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# Unitary versus Collective Models of the Household

## Time to Shift the Burden of Proof?

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A case for shifting from the unitary to the collective model of the household --- in which the household may be viewed as a factory in which individuals are motivated at times by altruism, at times by self-interest, and often by both.



## Summary findings

Until recently, most economists viewed the household as a collection of individuals who behave as if in agreement on how best to combine time and goods (purchased or produced at home) to produce commodities that maximize some common welfare index. This model has been extended far beyond standard demand analysis to include the determinants of health, fertility, education, child fostering, migration, labor supply, home production, land tenure, and crop adoption.

The appeal of the "unitary model" is the simplicity of comparative statics generated and the diversity of issues it can address. But, argue the authors, its theoretical foundations are weak and restrictive; its underlying assumptions are of questionable validity; it has not stood up well to empirical testing; and it ignores or obscures important policy issues.

They argue that economists should regard households as "collective" rather than unitary entities. They make a case for accepting the collective model (with cooperative and noncooperative versions) as the

industry standard — with caveats. The unitary model should be regarded as a special subset of the collective approach, suitable under certain conditions. The burden of proof should shift to those who claim the unitary model as the rule and collective models as the exception.

Implicit in the authors' argument is the view that household economics has not taken Becker seriously enough. "A household is truly a 'small factory,'" wrote Becker (1965). "It combines capital goods, raw materials, and labor to clean, feed, procreate, and otherwise produce useful commodities." The authors, too, perceive the household as a factory, which, like all factories, contains individuals who — motivated at times by altruism, at times by self-interest, and often by both — cajole, cooperate, threaten, help, argue, support, and, indeed, occasionally walk out on each other. Labor economists and industrial organization theorists have long exploited the value of going inside the "black box" of the factory. It is time to do the same for household economics, say the authors.

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**UNITARY VERSUS COLLECTIVE MODELS OF THE HOUSEHOLD:  
TIME TO SHIFT THE BURDEN OF PROOF?**

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## UNITARY VERSUS COLLECTIVE MODELS OF THE HOUSEHOLD: TIME TO SHIFT THE BURDEN OF PROOF?

### INTRODUCTION

Until fairly recently, most economists have viewed the household as a collection of individuals who behave as if they are in agreement on how best to combine time, goods purchased in the market, and goods produced at home, to produce commodities (sometimes referred to as 'Z-goods') that maximize some common welfare index. This model has been extended far beyond standard demand analysis to include the determinants of education, health, fertility, child fostering, migration, labor supply, home production, land tenure, and crop adoption.

This approach, which we call the unitary model, is appealing because of the relative simplicity of comparative statics generated and the diversity of issues it can address. Moreover, it is not inconsistent with differences in individual welfare within a household, even when these differences are exhibited systematically by some gender, age, or relation to household head grouping. Why, then, should questions arise about its use? This paper, drawing on a wide range of literature that has developed in the last 10 years, argues that the unitary household model has two weaknesses: (a) its

theoretical foundations are restrictive, and (b) it has been empirically refuted in a number of settings.

The weaknesses are not merely academic, they have important policy implications. First, the unitary model implies that it does not matter to whom policy initiatives are directed: given information sharing, the response to that policy will be recipient-independent. This focus on only one or two economic agents within the household has led to both policy non-adoption and the generation of unintended adverse impacts from policy adoption. Second, the unitary model depicts as impotent a number of policy initiatives which do not directly affect the technology of Z-good production and do not affect household preferences. In other words, the unitary model can lead to policy failures which reflect a failure to understand the long reach of some public interventions. Examples are provided in the penultimate section of this paper.

Given these considerations, we suggest a shift in emphasis; collective models of household behavior should be regarded as the standard approach, with the unitary model being regarded as a special case. Below, we set these issues out in more detail. Additional discussion of the points we raise, with further references, can be found in Chiappori (1992b); Haddad, Hoddinott, and Peña (1992); Hoddinott (1992a); and McElroy (1992).

