

**Children's Pay Envelopes and the Family Purse:
The Impact of Children's Income on Household Expenditures**

Carolyn M. Moehling
Department of Economics
Rutgers University

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Abstract

In the United States a century ago, children's labor earnings were considered the property of their parents. Working children turned over most of the contents their pay envelopes to their parents. Accordingly, surveys of household budgets conducted during the period, as well as most subsequent analyses of these surveys by historians, treat children's income as simply part of family income. But did a dollar of income from children have the same impact on household expenditures as did a dollar of income from the father? Using data from the Bureau of Labor Statistics Cost of Living Survey 1917-1919, this paper shows that earnings from children altered intrahousehold resource allocations. Holding total expenditures per capita constant, increases in the share of household income brought in by children ages 12 to 16 decreased expenditures on the father's clothing and the clothing of younger children in the household but increased expenditures on food.

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On August 31, 1917, Judge James E. Boyd of the U.S. Federal Court's Western District of North Carolina declared the first federal child labor law, the Keating-Owen Act, to be unconstitutional and ordered a permanent injunction on its enforcement. Although he offered no written explanation of his ruling at the time, he later argued that the measure violated the due process clause of the Fifth Amendment because it deprived a father of the *right* to his children's earnings until they reached the age of 21 (Trattner 1970, 135).¹ Judge Boyd was not espousing an outlandish or fringe view. Most working children during this period turned over all of the contents of their pay envelopes directly to their parents. Children's earnings were viewed as the property of their parents.

Studies of the family economy during this period therefore tend to treat children's earnings as simply one component -- and an important one at that -- of family income. Contemporary observers, and later, historians, argued that only by sending children into the labor market could families stay out of poverty and debt. But did income from children have the same effect on household expenditure patterns as did income from other sources? The implicit assumption made in most studies of household expenditures is that a dollar from children earnings had the same effect on the family budget as an additional dollar from the father's earnings; all that mattered was that the family purse was now larger. But was this the case?

In the past few decades, economists have increasingly questioned whether family members pool income. A number of studies have shown that the *sources* of household income influence how households allocate their resources (Thomas 1990; Browning et al. 1994; Hoddinott and Haddad 1995; Udry 1996; Duflo and Udry 2004). Most of these studies interpret these findings as evidence of collective decision-making in the household. Households are viewed as made up of individuals with potentially conflicting objectives. The outcomes of household decisions, therefore, reflect the relative power of different members of the household. Most of these studies have focused on the interactions between husbands and wives, but recent research has extended these models to include children as

¹ The Supreme Court later ruled that the Keating-Owen Act was unconstitutional on the grounds

potential decision-makers. Moehling (2005) has argued that working may have given children greater influence in household decisions, particularly consumption decisions.

But one need not assume a collective model of the household to argue that children's income may have had a different impact on household spending patterns than income from other sources. Working children may need to consume more food or more expensive clothing. Such costs of working would mean that the additional income generated by sending children to work would have a different effect on household expenditure patterns than an equivalent amount of income coming from an increase in the fathers' wage. But there is another possibility consistent with the unitary model of the household: parents may have seen children's earnings, particularly the earnings of young children, as having only certain legitimate uses. Such a notion is consistent with Basu and Van's (1998) "luxury axiom" of child labor: if parents only sent children into the labor market as a response to economic hardship, children's earnings may have been reserved for paying off debts or buying necessities.

This paper examines how children's income affected household expenditure patterns using the Bureau of Labor Statistics' Cost of Living Survey of 1917-1919. The Cost of Living survey collected detailed earnings and expenditure information, including data on the clothing expenditures for each member of a household. Therefore, these data allow us to test whether income from children affected at least one component of the private consumption of different members of the household. The focus of the analysis is on the earnings of younger children, ages 12 to 16. These children had limited opportunities to leave the household and hence, one might expect, limited bargaining power in household decision-making.

Children's Pay Envelopes and the Family Purse

In a budget survey conducted by the U.S. Commissioner of Labor in 1889-90, almost 30 percent of families had working children (Haines 1979). Almost 30 years later in 1917-1919, the Commissioner's

that it was an unwarranted exercise of commerce power, and in effect, an invasion of states' rights.

successor, the Department of Labor, found that 19 percent of white families and 26 percent of black families living in industrial cities had working children (U.S. Bureau of Labor Statistics 1919).² The income generated by these children accounted for a substantial share of household resources. In the 1917-1919 survey, among families with working children, children's earnings accounted for on average 23 percent of total income. Social workers and social scientists at the time argued that without children's earnings, many families would find themselves in debt or poverty.

Many of these working children were sons and daughters in their late teens and early twenties. But a substantial fraction were younger children. Although their contributions to the family purse were small relative to those of older children, these contributions were still seen as vital to the welfare of the family. Homer Folks, Vice-Chairman of the National Child Labor Committee (NCLC) of New York, argued in 1907 that the last line of resistance to child labor laws was the "economic need" argument (Folks 1907). Folks and the NCLC assembled data and wrote papers arguing that few households sent their children to the market due to economic need. But their campaign did not succeed, at least not nationally. The court cases brought forth to challenge the federal child labor laws in the late-1910s once again asserted the importance of children's earnings to the family economy.

Child workers, too, explained their participation in the labor market in terms of the needs of their families. Marie Proulx, who began working at the Amoskeag Mill as a teenager, explained her situation as follows:

My father was never able to support a family of eight children on \$1.10 per day.... So I had to go work somewhere, and all there was were the mills, there was only Amoskeag. We had to help our father; I was the oldest one (Hareven 1982, 190).

Similar sentiments were expressed by a man who grew up in the Polish community in Pittsburgh in the early 1900s:

We looked forward to the time when we got to the legal age. When we got to that point we quit school and got a job because we knew the

²In these surveys, the term "children" refers to the offspring of the head of the household rather than to individuals in a certain age category.

parents needed the money....That's just the way we were raised (Bodnar, Simon and Weber 1982, 93-4).

