slightly greater when compared to age and sex specific national norms.

TABLE 1

Summary Statistics

Variable	Mean	Standard Deviation
Daily calories	1,310	653
Daily protein (grams)	55.34	29.80
Weight (kg)	10.56	2.94
Height (cm)	78.26	10.51
Head circumference (mm)	460.95	32.36
Family income	5,353	3,288
Mother's education	10.68	2.75
Family size	5.47	2.23
Race dummy (black = 1)	.27	.44
Food stamp dummy (recipient = 1)	.10	.30
Mother's height (cm)	160.41	6.59
Birth weight (oz)	115.55	20.77
Age	17.80	9.92
Breast fed dummy (child was (is) breast fed = 1)	.25	.43
Sex dummy (male = 1)	.51	.50
Urban dummy (urban location = 1)	.74	.44
Norm height	.98	.002
Norm weight	1.00	.007
Norm head	.99	.002

TABLE 2
Mean Protein and Calorie Intakes by Age, Income, and Ethnic Group, TSNS

	Calories	Percent Adequacy[a]	Protein	Percent Adequacy
	Age 6-11 Months, Low Income[b] States			
Ethnic Group				
White	1,123	127%	50.1	258%
Black	973	116	41.2	224
Spanish American	940	125	44.2	265
	Age 12-23 Months, Low Income States			
White	1,597	157	63.4	299
Black	1,131	117	48.1	237
Spanish American	1,348	138	63.0	303
	Age 24-36 Months, Low Income States			
White	1,485	135	57.9	266
Black	1,177	105	48.0	217
Spanish American	1,347	135	62.7	320
	Age 6-11 Months, High Income[a] States			
Ethnic Group				
White	1,038	121	49.2	259
Black	1,184	143	46.6	259
Spanish American	982	118	43.4	239
	Age 12-23 Months, High Income States			
White	1,394	141	58.3	279
Black	1,483	149	61.2	292
Spanish American	1,307	131	56.5	268
	Age 24-36 Months, High Income States			
White	1,555	135	60.2	265
Black	1,581	140	60.8	274
Spanish American	1,292	117	55.1	253

Footnotes to TABLE 2

Source: Health Services and Mental Health Administration, DHEW (HSM) 72-8133 (1972), pp. 12-13.

[a]Adequacy standards based on ratios of intakes to body weight.

[b]State classified as low (high) income if more (less) than one-half of sampled families below poverty line.

of height, weight and head growth to the relevant national norms (age and sex specific) average near unity in each case.[9] Thus the picture that emerges from a look at the sample means is one of adequate to more than adequate diets and normal growth and development for these children from relatively poor families in the United States.

The ratios of height and head growth to national norms are particularly noteworthy statistics. If we assume that in the U.S. diets and health levels on average are sufficient to insure that height and head growth of children reach the limits of their physiological potential,[10] then the means of unity in the TSNS sample for the height and head growth norms imply that these children are also near their physiological potential.[11] A similar inference cannot be made for the weight norm of unity. The weight of children in the U.S. could be consistent with good health and optimal physical development while the TSNS sample could have large numbers of undernourished and overnourished (obese) children that collectively do not work against a norm value of unity.

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[9] If N_{ij} is the average height of children in the U.S. of age i and sex j and n_{ij} is the height of a child in our sample of age i and sex j, then the ratio of this child's height to national norms is n_{ij}/N_{ij}. Averaging this ratio across all observations yields the height growth relative to national norms statistics discussed in the text. The national norms were obtained from National Center for Health Statistics (1976).

[10] Physiological potential varies within age and sex classes because genetic endowments (reflected, say, by height of parents) vary.

[11] This would not be the case if the children of the TSNS sample had genetic endowments superior to those of U.S. children in general.

The finding of adequate or better than adequate diets on average among a low income sample of U.S. population is not an isolated one. The pre-supplement protein and calorie intakes for those children 12 to 23 months in the sample drawn to evaluate the Special Supplemental Food Program for Women, Infants and Children (WIC) were 52.9 grams and 1,290 calories respectively, or nearly identical to the figures of TSNS sample (Edozien, 1976). Average 1973 after-tax household income was $3,800 for all households participating in the WIC evaluations (41,330 infants and children were in the sample).