## UNITARY AND COLLECTIVE MODELS OF HOUSEHOLD BEHAVIOR

### The Unitary Model

The standard approach to modelling household behavior assumes the existence of a household welfare function that aggregates the preferences of all members. Maximizing this function, subject to the appropriate budget constraint, yields demand functions for goods, broadly defined, and leisure. We call this the 'unitary model.' This model is sometimes called the 'common preferences' model or the 'altruism' model or the 'Benevolent Dictator' model. We call it the unitary model because this label describes how the household acts (as one). Other labels tend to reflect the manner in which the household is hypothesized to act as one. For instance, common preferences are only one way in which the household can act as one; spouse abuse is another. 'Altruism' has also been used to explain why households might behave as one individual, but as we shall see later, it is altruism under very restrictive conditions.

The existence of a household welfare function reflecting the preferences of all members is by no means an innocuous assumption; its compatibility with individualism may be problematic. Individual household members are likely to have different preferences. Accordingly, the existence of a household welfare function requires that these differing preferences be aggregated. The vast social choice literature illustrates the theoretical difficulties associated with this. Also, an immediate but important consequence of the unitary approach is the pooling of all household resources (capital,

labor, and land). From an individualistic viewpoint, the pooling of all resources requires that at least one household member has the ability to monitor its members and to sanction those who fall foul of its rules.

A strong feature of the unitary model is its ability to explain two aspects of household behavior: decisions regarding the quantity of goods consumed and the allocation of those goods amongst household members. For example, Pitt, Rosenzweig, and Hassan (1990) extend the agricultural household model by incorporating individual work effort as a choice variable in the household welfare function. They suggest that unequal calorie allocations across gender and age classes may reflect different distributions of activities within those classes. The reasoning is that, given a household welfare function, (a) if men are more likely than women to undertake energy-intensive activity, and (b) if productivity (pecuniary returns) in those activities is responsive to health and effort, it makes sense for the household to allocate marginal calories to healthy men. In this way, the marginal utility gained by the household from allocating calories to an individual, standardized by the cost to the household of allocating calories to that individual, is equalized across household members (first order conditions for household welfare maximization). Pitt, Rosenzweig, and Hassan find support for the hypothesis that intrahousehold food allocation reflects the different energy-intensive activities undertaken by men and women.

However the existence of differentials across household members in calorie intakes—even after standardizing by activity patterns—does not necessarily invalidate the unitary model. These inequalities could be generated by different perceptions of energy intake and need or simply because the household decides that it prefers well-fed men to well-fed women. However, a number of commentators have found it difficult to reconcile the unitary model with these types of systematic differences in welfare within households. As Folbre (1986, 251) comments:

The suggestion that women and female children 'voluntarily' relinquish leisure, education, and food would be somewhat more persuasive if they were in a position to demand their fair share. It is the juxtaposition of women's lack of economic power with the unequal allocation of household resources that lends the bargaining power approach much of its persuasive appeal.

### Collective Models

Collective models take as given the individuality of household members. In the existing literature, there are two broad types of collective model: cooperative and noncooperative. As we shall see below, the unitary model can be seen as a special case of this more general class of models.

The noncooperative approach (Ulph 1988; Kanbur 1991; Katz 1992; Lundberg and Pollack 1992) relies on the assumption that individuals cannot enter into binding and enforceable contracts with each other. Instead, individuals' actions are conditional on the actions of others. For example, in Katz's 'Reciprocal Claims' model, the household is "depicted as a site of largely separate gender-specific economies linked by reciprocal claims on members' income, land, goods, and labor." A wife's budget is delinked from her husband's; wives respond to changes in their husband's allocation of his labor solely according to their own needs.

In the cooperative approach, individuals have a choice of remaining single or of forming a household. They choose the latter option when the utility levels associated with being married outweigh the utility derived from being single. For example, there may be economies of scale associated with the production of certain household goods, or there may be some goods that can be produced and shared by married couples but not single individuals. Household formation may generate intangible benefits such as 'love' or 'companionship.' In any case, the existence of the household generates a surplus, which will be distributed across the members; of course, the rule governing this distribution is a central issue of the analysis.