In a 1903 survey conducted by the New Jersey Bureau of Statistics of Labor and Industries, over half of the surveyed workers ages 12 to 16 stated that their earnings were "necessary for their own support."³

Consistent with this, working children turned over almost all of their earnings directly to their parents. Hareven (1982) argues that among workers at the Amoskeag Mill in Manchester, New Hampshire this custom was an "unwritten law." In the New Jersey survey of 1903, 632 out of 714 young workers ages 12 to 16 reported giving *all* of their income to their parents. Most of the rest turned over least half of their pay envelopes to their families.

If ever there were a context in which income-pooling within the family would seem likely to hold, this would seem to be it. But there are reasons to be circumspect of income-pooling even here. First of all, sending children into the market may have resulted in additional expenditures for households if working children had to consume more food or have certain types of clothing. Given the jobs that children had during this period, it is unlikely that the added clothing expenditures were very large, but the extra food requirements could have been substantial. Being an errand boy or working a 10 hour shift in a factory likely meant greater physical activity and hence greater caloric and other nutritional requirements. Such non-separabilities would not necessarily lead to a violation of income-pooling, but it would lead to a violation of one of the most commonly tested predictions of income-pooling: that only the amount, and not the source of income, matters.

More intriguing, though, are the two other theories as to why income from children would have a differential impact on household spending patterns than income from other sources. The first is inspired by contemporary observations of working children and their families in the early twentieth century. The second is inspired by economic models of child labor developed in the past couple of decades and insights from anthropological research.

The same studies that report that working children retained no control over their earnings also argued that entering the labor market altered the interactions of children with their parents. In their 1913 study, Robert A. Woods and Albert J. Kennedy argued that the girl who entered the labor market, "suddenly became powerful where shortly before she was weak" (p. 37). Woods and Kennedy emphasized how working changed girls' attitudes, noting girls' sentiments that they "could do what they please" and that "they shouldn't be restrained" (pp. 36-37, 52). But Woods and Kennedy also claimed that the household changed in relation to the girl. As an example they noted that girls in the labor market were less likely to subject to physical punishment (p. 45).

Louise Montgomery noted similar changes in the interactions between parents and working children in her study of girls in the Chicago stockyards district (1913). 290 out of the 300 girls ages 16 to 24 whom Montgomery interviewed claimed to have "no independent control" over their wages. Yet she goes on to note the conflicts between these girls and their parents as to how much money was allocated for their private expenditures, notably clothes and entertainment.

Girls sometimes complain that they do not have enough "returned" to them in spending money and in "the kind of clothes other girls wear." If the mother is indulgent with her daughter's desire for evening pleasures and some of the novelties and frivolities of fashion, there is little friction; if she fails to recognize these legitimate demands of youth, the distance between mother and daughter is widened (p. 58).

Montgomery later notes that conflicts between working children and their parents also extended to elements of joint consumption. Children, she claims, demanded "a better grade of food, more comfortable furnishings, or an additional room in the flat" and parents had to make concessions to these demands:

If [the mother] wishes to retain her hold on the family purse, she is often forced to make compromises, and the children on their part are often obliged to conform to the stern authority of the parents (p. 60).

³ These data calculated from data made available through the Historical Labor Statistics Project and described in Carter et al., *Codebook*.

This supposed power of working children came from the threat of them not working or reducing their work and hence reducing the income they brought into the household. Montgomery actually observed parents using financial incentives to induce girls to earn more. She found that when doing piecework, some girls refused to go beyond a “comfortable speed limit” and some even “found a pleasurable excitement in discovering just how ‘comfortable’ they could be without losing their position.” In response, mothers would often give “additional incentive to increased speed” by tying spending money and even funds for necessary clothing to the girls’ earnings (p. 29).

These observations of the interactions of working children and their parents fit well into the bargaining or collective models of household decision-making put forward by economists in the last three decades.⁴ While these models are generally motivated by and applied to the interactions of husbands and wives, they are easily extended to include other members of the household, like children, as potential decision-makers.

Moehling (2005) used such collective models of the household to motivate her test of the claims made by Woods and Kennedy, Montgomery, and others about the influence of working children in household decisions in the early twentieth century. Using data from the 1917-1919 BLS Cost of Living Survey, she estimated household-fixed-effects models to see how working affected one element of a child's private consumption: clothing expenditures. She found that expenditures on the clothing of working children were substantially larger than the expenditures on the clothing of their non-working siblings. Moreover, the size of this "bonus" was increasing in a child's earnings. To probe whether this was just a consequence of working children needed more or more expensive clothing, Moehling then restricted the analysis to only children who were working and controlled for the children's occupations. The relationship between earnings and expenditures on clothing remained. Moehling interpreted her findings as being consistent with the qualitative evidence of the time: children's contributions to family income gave them more influence in household consumption decisions.

Moehling's results have met with some skepticism, especially in how they pertain to younger children. Children in their late teens and early twenties could credibly threaten to leave home, but younger children could not. This would seem to undercut any argument about children ages 13 or 14 say, having any power to bargain with their parents as to how the family income should be spent. Moehling, in fact, found that the elasticity of expenditures on clothing with respect to earnings was higher for children aged 18 to 24 than for children 12 to 17 (pp. 435-436). The ability to leave the household did seem to give older children stronger bargaining positions. However, Moehling still found statistically and economically significant effects of earnings on the expenditures on the clothing of younger working children.

But with younger working children, there is an alternative theory as to why children's income would alter household expenditures that would still be consistent with a unitary model of household decision-making. The earnings of children may simply have been viewed by parents as belonging to a separate "account" that could only be used for certain purposes. Economists view income as fungible, but anthropological research reveals that, in many contexts, households link income from particular sources to particular types of expenditures. For instance, in the Côte d'Ivoire, income from yams is traditionally used to purchase household public goods whereas income from cash crops tends to be used to buy private goods, particularly the private goods of the cultivator of those crops. Consistent with this, Duflo and Udry (2004) find that rainfall shocks that increased the output of yams led to increased budget shares of staples, overall food consumption, and education. In contrast, shocks that increased the output of other crops led to greater shares of expenditures on adult private goods.