Further information on the nutritional status of poor American children can be obtained by examining the diets of children light for their age and sex in low income households. In our TSNS working sample the calories and protein intakes of children below the 10th percentile in weight for their age and sex were 1,297 and 54.4 grams, or roughly equal to the full working sample mean and indicative of adequate or more than adequate intakes.[12] Unless present and past nutrient intakes are not correlated, these numbers imply that influences other than diet may be responsible for producing the condition usually associated with undernutrition. The consideration of the empirical results in the next section will enable us to come to firmer

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[12]The mean age of these light for age children is 21 months, so the RDAs for this group average slightly more than those presented in the text for children of 18 months.

The fact that these children light for age have nutrient intakes about equal to the average for all children in the sample is not inconsistent with the hypothesis that children's weight is a good proxy for their appetite. These light children may have a demand for nutrients that is less than the heavier children of the full sample but are encouraged by their parents to eat beyond their appetite because of a concern over the children's growth relative to norms.

conclusions about the role of socioeconomic variables in the choice of diet by parents for their children and about the subsequent effect of nutrient intakes on children's growth.

IV. Empirical Results

A. Reduced Forms

The reduced form relationships derived from equations (6)-(8) relate children's growth and protein and calorie consumption to genetic and parental traits measured by sex, maternal height, age, and birth weight; and socioeconomic influences measured by household income, family size, mother's education, and the breast feeding dummy variable.[13] The reduced form results are presented in Table 3. We are particularly interested in the children's growth reduced forms because of the information they provide on the significance of the genetic and parental trait variables versus the socioeconomic and behavorial indicators in the determination of children's growth. The results show that the latter set of variables are of limited significance in explaining children's growth. The family income and mother's education coefficients generally have low t-values and the addition of these variables and family size to children's growth regressions that already include the genetic and parental trait variables only slightly reduces the unexplained variance in the dependent variables.[14]

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[13] Results for the race, food stamp and urban dummy variables are not presented. These variables were statistically insignificant in the structural equations.

[14] Adjusted R^2's increased by about .02 when the socioeconomic variables were added to either height, weight, or head size regressions that already

(continued on next page)

TABLE 3

Reduced Form Estimates for Height, Weight, Head Circumference, Protein, and Calories

Dependent Variables	Independent Variables									
	Age	Age Sq.	Sex	Mother's Height	Family Income	Mother's Education	Family Size	Breast Fed	Birth Weight	$\bar{R}^2$
Height	1.6 (21.7)	-.017 (-8.2)	1.9 (6.8)	.13 (5.0)	.0007 (1.3)	.003 (.05)	-.07 (-.8)	.3 (.8)	.05 (6.3)	.882
Weight	.46 (15.2)	-.006 (-7.9)	.67 (4.5)	.002 (2.1)	.00003 (1.2)	.02 (.7)	-.04 (-1.3)	-.10 (-.6)	.02 (7.1)	.728
Head circum-ference	6.8 (26.1)	-.12 (-14.3)	11.5 (8.2)	.02 (2.2)	.0003 (1.6)	.57 (2.2)	.54 (1.5)	3.06 (1.8)	.12 (3.9)	.792
Protein	3.43 (6.6)	-.07 (-5.0)	.43 (.2)	.16 (.8)	$.6 \times 10^{-5}$ (.1)	-.05 (-.1)	-1.69 (-2.7)	-4.6 (-1.5)	.01 (.2)	.151
Calories	76.6 (6.9)	-1.36 (-4.5)	8.34 (.2)	4.47 (1.0)	-.002 (-.2)	-3.0 (-.3)	-31.9 (-2.4)	-73.3 (-1.2)	-.91 (-.7)	.210

t statistics in parentheses

N = 463

These results imply, given our conceptual framework, that variation in diet (or health)[15] of young children is not strongly associated with variation in their growth and/or that variation in the socioeconomic variables is not strongly associated with the choice of diet for young children (or with investment in their health). Some evidence on the latter question--the effect of family income and mother's education on the choice of diet for young children--is contained within the protein and calorie reduced forms. These equations indicate that mother's education and family income may be insignificant determinants of children's intakes of these nutrients. We expand on these issues in the discussion of the structural equations that follows.