Starting from this common framework, two subclasses of models have emerged. Models of the first category only suppose that household decisions are always efficient in the (usual) Pareto sense. In particular, nothing is assumed a priori about the nature of the

decision process, or, equivalently, about the location of the final outcome on the household Pareto frontier. This does not mean that the rule of repartition governing intrahousehold allocation is nonessential, but rather that it has to be estimated from the data rather than postulated a priori. This more general viewpoint is especially convenient for assessing the relative relevance of the competing frameworks. In particular, an important finding is that the efficiency hypothesis is sufficient to generate strong testable restrictions upon household behavior (Chiappori 1992b).

Models of the second subclass go one step further, by representing household decisions as the outcome of some bargaining process, and applying to this framework the tools of cooperative game theory. Then the division of the gains from marriage can be modelled as a function of the 'fallback,' or 'threat point' position of each member; itself a function of extra-environmental parameters (EEPs). These include sex ratios in marriage markets, laws concerning alimony and child support, changes in tax status associated with different marital states, and, in developing countries, the ability of women to return to their natal homes and prohibitions on women working outside the home (McElroy 1990, 1992). The vast majority of 'bargaining' models rely on a Nash solution. This is justified by results due to Binmore, Rubinstein, and Wolinsky (1986) and Harsanyi and Selten (1988), indicating that the Nash cooperative solution emerges from a

number of noncooperative frameworks.<sup>1</sup> Figure 1 presents a diagrammatic taxonomy of collective household models.

There are several general aspects of the collective approach that are worth further comment. It would be desirable if the outcome of intrahousehold bargaining was pareto optimal. This is satisfied by definition for cooperative models; in particular, the general restrictions alluded to above also apply to Nash bargaining frameworks. However, as is well known, efficiency does not always hold in the case of noncooperative models. Second, an appealing feature of the rotten kid theorem is its resolution of enforcement problems. In bargaining models, this can be resolved via the threat of household dissolution, but as McElroy (1992) notes, "in the context of small daily decisions, it is not credible for either spouse to threaten divorce." McElroy suggests that decisions regarding short-run issues can be motivated by time preferences as in work by Binmore, Rubinstein, and Wolinsky (1986). Here, the noncooperative solution acts as the threat point.