The idea that earnings from children may be treated as belonging to a separate account is consistent with Basu and Van's (1998) "luxury axiom" in their model of child labor. This axiom states that "a family will send the children to the labor market only if the family's income from non-child-labor sources drops very low" (p. 416). Parents, it is claimed, would prefer not to send young children to work.

⁴See for example, Manser and Brown (1981), McElroy and Horney (1981), Lundberg and Pollak

They do so only in response to hardship. Accordingly, we might expect that children's earnings would only be used for necessities or more child-oriented goods, and not for parents' private consumption goods.

A somewhat similar notion has been developed and tested before in the context of child labor in the U.S. Parsons and Goldin (1989) developed a model of the household in which child labor was a response to capital constraints. In this model, households send children to work only because they face capital constraints and cannot borrow against their children's earnings in adulthood. This has the same spirit of the "luxury" axiom: households would prefer to send children to school or keep them at home, but cannot because of the constraints that they face. The theoretical prediction of Parsons and Goldin's model is that households should not simultaneously accumulate assets *and* have children working in the labor market. Parsons and Goldin contrasted this model to what they called an "altruism/entitlements" model. In this model, parents have no control over their children's income in adulthood. Therefore, parents who place little value on their children's welfare as adults, send children into the market in order to capture their earnings while they are still under parental control. In this model, parents would be expected to accumulate assets when their children were working in the market.

Parsons and Goldin tested these predictions using the 1889-1890 budget survey conducted by the U.S. Commissioner of Labor. They found that, in contrast to the predictions of the capital constraint model, families with working children had positive savings. Moreover, the rate of saving out of children's income was the same as that out of other family income (p. 650). Parsons and Goldin interpreted this as evidence that at least in the American case, sending children into the labor market was due to the selfishness of parents rather than economic hardship or capital constraints.

Parsons and Goldin's empirical test is problematic on a number of levels, however. First, the 1889-1890 survey did not provide information on which children in the household were working. Therefore, Parsons and Goldin could not separate out the income earned by "child labor" and the income earned by older teenagers and young adults still living in the household. The models they used to

(1993) and (1994), Bourguignon et al. (1995), and Browning and Chiappori (1996).

generate their testable predictions are most appropriate for younger children for whom the opportunity cost of working was not attending school. In addition, the measure of savings that Parsons and Goldin used is a residual measure: the difference between total income and total expenditures reported by a household. This variable is a quite noisy measure of savings. Without being too creative, one could construct scenarios where this noise might be related to the importance of income from children. But there is a more fundamental criticism of Parsons and Goldin's test: in an environment where households had to self-insure, one might expect that parents sent children into the labor market expressly to build up a nest egg to help them weather economic hardships in the future. Were parents being selfish or prudent?

Parsons and Goldin's provocative conclusion continues to raise eyebrows and generate counter-attacks. But for the study at hand, what is most significant is that they found that children's income had the same effect on the level of household savings as other income. In other words, their results are consistent with the notion of income-pooling.

The Bureau of Labor Statistics Cost of Living Survey of 1917-1919

The analysis here considers a broader range of expenditure categories than just savings. The goal is not to test a particular model of household decision-making, but rather to see if we can reject models which imply that children's income affected household behavior only through a straightforward income effect. The three theories described in the previous section do not, in fact, generate testable predictions that would allow us to distinguish one from another. Moreover, the three theories need not be mutually exclusive. The objective, therefore, is simply to test whether a dollar earned by children had the same effect on household expenditures as a dollar earned by other sources.

The empirical analysis makes use of data collected by the Bureau of Labor Statistics in 1917-1919 to study the cost of living and construct the original weights of the Consumer Price index.⁵

⁵These data were made available through the Inter-University Consortium for Political and Social Research. Martha Olney and Claudia Goldin also provided me with supplementary data files developed

Accordingly, these data include expenditures for a broad range of goods. But what makes them particularly rich for this study is that they include a measure of private consumption – clothing expenditures – as well as information on the labor supply, wages, and total earnings, for each member of the household. The Department of Labor's predecessor, the Commissioner of Labor, had conducted similar budget surveys in 1889-1890 – the data used by Parsons and Goldin (1989) – and 1901. Unfortunately, all that is available for the 1901 survey are state-level averages; the original family survey data have been lost. Family-level data for the 1889-90 survey survive, but as noted above, these data only report the number of working children and total income from children. We do not know which children were working or how much each working child was contributing to household income. Moreover, the 1889-1890 data only report the total expenditures on all children's clothing, and hence, provide no information on the private consumption of working children versus that of non-working children.⁶

The timing of the 1917-1919 data would seem to be problematic for two reasons. First, the employment of child labor had been on the decline since the late 1800s and, in the first two decades of the 1900s, became increasingly regulated and limited. However, the participation of children in the labor market remained significant. Figure 1 displays the labor market participation rates of children ages 12 to 20 from the Cost of Living Survey and the 1920 Census. To make them more comparable to the Cost of Living Survey data, the Census data pertain to children in urban areas who were still living with their parents. Even by the relatively strong definition of labor force participation available from the census – gainful occupation status – the participation rate of boys was over 10 percent at age 14 and rose to near 30 percent for 15 year-olds. But "gainful occupation" status understates the degree to which children were engaged in market work. In the Cost of Living data, almost 50 percent of boys age 14 and 70 percent of

during their own work with these data. The BLS, ICPSR, Olney and Goldin bear no responsibility for the analyses and interpretations presented here.

⁶The BLS teamed up with a number of other government agencies to conduct a budget survey in the 1930s. The data from this survey also include individual level data on clothing expenditures and labor market outcomes for all members of the household. But these data suffer for having been collected during the Great Depression, a period when all workers, but especially teenage workers, had difficulty finding work.

boys age 15 had some labor earnings. The participation rates of girls were much lower, but still significant especially by age 15. The more dramatic changes in youth school enrollment and labor market participation took place after 1920. In some ways, the 1917-1919 data represent one of the last snapshots of family consumption behavior in the era when children rather than mothers were the most important group of supplementary earners.