B. Structural Equations

B.1 Protein and Calorie Intakes

The second stage estimates of the protein and calorie equations are presented in Table 4a. The results are similar for both nutrients. Simply stated, they indicate that children in these low income families get the

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14 (concluded)

contained age, the square of age, the sex dummy, and mother's height. It should also be pointed out that the limited significance of the socioeconomic variables does not appear to be due to colinearity with the genetic and parental trait variables. The t-values of the socioeconomic variables do not increase markedly even when the genetic and parental trait variables are excluded from the children's growth equations.

[15] Although the health variables have been excluded from the model under discussion, these reduced forms are identical to the children's growth reduced forms of the model that included health measures and health equations. Thus, some statements concerning health effects in the present context are not out of order.

TABLE 4a

Structural Equation Estimates for Protein and Calories, Two-Stage Least Squares

Dependent Variables	$\hat{\text{Weight}}$	Family Income	Mother's Education	Family Size
	Independent Variables			
Calories	112.3 (10.1)	-.008 (-.8)	-4.11 (-.4)	-30.1 (-2.3)
Protein	4.05 (7.5)	-.002 (-.4)	-.14 (-.3)	-1.67 (-2.7)

^ indicates predicted value.

t statistics in parentheses.

N = 463.

amount of calories and protein that they "ask for." The child's demand for nutrients (represented by weight of the child) is a very important determinant of intakes.[16] Both family income and mother's education are insignificant determinants of nutrient intakes. These results and the summary statistics showing that the children in our sample have normal rates of growth and development and on average have diets adequate in quantity (calories) and quality (proteins) imply that low income households in the United States have sufficient income and education to provide satisfactory levels of proteins and calories for their children.[17]

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[16]By not controlling for age in the nutrient intake equations, we are implicitly assuming that the demand for nutrients does not differ between infants of the same weight, but of different age. To allow for age effects, age and the square of age were entered into the nutrient intake equations. These variables were significant but reduced the t-value of predicted weight to below one in both the protein and calorie equations. Because the age variables were important instruments in generating the predicted values for weight, the age and predicted weight variables are highly correlated and the second stage estimates are difficult to interpret. One reason why there may not be independent age effects is that growth rates for children less than 36 months vary inversely with age while energy expenditure may vary with age. Thus, these age effects could be offsetting. In any case, it is not particularly important for our purposes whether the weight coefficient reported in the text is capturing age effects. The results we wish to emphasize are those for the socioeconomic variables, which are not sensitive to the specification of the age variables in the nutrient intake equations.

[17]Further support for this view is provided by results obtained for the food stamp variable. The food stamp dummy entered into the nutrient intake equation showed no significant effect of food stamps on protein or calorie intakes. This may indicate that the increase in real income resulting from food stamps is devoted to consumption of other goods rather than food; at the least it implies that food stamps do not affect the protein and calorie consumption of young children in eligible families.

The interpretation of the significant family size variable is complex. The results are not consistent with the notion that, family income constant, family size is negatively related to nutrient intakes of children due to a per capita income effect. This is because with family size constant, increases in family income do not lead to increases in nutrient intakes. The negative coefficient on family size could indicate that parents with larger numbers of children are inefficient in the provision of nutrients to their children, as they appear also to be in the provision of contraception for themselves. In elasticity terms, these family size effects are very small for both nutrients.[18]

B.2 Children's Growth

The second stage estimates of the children's growth equations are presented in Table 4b. The protein variable has been excluded from the weight equation because it was statistically insignificant if calories were also included as an explanatory variable. Calories, however, approached statistical significance in these equations even when protein also appeared. The number of calories then seems to better explain weight growth than the protein content of the diet. These results do not indicate that protein is an unimportant determinant of children's weight. Protein and calories are highly colinear (r = .88) so a good portion of the protein influence is captured by the calorie variable. An argument with a similar framework explains why protein appears in the height and head growth equations while calories does not.

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[18] The elasticities in each case are about -.05.