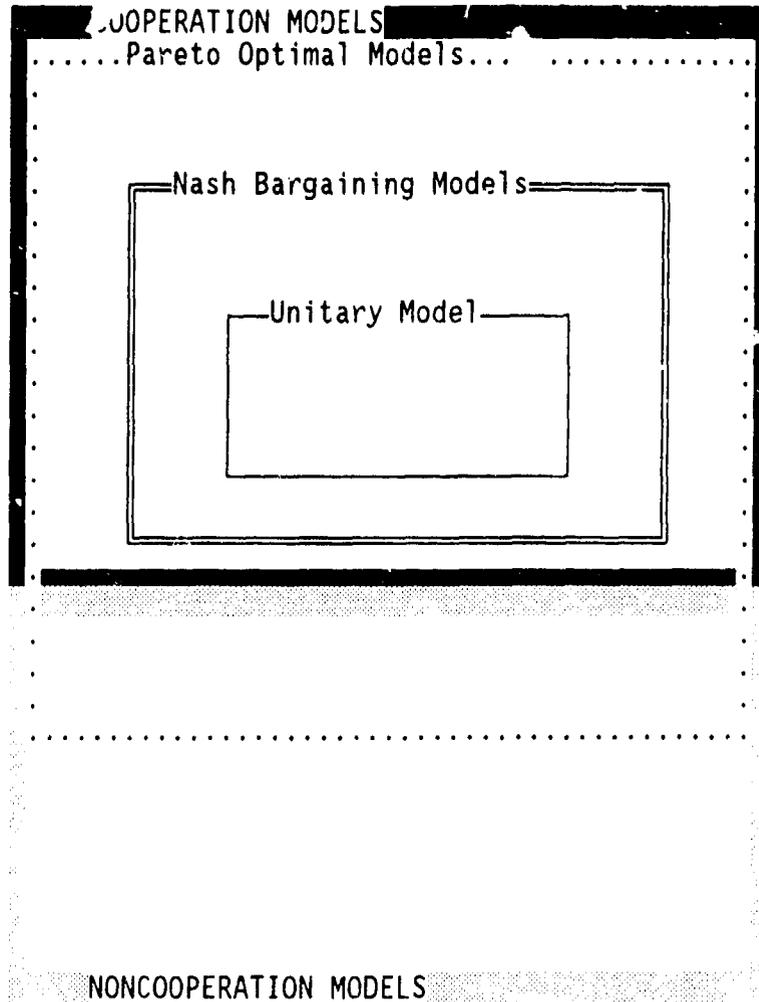
#### CASTING DOUBTS ON THE UNITARY MODEL—THEORY

We now turn to a closer examination of the unitary model. As indicated above, the unitary model requires the aggregation of preferences and the pooling of household resources.

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<sup>1</sup> We owe these references to McElroy (1992).

Figure 1—Models of the household



At the household level, Samuelson (1956) suggested that this aggregation could be achieved via a consensus amongst members. However, this does not indicate how such a consensus is reached. Nor does it explicitly address the problems of monitoring and incentives. An alternative approach could be based on Sen's (1966) model of cooperatives. Here, family welfare is the weighted sum of the net utility of all members. But in the absence of a dictator, or 'symmetric sympathy,' it is unclear how these weights are determined. While they could be the outcome of a voting scheme, there are a wide range of circumstances under which this fails to generate a unique ordering of preferences (Sen 1986). Another weakness of this justification is that the corresponding aggregate index will not be equivalent to a utility function, unless it does not depend on prices and incomes. Ruling out a priori any effect of incomes upon intrahousehold weights is a very strong assumption, difficult to justify on a theoretical basis.

The strongest justification for the unitary model is put forward by Becker (1974, 1981) in the 'rotten kid theorem.' Becker considers the case of a household with two members, a benefactor and a recipient. The recipient is selfish in that he/she derives utility solely from his own consumption. The benefactor, as an altruist, can increase his/her own utility by transferring some of his own consumption to that of the recipient. Now suppose the recipient undertakes some action that raises his/her own consumption but lowers that of the benefactor. The benefactor could respond by lowering

his/her transfers to the recipient, so much so that the recipient's new level of consumption is below his/her original level. Consequently, the recipient will not behave rottenly in the first place.

The rotten kid theorem resolves the problems of aggregation and enforcement. The preferences of the altruist become the preferences of the household; the household's maximand becomes the utility function of the altruist. However, the rotten kid theorem only holds under restrictive circumstances: (a) the recipient's consumption can be neither an inferior nor a luxury good—otherwise the threat of reduced transfers may not be credible over all levels of consumption; (b) any attempt to disrupt the benefactor's desired distribution of consumption is 'small.' That is, a kid could not be so rotten that he reduces the altruist's consumption below his initial endowment while raising his own above its previous (endowment plus transfer) level. Not only must the resources of the altruist be larger than any one individual, they must also be larger than any coalition of household members. If this was not the case, it may be possible for a group of individuals to behave rottenly together, increasing their collective consumption at the expense of others.

King Lear and the importance of having the last word (Hirshleifer 1977), the Samaritan's Dilemma (Bernheim and Stark 1988; Bruce and Waldman 1990), and lazy rotten kids and controversial night-lights (Bergstrom 1989) are further examples where the rotten kid theorem is violated. In these cases, the introduction of a second commodity (for

example, consumption today and consumption tomorrow) makes it profitable for the recipient to choose an action that enhances his/her utility at the expense of the benefactor. Bergstrom (1989) has generalized these results, and has shown that the rotten kid theorem only holds where the preferences of every household member can be represented by a utility function yielding transferable utility—again, a very strong assumption.

#### CASTING DOUBTS ON THE UNITARY MODEL—EVIDENCE

We now turn to a brief review of the empirical literature. We begin with the 'informal evidence.' This material is not necessarily nested within a formal test procedure, but nevertheless casts doubt upon certain aspects of the unitary model.