The second reason the timing seems problematic is that for much of the survey period, the U.S. was at war. However, very little rationing of domestic consumers took place in the U.S. during the First World War. Some restrictions were placed on consumer purchases, but these did not involve restrictions on the total quantities of goods that a household could purchase (Hardy 1940).⁷ Prices rather than quantity constraints allocated scarce goods across consumers. Another consequence of the war, in fact, makes this period ideal for addressing the question at hand. This was a period of high labor demand and very low unemployment. In this labor market, those who wanted jobs were generally able to find jobs. The higher participation rates of sons ages 18 to 20 in the Cost of Living survey relative their counterparts in the 1920 Census would seem to be evidence of this.

The Cost of Living data were collected through interviews with the households of wage-earners and low- and medium-salaried workers in 99 “industrial centers” in 1918 and 1919. The 99 surveyed cities included cities from all regions of the country and ranged in size from the largest cities of the time, New York City and Chicago, to small one-industry towns like the mining town of Pana, Illinois, which had a population of 6,122 in 1920. Most of the surveyed cities, however, were large cities: 47 had populations of over 100,000 and an additional 31 had populations of over 25,000 in 1920 (U.S. Bureau of the Census 1914).

Interviews were organized by cities and were staggered over a couple of years, however, so that the data cover different annual periods between July 31, 1917 and February 28, 1919. All of the survey

⁷For example, retail buyers were required to purchase wheat substitutes with each purchase of wheat flour for a time in 1918 (Hardy 1940, 152). In the summer and fall of 1918, retailers were

periods, though, overlap for the period from February 28, 1918 to July 31, 1918. Households were interviewed only once and asked for all their earnings and expenditures over the specified year-long period. The data, therefore, suffer from some degree of recall bias. Most interviewed families likely could not provide a complete accounting of all of their expenditures over a one-year period. For small and frequent types of expenditures, like those on food, families were instructed to use expenditures from a typical week and multiply by 52 to approximate annual expenditures. Recall bias would be expected to be relatively small, though, for components of expenditures that were "lumpy" like clothing expenditures. Such expenditures took place fairly infrequently and were large relative to expenditures on other types of goods.

Surveyed households were not randomly selected from the interview cities. To be included in the survey, households had to contain an intact married couple and at least one child. Other selection criteria served to exclude the upper and lower tails of the income distribution. The survey specifically excluded "slum or charity families" and non-English speaking families who had resided fewer than five years in the U.S., and required that at least 75 percent or more of a household's total income come from family labor earnings (U.S. Bureau of Labor Statistics 1924, 2). Particularly important for this study, the survey required that all family members contribute all their earnings to "the family fund." Households in which children had boarding arrangements with their parents were excluded (U.S. Bureau of Labor Statistics 1919, 30). However, as discussed above, the vast majority of sons and daughters living at home contributed all their earnings to their parents. The survey also required that households reside in the same locality for the entire year covered in the survey and be able to provide all items of expenditure and income of household members other than those living as lodgers (U.S. Bureau of Labor Statistics 1924, 2).

Over 12,000 households participated in the survey. The analysis here, however, focuses only on those households in which the oldest child present was between the ages of 12 and 16. The objective is to

forbidden to sell consumers in excess of three, and later two, pounds of sugar per month. However,

see how income from what would be termed "child labor" impacted household decision-making.

Therefore, we want to restrict the sample to those households who had children old enough to work in the market but not old enough to leave home. Households with older children were excluded to try to isolate the impact of younger children's earnings on household consumption decisions. Older children were potential decision-makers in households. How a 14 year-old's earnings would affect intrahousehold resource allocations would likely have depended on whether there were older siblings in the household. Due to the use of city-level census data in the estimated models, the sample had to be further limited to households living in cities with populations greater than 10,000. This excludes, however, a relatively small number of households since most of the survey cities were large. Finally, while the survey did collect data on several hundred black families, the analysis here only uses the data for white families. The labor force participation rates of black children and their mothers, and hence the contributions to family income of those groups, were very different than those of whites. Black children also had much more limited educational opportunities. The different constraints and opportunities facing black families may have led to different interactions between black children's income and the expenditure patterns of their households. Unfortunately, the sample of black households with children ages 12 to 16 is too small to allow for an examination of this hypothesis.

The final sample contains 2,280 families. Of these families, 732 had working children ages 12 to 16.⁸

The Share of Income from Children Ages 12 to 16 and Household Expenditure Patterns

The earnings of working children increased family income, so the effects of working children on expenditure patterns included income effects as well as any distributional effects. The objective here is to

consumers were not prohibited from buying sugar from more than one retailer (p. 158).

⁸The selection criteria of the Cost of Living survey skewed the overall sample of 12,000 households toward younger families, so only about a third of the surveyed households contained sons and daughters age 12 or older. In comparison, in the Integrated Public Use Sample (IPUMS) data for the 1910

isolate the distributional effects. The question is: how did the expenditure patterns differ between two households with the same total household income but with different shares of income from children? This question is answered by estimating a system of Engel curves for the components of households expenditures which include as an additional explanatory variable, the share of family income derived from children's earnings. Engel curves map out the relationships between income and the consumption of different goods. By including the children's share of income as an additional variable, we can determine how the consumption of goods varied as the sources of family income varied, holding total family income constant.

The estimated equations are an adaptation of the Working-Leser Engel curve which allows for the effects of household demographic variables:

$$(1) \quad w_{ij} = p_{ij}q_{ij} / x_i = \alpha_j + \beta_j \ln(x_i/n_i) + \gamma_j [\ln(x_i/n_i)]^2 + \delta_j \ln(n_i) + \sum_{k=1}^{K-1} \phi_{jk} (n_{ik} / n_i) + \theta_j s_i + y_i' \pi_j + u_{ij}$$

where w_{ij} represents the share of total expenditures spent by household i on good j , p_{ij} represents the price per unit of good j , q_{ij} represents the quantity of good j purchased by the household, x_i represents total expenditures, n_i represents household size, n_{ik} represents the number of household members in demographic group k , s_i represents the share of income from children, y_i represents a vector of control variables, and u_{ij} represents the error term. The way in which demographic variables have been incorporated into (1) allows for both the number of household members (n_i) and the age and sex composition of those members (n_{ik}/n_i) to affect expenditure patterns. This specification permits the effects of the addition of a member of any demographic category k to vary with household size.