TABLE 4b

Structural Equation Estimates for Height, Weight, and Head Circumference, Two-Stage Least Squares

Dependent Variables	Independent Variables							
	$\hat{\text{Calories}}$	$\hat{\text{Protein}}$	Age	Age Squared	Sex Dummy	Mother's Height	Birth Weight	Breast Fed
Weight	.002 (1.2)		.36 (4.5)	-.004 (-2.8)	.65 (4.3)	.02 (1.9)	.03 (6.5)	
Height		.013 (.8)	1.54 (10.3)	-.02 (-4.9)	1.92 (5.6)	.14 (5.2)	.05 (6.6)	
Head circumference		-.19 (-.9)	7.4 (9.6)	-.13 (-7.8)	11.4 (7.5)	.35 (2.9)	.13 (3.5)	2.6 (1.4)

^ indicates predicted value.

t statistics in parentheses.

N = 463.

The most striking difference between the results for height and head growth as compared to weight growth is the sensitivity of these variables to nutrient intakes. The elasticity of weight with respect to calories is .26 while the elasticities of height and head circumference with respect to protein are .02.[19] It appears then that, in contrast to weight, the height and head growth of children, given birth weight, proceed on a course determined largely by age and the genetic influence of mother's height. There is little the household decision makers can do to alter these paths if protein intakes are restrained to that range characterizing the TSNS sample. The weight gain of children, while also influenced by birth weight, age, and mother's height, is much more subject to intervention by homemakers via the choice of diet than height and head growth.

Breast feeding, holding protein intake constant, does have a positive but small impact on head size. This is consistent with the hypothesis of Jelliffe (1976), who argues that breast feeding may be preferable to bottle feeding because the high lactose and fatty acid content of human as opposed to cow's milk "seem biochemically designed to facilitate the main characteristic of the new born which is the rapid growth in size and complexity of the brain."[20] The breast feeding dummy was insignificant in the height and weight equations.

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[19] Elasticities computed at the means given nutrient intake point estimates. It should be pointed out that the calorie coefficient approaches statistical significance while the protein coefficients do not.

[20] Jelliffe (1976), p. 1229.

C. Birth Weight

Although household income and mother's education may not be significant determinants of the nutrient intakes of young children in the household, this does not rule out a role for these variables in children's growth. We have already argued that these variables may be important indicators of investment in children's health, although we were unable to establish the extent of the health-growth relationship in our empirical analysis. Birth weight, which we have shown to be an important predictor of children's growth,[21] is another intervening variable through which socioeconomic effects on children's growth may be transmitted. Below we present ordinary least squares estimates of birth weight as a function of socioeconomic, genetic and parental trait variables, and birth order.

$$\begin{aligned}
\text{Birth weight} = 37.6 &+ \underset{(18.8)}{.28}\ \text{mother's weight} \\
&+ \underset{(5.7)}{.04}\ \text{mother's height} + \underset{(2.9)}{3.09}\ \text{sex dummy} \\
&\quad \underset{(-12.0)}{-7.4}\ \text{race dummy} + \underset{(6.4)}{.93}\ \text{birth order} \\
&+ \underset{(.4)}{.0002}\ \text{family income} - \underset{(-.2)}{.14}\ \text{mother's education} \\
&\quad \bar{R}^2 = .10
\end{aligned}$$

t statistic in parentheses

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[21] Birth weight is also an important health predictor. Low birth weight is a major factor in infant mortality and low birth weight children are more likely to have health, behavior, and learning problems by school age (Fuchs, 1974, p. 34).

Household income and mother's education are statistically insignificant. Mother's height and weight are both highly significant, with mother's height having the dominant elasticity (.55 vs. .16). Black children, other things equal, have birth weights about 7 percent lower than whites. Our results, then, continue to indicate that household income and mother's education do not play an important role in determining the growth pattern of children in the U.S.

IV. Implications

We began this paper by arguing that parent's utility is a positive function of children's growth and that parents forego other pleasures to augment the growth of their children. The empirical results have indicated that low income families in the United States chose diets for their children that maximize their growth potential, at least as far as height and head size are concerned. The low elasticities of these growth variables with respect to protein and a level of protein consumption substantially in excess of recommended dietary allowances together imply that these low income parents have pushed the growth of their children through choice of diet nearly as much as possible. We have also found mother's education and family income to be insignificant determinants of nutrient intakes. Thus, the picture that has emerged is that the education and income levels in low income households are generally sufficient for the provision of adequate diets for children in the household. Family incomes in these households could well be insufficient for the purchase of what Mr. Lowe and others consider to be the "essentials of life." If that is the case, other essentials are sacrificed for the growth and well being of the children.

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