##### Informal Evidence

A large number of studies, from several disciplines, from both developed and developing countries, indicate that income is not pooled within a household. Instead, households adopt a variety of income sharing arrangements (Pahl 1983)—including the 'whole wage' system (one person manages all finances and expenditures except for personal spending money); the 'allowance' or 'spheres of responsibility' system (for example, a husband gives his wife a set amount for purchasing specified commodities); the 'shared management' system (all incomes are pooled); and the 'independent management' system (each individual has their own income and is responsible for certain expenditures, and

neither has access to all household funds). A consequence, though perhaps not a surprising one, is that differential control of income translates into different patterns of expenditures. It is widely perceived, and again supported by a mass of case study material, that relative to women, men spend more of the income under own-control on their own consumption. Alcohol, cigarettes, status consumer goods even 'female companionship' are noted in these studies. By contrast, women are more likely to purchase goods for children and for general household consumption.

Another class of informal evidence relates to domestic violence. There is considerable evidence that domestic violence is prevalent in both developed and developing countries (Heise 1992). This evidence might appear tangential to issues of household modelling, but we believe that this is not the case. Altruism is a necessary component of the rotten kid theorem which, as discussed above, is the most plausible justification for the unitary household model. The fact that domestic violence is widespread calls into question the ubiquity of this assumption. Moreover, domestic violence can be readily incorporated into a collective model of household behavior.

Is this informal evidence persuasive? We note two points. First, much of the case study material is supported by econometric analysis—see Hoddinott and Haddad (1991) for evidence regarding the relationship between gender-specific income and expenditures, and Tauchen, Witte, and Long (1991) for an analysis of domestic violence. Second, the unitary model cannot be defended on the basis of the

validity of its assumptions—these, to use Rosenzweig's (1986, 233) phrase, "do violence to reality." This leaves two choices. If one adopts a Samuelsonian position ("if the abstract models contain empirical falsities, we must jettison the models, not gloss over their inadequacies," [Samuelson 1963, 236]) the unitary model cannot be regarded as anything more than an interesting special case.

Alternatively, one can fall back on a Friedman-type view: "a theory is vindicable if its consequences are empirically valid to a useful degree of approximation; the (empirical) unrealism of the theory 'itself,' or its 'assumptions,' is quite irrelevant to its validity and worth" (Samuelson 1963, 232). That is, the unitary model should be judged on the accuracy of its predictions, not the realism of its assumptions. We now turn to these.

### Formal Evidence

We survey two kinds of 'formal' evidence. On the one hand, several restrictions of the unitary model do not hold when tested empirically. Three are considered here: cross-substitution effects on labor supply; nonpooling of nonlabor income; and strategic behavior in the context of intergenerational relations. On the other hand, comparative tests of the collective and unitary approaches seem to favor the former framework.

In the context of labor supply decisions, the unitary model implies that cross substitution effects must be equal—that is, "the effect of an income-compensated increase in the husband's wage on the

wife's labor supply must be identical to the effect of an income-compensated increase in the wife's wage on the husband's labor supply" (Lundberg 1988, 225). Existing evidence from the United States (Ashenfelter and Heckman 1974) rejects the equality of these effects. Further, using panel data to control for unobserved fixed effects, Lundberg (1988) rejects the hypothesis that husband's and wife's labor supply are jointly determined, as predicted by the unitary model.<sup>2</sup>

A key assumption of the unitary model is the pooling of household income. This implies that the identity of the individual earning the income has no effect on the household demand for goods and leisure. Direct tests of this assumption are problematic because of the endogeneity of income. Schultz (1990) and Thomas (1990, 1992) avoid this difficulty by focusing on unearned income. As Schultz (1990, 601-602) notes,

If non-earned income (or ownership of the underlying asset) influences family demand behavior differently, depending on who in the family controls the income (or owns the asset), then the preferences for that demand must differ across individuals and such families must not completely pool unearned income.