The parameter, θ_j , is intended to capture the distributional effect of children's earnings. But if (1) is estimated using Ordinary Least Squares (OLS), this term will not necessarily capture the effect of interest. The share of income from children is clearly an endogenous variable. The presence of working children in a household was likely correlated with other household characteristics that also affected

census, approximately one-half of urban families containing an intact married couple and at least one

consumption patterns. Such correlations fit into both the unitary and collective household models. In both frameworks, the decision to send children into the labor market depends on the difference in the utility level when children were working and the utility level when children were in school or in the home. Observable household characteristics such as size will affect this decision as well as influencing household expenditure choices. More problematic, unobservable characteristics will also produce such correlations. Families with greater preferences for adult goods relative to human capital investment in children or children's leisure would have been more likely to have children working as well as to have greater expenditures on adult goods. Moreover, the collective models suggest an additional explanation of a correlation between the presence of working children and spending patterns: if working gave children more influence in household consumption decisions, then the children with the greatest incentives to work would be children whose preferences were the most in conflict with the preferences of their parents.

To deal with this potential endogeneity problem, the models are estimated both by OLS and by an instrumental variables approach. The IV approach requires identifying variables that affected the share of income from children but not household expenditure patterns, after controlling for children's income share. Three variables are used here. The first is a measure of the labor market opportunities of children given the industrial structure of the local labor market as measured by the occupation reports in the 1920 Census. This "city industry mix" variable is the predicted employment share of children in a city given the distribution of employment across industries in the city and the employment shares of children by industry nationally. It is similar in spirit to the "industrial mix" measure used by Bowen and Finegan (1969) in their classic study of labor force participation.⁹ The second instrument is the percentage female among a household's children ages 12 to 16. Given the more limited labor market opportunities of girls

child contained a son or daughter age 12 or older.

⁹The city industrial mix variables were calculated as follows. First, the share of children's employment in the national employment of each industry was calculated using the 1920 census data. Then, the children's share of national employment in each industry was multiplied by the number of workers in that industry in a city. These products were then summed. The sum represents the number of children who would have been employed in a city if children's share of employment in the city's

and their lower wages, the greater the share of girls in this group would be expected to be negatively correlated with children's income share. One might expect the gender composition of 12 to 16 year olds to also affect consumption patterns. But these effects should be captured in the Engel curve specifications by the shares of boys age 12 to 16 and girls ages 12 to 16 in household membership as whole (the (n_{ik}/n_i) terms). The maintained assumption is that after controlling separately for the proportions of boys and girls in the household, the ratio of these proportions should only affect consumptions patterns through their effect on children's share of household income. The final instrument is just the interaction of the city industrial mix and the percentage female in the 12 to 16 year old age group.¹⁰

Table 1 presents the descriptive statistics for the variables used in the analysis. Total expenditures on non-durables are divided into eleven categories: father's clothing, mother's clothing, clothing of children ages 12-16, clothing of children ages 0-11, food, meals eaten outside the home, alcohol and tobacco (adult goods), entertainment, school and books, fuel, and other expenditures.¹¹ The control variables consist of indicators of father's occupational class, mother's age, residence in the South, and interview date. Father's occupation is included to allow for any class differences in spending patterns as well as occupation-driven consumption requirements. For instance, men with professional occupations likely had to have very different wardrobes than men in unskilled occupations. Likewise, men in unskilled occupations which required more physical activity, may have had greater caloric needs. Mother's age is intended to capture the age and life-cycle stage of the household. The interview date is

industries were the same as children's share of employment in those industries nationally. This number was then divided by the total number of employed persons in the city to get the industry mix measure.

¹⁰Earlier versions of this paper presented estimates of a switching regression model in which the first stage was a tobit model to account for the censoring at zero. This model took into account some key features of the problem at hand which the IV model presented here do not: the censoring of children's income at zero and the explicit estimation of the selection of households who had working children. The price, though, was a number of strong parametric assumptions.

¹¹Entertainment expenditures include expenditures on movie tickets, plays, concerts, lectures, dances, pool, excursions, vacations, and miscellaneous entertainment expenses. Expenditures on school and books include tuition, school books and supplies, expenses of children living away from home (presumably at school), books, newspapers, and magazines.

included to account for any systematic seasonal or other effects arising from the date the household was interviewed.

The data in Table 1 reveal that households with working children spent smaller shares of their budgets on parents' clothing and larger shares on children's clothing than households without working children. But households with working children were also larger and had lower expenditures per capita. They also were less likely to have a father in a professional occupation. Among households with working children, the mean share of income from children was 12 percent. Even in these households, therefore, father's earnings accounted for the vast majority of household income.

Results

Table 2 presents the results of the first stage model for the share of income from children. Children's income share was strongly related to a household's demographics. Not surprisingly, it was increasing in household size and in the proportions of household members who were between ages 12 and 16. It was also increasing in the proportions of younger children in the household. Most important for the analysis here, children's share of income was correlated with the industrial structure of the city as captured by the industrial mix variable. The estimated effects of the other two instruments are not statistically different from zero. However, the F-test statistic for the joint significance of the instruments including the interaction terms is 6.62 (p-value = 0.005) and the partial R-squared is 0.011. This indicates that the instruments do have some power in explaining the variation across households in the share of income from children.

Table 3 presents the coefficients on children's share of income from the both the OLS and IV estimation of equation (1). The reported standard errors have been corrected for potential clustering by city due to the use of city-level instruments. The OLS results suggest shifts in the composition of consumption consistent with collective models of the household. As income from children increased, expenditures on parents' clothing fell and expenditures on the clothing of children ages 12 to 16

increased. The only result that does not fit this pattern is that expenditures on alcohol and tobacco were increasing in children's income share. But as discussed above, the OLS results likely suffer from endogeneity bias. Part of the correlation between children's income and expenditure patterns may be due to other household characteristics like preferences for adult welfare over children's welfare that affect both children's labor force participation and consumption decisions.