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<sup>2</sup> More generally, the symmetry of the Slutsky matrix is generally rejected by empirical works.

Thomas (1992) finds that increased (nonlabor) income held by women leads to a greater share of the household budget devoted to expenditures on human capital and a higher level of nutrient intake.

In the context of intergenerational transfers, the unitary model implies that benefactors have no incentive to behave strategically—that is, to manipulate intentionally the behavior of the recipient. In other words, rotten kids do not attempt to raise their consumption at the expense of others, because the altruistic benefactor will automatically reduce the size of the transfers made to them. This hypothesis is testable. If Becker's model holds, we should not find evidence of benefactors behaving strategically, for example, using bequests to obtain attention or monetary transfers from their offspring. Bernheim, Shleifer, and Summers (1985) develop a noncooperative bargaining model incorporating this possibility. They find that bequeathable wealth is strongly positively correlated with attention, as measured by visits and telephone calls. Lucas and Stark (1985) and Hoddinott (1992b) obtain comparable results, finding that increased holdings of inheritable assets lead to higher monetary transfers from nonresident members in Botswana (Lucas and Stark) and from sons who anticipate receiving an inheritance in western Kenya (Hoddinott).

Lastly, recent work has emphasized the existence of empirical tests characterizing the 'collective' approach. Chiappori (1988, 1992a) derives restrictions on labor supply in a model where consumption and leisure are private goods. Fortin and Lacroix (1993)

estimate a general model of labor supply in which both the "unitary" and the collective framework can be tested as special cases. They find that, while the unitary restrictions are strongly rejected, the collective are not.

In the case of general demand systems, the Slutsky matrix  $\Sigma$ , in the unitary framework, must be symmetric, whereas the collective approach implies that  $\Sigma$  can be written as the sum of a symmetric and a rank one matrices (Browning and Chiappori 1992). Also, though collective models are compatible with the absence of 'income pooling,' as discussed above, the efficiency assumption strongly restricts the way in which different income sources may influence consumption patterns (Bourguignon, Browning, and Chiappori 1992). A preliminary test of the latter restrictions is provided by Bourguignon et al. (1992a, 1992b). In both papers, a general model is constructed that encompasses both the unitary and the collective frameworks as special cases. While the unitary restrictions are strongly rejected in both cases, the collective ones are not. Even more interesting is the comparison, in the second paper, between a sample of couples and two subsamples of singles: the unitary restrictions are rejected for the former, but not for the latter.

#### POLICY IMPLICATIONS OF RELYING ON THE UNITARY MODEL

Should policymakers simply ignore issues relating to intrahousehold resource allocation? Is the distinction between

unitary and collective models merely an arcane academic curiosity? We argue that the answer to both questions is no.

With respect to the first question, consider the following example. Suppose there is concern regarding the well-being of young girls in a particular rural area; specifically, there is a perception that they do not get enough food to eat. A possible policy response is the implementation of a school meals program. However, the success of this intervention cannot be ascertained in the absence of information on how households allocate food amongst their members. Households might respond to this program by reducing the amount of food girls receive at home (and increasing the amount of food consumed by other household members). Understanding how households alter the intrahousehold allocation of resources is a necessary prerequisite in determining the effectiveness of such policy interventions (Haddad and Kanbur 1992a).

A second example of the possible policy errors induced by ignoring intrahousehold issues is the measurement of poverty and inequality. Consider a country where transfer payments are made from a central government to provincial or state authorities. The size of these transfers is a function of estimated levels of poverty. Does it matter if poverty is measured with reference to households or to individuals? If resources are equally distributed amongst members, either measure will yield the same estimate of the degree of poverty. However, as Haddad and Kanbur (1990) demonstrate, this no longer holds if resources are unequally allocated within the household. Drawing on

individual- and household-level data on caloric availability in the Philippines, they estimate the incidence of poverty using the  $P(\alpha)$  class of poverty measures proposed by Foster, Greer, and Thorbecke (1984). Using an income gap poverty measure ( $\alpha=1$ ), they find that ignoring intrahousehold inequality understates poverty by 18-23 percent. They note that their results are dependent on the poverty measure used, and that the pattern of poverty across socioeconomic groups. However, their general result, that measures of the degree of poverty are sensitive to intrahousehold inequality, is of clear policy relevance.<sup>3</sup>

A less clear-cut question is whether the analytical complexity associated with collective models of household behavior offer any additional insights for policymakers. We suggest four areas where the choice of model matters. The first concerns the effect of public transfers made to the household. The unitary model predicts that the impact of such transfers is unaffected by the identity of the recipient. Second, at a project level, the unitary model implies that it does not matter to whom policy initiatives are directed. Given information sharing, the response to that policy will be recipient-independent. This gives rise to two potential policy failures: (i)

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<sup>3</sup> Becker (1988) considers a number of other policy issues, including growth and the intergenerational transmission of inequality, where an understanding of the intrahousehold allocation of resources is important.

the nonadoption of particular policies; and (ii) unintended costs arising from policies that are adopted. Below, we illustrate nonadoption and unintended policy consequences through attempts to facilitate the adoption of new technology in developing countries. (Other areas such as targeting and environmental degradation are discussed in Haddad, Hoddinott, and Peña [1992]). Third, the unitary model depicts as impotent a number of policy initiatives which neither directly affect the technology of Z-good production nor affect household preferences. Finally, the nature of interactions between household members will determine whether public transfers are mitigated or enhanced by changes in private behavior.

As discussed in the previous section, the claim that household decisions are independent of the identity of the individual earning income has been refuted in a number of settings. This has obvious implications for policy as illustrated by the following quotations:

Many participants in the public debate concerning actual government transfers take it for granted that intrafamily distribution will vary systematically with the control of resources. When the British child allowance system was changed in the mid-1970s to make child benefits payable in cash to the mother, it was widely regarded as a redistribution of family income from men to women and was expected to be popular with women (Lundberg and Pollack 1992).

Indeed, so convinced did some Ministers become that a transfer of income 'from the wallet to the purse' at a time of wage restraint would be resented by male workers, that they decided at one point in 1977 to defer the whole child benefit scheme (Brown 1984, cited in Lundberg and Pollack 1992).

There are a number of examples of the nonadoption of policies designed to improve crop technology.<sup>4</sup> Jones (1986), summarized in Dey (1992), reports the results of a project in Cameroon to encourage women to produce rice. In the study area, rice was considered to be a male crop. Any income generated from it would have been controlled by men, even if the crop was produced by women. Consequently, few women entered into rice cultivation. Instead, they continued to grow sorghum, despite its lower returns, because they controlled the harvested product.

However, targeting an initiative to the correctly-identified most in-need group does not necessarily diminish the probability of adverse unintended impacts. An example of this second type of resource misallocation—unanticipated impacts of the adoption of a new technology—is provided by the work of von Braun and Webb (1989) in The Gambia. In the early 1980s, rice irrigation was introduced to an area of swamp rice production in order to raise yields, commercialize

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<sup>4</sup> Also see Poats (1991) and Gladwin and McMillan (1989).

the product, and raise women's share of household income. However, an initiative intended to raise female income shares ended up reducing them. Previously, women were the rice growers. Yield increases transformed the status of rice from a private crop under the control of women into a communal crop under the control of men. Prior knowledge of the relative bargaining positions of men and women would have helped predict the outcome and enabled program redesign to meet the original goals.<sup>5</sup>

The third policy failure induced by the unitary model is the failure to predict the consequences for intrahousehold resource allocation of policy measures that affect neither the technology of Z-good production nor household preferences. An example of this issue particularly relevant to developing countries is that of common property resource (CPR) management schemes, such as access to common grazing land.<sup>6</sup>

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<sup>5</sup> Dey (1992) reports that more recent attempts by donors funding this project to safeguard women's access to land were frustrated by the manager's of the project, who sided with male household heads in disputes over access to land. Attention to intrahousehold considerations is necessary to avoid such unforeseen policy failures, but as this example makes clear, it may not be sufficient.