The OLS and IV estimates differ in a number of notable ways. Interestingly, though, Hausman tests based on these estimates fail to reject the hypothesis that children's income is exogenous. The standard errors in the IV models are relatively large and in many cases confidence intervals around the point estimates include the OLS coefficients. Since the models are over-identified in that there are more instruments than endogenous variables, we can conduct tests of the overidentifying restrictions. Only in the case of meals eaten outside the home were these restrictions rejected. This rejection is likely due to a correlation between the prevalence of eating establishments and the employment opportunities of children that is captured in the city industrial mix variable.¹²

Like the OLS estimates, the IV estimates also reveal a shift away from the private consumption of other household members as children's income increased. Expenditures on both father's clothing and clothing for younger children in the household decreased as children's share of income increased. The coefficient on children's income share in the IV specification for father's clothing is substantially larger, in absolute terms, than that from the OLS specification. This is consistent with the notion of endogeneity bias. If households that sent children into the labor market had higher preferences for adult goods than those that did not, the OLS coefficients on children's income share would be biased toward zero. Also consistent with this is the fact that in the IV estimates, children's income no longer has a positive effect on expenditures on alcohol and tobacco which are traditionally viewed as adult goods.

¹² A number of alternative instruments were tried: children's share in manufacturing employment in a city in 1914, the percentages immigrant or black in a city (substitutes for child labor), measures of child labor laws, school quality data, etc. In general, these alternative instruments failed the overidentification test for more categories of household expenditures and often had less explanatory power in the first stage equation.

But the IV estimates also indicate that expenditures on the clothing of 12 to 16 year olds were decreasing as children's income share increased. The standard errors on this effect are quite large, but the point estimate suggests a sizable decrease in the budget share as children's income increased. It is important to keep in mind that not all of the children in the 12 to 16 year old category were working. The large negative effect could be an indication that those children who did not work simply received much less in terms of their private consumption as their siblings entered the labor market.

What really stands out, though, in Table 3 is the large positive impact of children's income share on expenditures on food eaten at home. A one percentage point increase in children's income share led to almost a one percentage point increase in the share of food expenditures in the family budget. This implies that a large fraction of children's income went to buying more food.

To illustrate these results more sharply, Table 4 presents the predicted shares and expenditures on the twelve expenditure components for three hypothetical households. All three hypothetical households are defined as having the mean of the control variables for the full sample. The three households differ in their total expenditures on nondurables and the share of income from children. Household #1 has \$1,216 in total expenditures (the sample mean) and zero income from children. Household #2 also has \$1,216 in total expenditures but children's income accounts for 12 percent of its total income. Household #3 has \$1,362 ($1,216 \times 1.12$) in total expenditures and children's share of income is 12 percent.

The comparison of households #1 and #2 addresses the question which motivated this section: how did the expenditure patterns differ between two households with the same total household income but with different shares of income from children? The bottom-line is straightforward to predict given the coefficient estimates in Table 3, but the data in Table 4 illustrate the magnitudes of these effects. As children's share of income increased from zero to 12 percent, expenditures on father's clothing fell by \$23.53 or 32 percent, and expenditures on food increased by \$141.61 or 27 percent.

The comparison between households #1 and #3 address a different question: how did the expenditure patterns differ between two families with the same *level of income from the parents* but

different shares of income from children? In the comparison of households #1 and #2, by holding total expenditures constant while increasing the share of income from children, parents' income is forced to decrease. In comparing households #1 and #3, the share of income from children increases from 0 to 12 percent without changing parents' income. The experiment inherent in this comparison is: how would the \$146 of additional income generated by working children be allocated? The interesting part of the answer is that none of it would be spent on the clothing of the father. The positive income effect was completely counter-balanced by the negative effect of the increase share in income from children. The results imply that all of the additional income would be spent on food. In fact, the point estimates indicate that additional funds would be shifted out of private good expenditures to purchase more on food. The standard errors on the predicted budget shares are relatively large, however. A 95 percent confidence interval around the budget share on food implies a possible range of food expenditures of \$650 to \$791. Nonetheless, even with the imprecision of the estimates, it is clear that additional income from children was spent on household public goods and not private goods.

The sizable impact of children's income on food expenditures deserves further investigation. Was this due to the greater caloric requirements of working children? Or were households purchasing a better grade of food or a more varied and nutritional diet? To probe this further, food expenditures were broken down into six categories: "starchy" (cereals, bakery goods, potatoes, leavening agents), "meaty" (meat and eggs), "fatty" (oils, lard, butter, oleo), "milky" (dairy except butter), "sugary" (sugar and sweets), and "flavorous" (fruit, vegetables, beverages, and miscellaneous). Table 5 presents the coefficients on children's income share from the estimated Engel curves for these six components of food expenditures.

Greater income shares of children did not lead to greater expenditures on starches, which are the cheapest form of calories. Rather, children's income led to greater expenditure shares of meat and dairy products. As the share of income from children increased, households purchased diets that were richer in protein, a nutrient essential for children's mental and physical growth and development.

Discussion and Conclusion

Just as previous research has shown for a variety of settings that the distribution of income across husbands and wives affects intrahousehold resource allocations, this paper has shown that the distribution of income across parents and their children affected intrahousehold resource allocations in the U.S. a century ago. Unlike other papers in this literature, however, this paper is not taking a strong stand that the rejection of income-pooling means the rejection of the unitary model of the household. As developed above, an impact of children's income share on the composition of household expenditures can also be generated in the context of a unitary model of the household.

The basic finding is that as the share of income from children increased, the composition of consumption shifted from private consumption goods to public consumption goods, specifically food expenditures. This pattern could be explained by any of the three theories of children's income and intrahousehold allocations outlined above. The fact that expenditures on the clothing of children ages 12 to 16 declined as the share of income from children increased would seem to cast doubts on the collective model of household-decision making. But this category includes the clothing of both working and non-working children. What seems more significant is the decline in the expenditure share of father's clothing as children's income increases. Children's income was not used for the private consumption goods of the father.

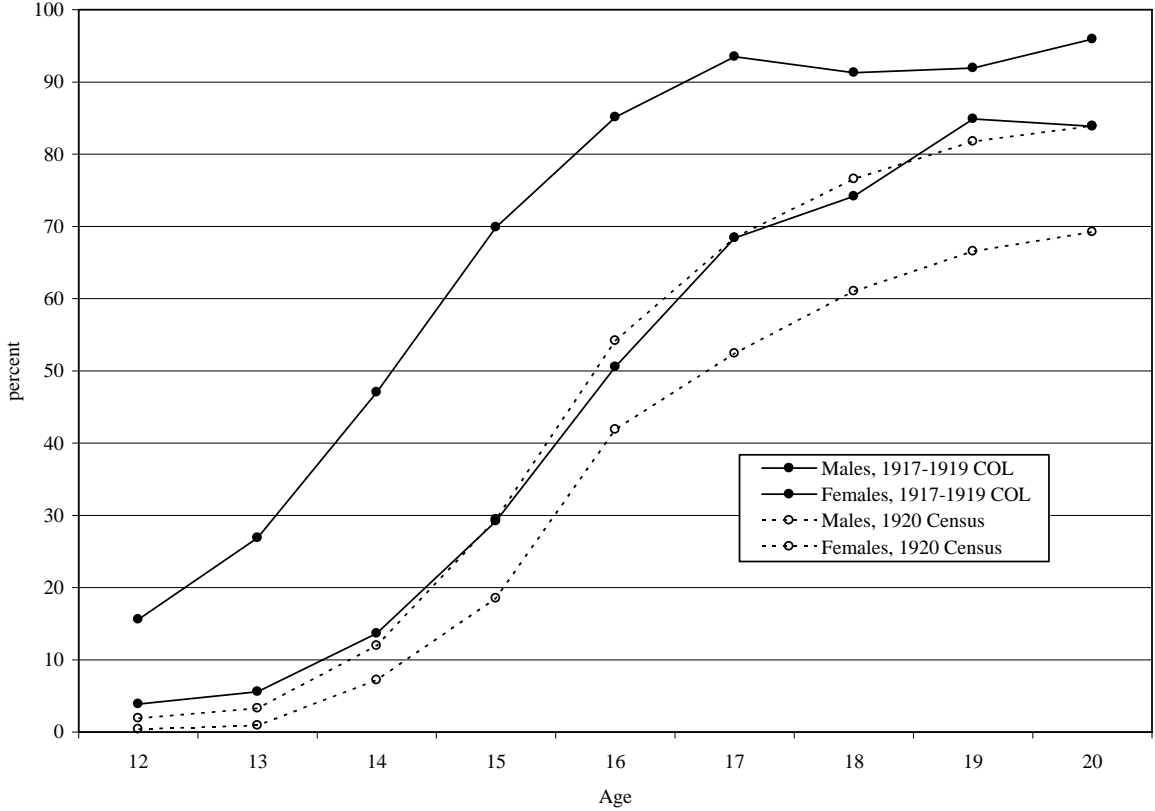
The significance of these findings is that they imply that the welfare of members of a household depended not just on the total income of the household, but also the sources of that income. Two households with the same income but different shares of income from children would have had different distributions of resources across their members. When we study the welfare effects of child labor, we consider primarily the impact on the children at work. How child labor affects other members of the household is usually only discussed in terms of the income effects of child labor. The results here suggest that there were also distributional effects of income from children that affected all members of the household.

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**Figure 1.--Labor Market Participation Rates of Children, Ages 12-20,
1917-1919 Cost of Living Survey and 1920 Census**



Note: Census figures pertain to males and females in urban areas still living with their parents. Labor force participation in the Cost of Living Survey data is defined as having positive labor earnings; for the Census data, participation is defined as having a reported gainful occupation.

Table 1.--Descriptive Statistics for Sample of Households with Oldest Child Age 12 to 16

	All households		No working children		Working children	
	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.
Expenditure shares:						
Father's clothing	0.052	0.025	0.055	0.025	0.046	0.022
Mother's clothing	0.044	0.027	0.047	0.029	0.039	0.022
Clothing for children, ages 12-16	0.062	0.032	0.054	0.027	0.077	0.036
Clothing for children, ages < 12	0.041	0.031	0.041	0.032	0.042	0.030
Food at home	0.479	0.085	0.477	0.085	0.484	0.085
Meals eaten outside the home	0.012	0.025	0.011	0.024	0.013	0.028
Alcohol and tobacco	0.018	0.021	0.018	0.020	0.019	0.025
Entertainment	0.015	0.019	0.015	0.020	0.014	0.017
Books and schooling	0.018	0.016	0.018	0.017	0.016	0.015
Fuel	0.064	0.023	0.066	0.024	0.062	0.021
Other expenditures	0.195	0.078	0.198	0.079	0.188	0.075
Share of income from children	0.037	0.081	0.000	0.000	0.115	0.106
Total nondurable expenditures	1216	298	1185	292	1282	300
Household size	5.328	1.675	5.095	1.579	5.821	1.764
Proportion of household members:						
Male, ages 0-5	0.051	0.089	0.048	0.090	0.056	0.086
Female, ages 0-5	0.052	0.090	0.051	0.092	0.054	0.087
Male, ages 6-11	0.100	0.120	0.098	0.123	0.106	0.114
Female, ages 6-11	0.092	0.113	0.092	0.115	0.092	0.111
Male, ages 12-16	0.133	0.131	0.106	0.126	0.189	0.124
Female, ages 12-16	0.137	0.132	0.150	0.133	0.110	0.127
Male, ages 17 or older	0.214	0.072	0.223	0.072	0.194	0.068
Father's occupation:						
Professional	0.055	0.229	0.061	0.239	0.044	0.205
Clerical or sales	0.135	0.342	0.136	0.343	0.133	0.339
Skilled	0.639	0.480	0.652	0.477	0.613	0.487
Mother's age	37.906	5.098	37.509	5.126	38.746	4.938
South	0.228	0.419	0.218	0.413	0.249	0.433
Interview date:						
July 1918	0.018	0.133	0.015	0.121	0.025	0.155
August 1918	0.130	0.337	0.143	0.351	0.102	0.303
September 1918	0.122	0.327	0.125	0.331	0.115	0.319
October 1918	0.229	0.420	0.237	0.425	0.210	0.408
November 1918	0.087	0.282	0.072	0.259	0.119	0.324
December 1918	0.205	0.404	0.205	0.404	0.205	0.404
January 1918						
City industrial mix index	0.006	0.001	0.006	0.001	0.006	0.002
Fraction female in 12-16 age group in household	0.509	0.458	0.586	0.468	0.346	0.389
Number of Observations	2,280		732		1,548	

Notes: Excluded categories are as follows: for household member categories: females, ages 17 and older; for father's occupation: unskilled; for interview date: February 1918.

Table 2.— First Stage Regression Model for the Share of Income from Children

	Coefficient	Standard error
City industrial mix index	4.1964	2.3850
Fraction female in 12-16 age group in household	-0.0089	0.0133
City industrial mix * fraction female	1.9115	1.5719
Log of per capita total expenditures	0.1596	0.0925
Squared log of per capita total expenditures	-0.0108	0.0084
Log family size	0.0912	0.0118
Proportion of household members:		
Male, ages 0-5	0.1185	0.0252
Female, ages 0-5	0.0615	0.0278
Male, ages 6-11	0.0739	0.0193
Female, ages 6-11	0.0623	0.0210
Male, ages 12-16	0.3769	0.0356
Female, ages 12-16	0.2775	0.0363
Male, ages 17 or older	0.0853	0.0432
Father's occupation:		
Professional	-0.0320	0.0079
Clerical or sales	-0.0198	0.0066
Skilled	-0.0245	0.0060
Mother's age	0.0014	0.0003
South	0.0069	0.0066
Interview date:		
July 1918	-0.0029	0.0127
August 1918	-0.0039	0.0133
September 1918	-0.0163	0.0133
October 1918	-0.0104	0.0129
November 1918	-0.0063	0.0142
December 1918	-0.0020	0.0130
January 1918	-0.0005	0.0133
Constant	-0.8395	0.2709
R-squared		0.205
Partial R-squared of instruments		0.011
F-statistic for instruments		6.62
Number of observations		2,280

Notes: Standard error estimates were corrected for clustering by city.

Table 3.—Coefficients on Children’s Income Share in Engel Curve Models

	OLS	IV
Father’s clothing	-0.023** (0.007)	-0.161** (0.065)
Mother’s clothing	-0.022** (0.006)	-0.044 (0.074)
Clothing for children, ages 12-16	0.095** (0.009)	-0.202* (0.120)
Clothing for children, ages < 12	-0.006 (0.005)	-0.149** (0.053)
Food at home	-0.009 (0.019)	0.970** (0.354)
Meals eaten outside the home	0.023** (0.010)	-0.099 (0.079)
Alcohol and tobacco	0.013* (0.007)	-0.094 (0.103)
Entertainment	0.002 (0.005)	-0.069 (0.053)
Books and Schooling	-0.011** (0.004)	-0.060* (0.03)
Fuel	-0.003 (0.006)	0.070 (0.106)
Other expenditures	-0.057** (0.019)	-0.299 (0.359)

Note: Standard errors in parentheses. The standard errors have been corrected for clustering by city.
* significant at a 10% level; ** significant at a 5% level.

Table 4.--Predicted Budget Shares and Expenditures for Three Hypothetical Households

	<u>Household #1</u>		<u>Household #2</u>		<u>Household #3</u>	
	\$1,216		\$1,216		\$1,362	
Total Expenditures:	0%		12%		12%	
Children's share of income:	Share	Exp.	Share	Exp.	Share	Exp.
Father's clothing	0.060 (0.004)	73.05	0.041 (0.005)	49.52	0.043 (0.005)	58.70
Mother's clothing	0.048 (0.004)	58.64	0.043 (0.006)	52.26	0.046 (0.006)	62.60
Clothing for children, 12-16	0.070 (0.007)	84.88	0.046 (0.010)	55.46	0.048 (0.009)	64.76
Clothing for children, < 12	0.047 (0.003)	57.20	0.029 (0.005)	35.41	0.030 (0.005)	40.80
Food at home	0.437 (0.019)	530.92	0.553 (0.028)	672.53	0.529 (0.026)	721.05
Meals eaten out	0.013 (0.006)	15.90	0.001 (0.008)	1.42	0.003 (0.007)	4.39
Alcohol	0.019 (0.006)	23.32	0.008 (0.008)	9.55	0.008 (0.008)	11.26
Entertainment	0.011 (0.003)	13.03	0.019 (0.004)	23.14	0.021 (0.004)	28.33
Books and Schooling	0.022 (0.003)	26.42	0.014 (0.004)	17.60	0.015 (0.004)	20.40
Fuel	0.060 (0.009)	72.53	0.068 (0.011)	82.69	0.065 (0.011)	87.89
Other expenditures	0.214 (0.017)	260.11	0.178 (0.027)	216.43	0.192 (0.026)	261.73

Note: Standard errors in parentheses. Predictions were calculated using the IV estimated models and setting all control variables to their mean values for the sample.

Table 5.—Coefficients on Children’s Income Share in Engel Curve Models for Components of Food Expenditures

	Mean share	OLS	IV
"Starchy"	0.113 [0.042]	0.011 (0.009)	0.091 (0.119)
"Meaty"	0.147 [0.045]	-0.004 (0.012)	0.378 (0.232)
"Fatty"	0.058 [0.021]	-0.003 (0.006)	0.297** (0.104)
"Milky"	0.055 [0.029]	-0.017** (0.008)	0.188* (0.112)
"Sugary"	0.022 [0.009]	0.002 (0.002)	0.021 (0.018)
"Flavorous"	0.079 [0.024]	0.003 (0.067)	0.004 (0.085)

Note: Standard deviations in brackets; standard errors in parentheses. The standard errors have been corrected for clustering by city.