<sup>6</sup> This example also applies to changes in laws concerning alimony and child support, the ability of women to return to their natal homes, and prohibitions on women working outside the home.

Haddad and Kanbur (1992b) outline the following model. Within a household, there are two individuals, each with access to a production function that produces output as the result of two task inputs. There is comparative advantage in the tasks, so it pays to cooperate and specialize in tasks. But how are the gains from cooperation to be divided? Suppose that the fallback option for each individual is identified with the outcome of working alone. Now, suppose that the government introduces a scheme that guarantees better access for all to common property resources. How will this affect intrahousehold inequality, and, in particular, the well-being of the individual with poorer pre-intervention access? If the income generated from improved access is higher than what the women could previously earn on their own, but is still less than the income from cooperation, then even though the common property is not actually used, more equitable access actually improves intrahousehold equality. What is remarkable is that the scheme has a long reach—it equalizes intrahousehold allocation by altering outside options, despite those options not being taken up.

Of course, the credibility of the guaranteed access is at the heart of the matter, and this brings the issue back to some of the policy debates on the extent of access to CPRs. If rationing limits the ability of women to raise their fallback utility, then there will not be an impact on intrahousehold allocation. Other intrahousehold allocation issues also come into play—if improved access is only guaranteed for married women, the threat points outside the marriage are unaffected by the policy choice. Improved access to CPRs for

women outside as well as inside marriage will result in CPR reforms which are better able to improve intrahousehold resource allocation.

In the initial discussion of policy issues, we noted that changes in private behavior may offset public transfers. In models such as Barro (1974), altruism on the part of private agents undoes the effect of government policies which increase the incomes of the current generation at the expense of future generations. If intergenerational altruism is replaced with exchange motives, this result no longer holds. In a developing country context, the following, somewhat contrived example (adapted from Cox and Jimenez [1990]) illustrates this feature. Consider a hypothetical family with young members residing in towns and old members living in rural areas. Transfers are made by the altruist 'young' to the old, and individual consumption is a function of aggregate income. Suppose a social security program is introduced that taxes the young and subsidizes the old, leaving aggregate income unchanged. This might well lead to a reduction in urban-rural remittances, with consumption of individual members unchanged. However, suppose that these young-to-old transfers are undertaken in exchange for some in-kind service (such as looking after cattle). The transfer would be an amount equal to what the recipient would have received working as a casual laborer. An urban wage tax (the social security program) is introduced, with the proceeds used to subsidize rural wages. As a result, the urban household members must transfer *higher* amounts to their elders because the opportunity cost of looking after the cattle has increased. This

is the opposite result of that predicted by the altruistic unitary model.

#### CAVEATS TO COLLECTIVE MODELS

Collective models of household behavior have four strengths: they address the issue of preference aggregation; they have empirically distinguishable predictions; they highlight important policy considerations; and they are supported by a diverse set of empirical tests. However, there are several caveats worth noting.

First, caution is required in interpreting a number of results supporting collective models of household behavior:

1. Browning and Chiappori (1992) test a pareto efficient model using Canadian family expenditure data. Specifically, they focus on purchases made by singles and childless couples in full-time employment. There may be selectivity problems with such samples. Standard approaches to dealing with this are problematic because of the difficulty of finding variables that determine the likelihood that individuals form certain types of households but do not affect other household decisions. (A similar criticism applies to Hoddinott and Haddad's (1991) comparison of expenditure patterns of all adult male and all adult female households in the Côte d'Ivoire.)
2. The papers by Schultz (1990) and Thomas (1990, 1992) use non-labor income to test the income pooling hypothesis. Two objections to this approach can be made. First, non-labor income

may reflect unobserved productivity heterogeneity.<sup>7</sup> Second, the reporting of non-labor income is particularly prone to reporting and measurement error, with all the usual consequences for econometric testing.

3. Extra-environmental parameters represent a means of testing cooperative theories against the unitary model, and distinguishing between cooperative and noncooperative approaches (Lundberg and Pollack 1992). However, these are unlikely to vary much in cross-section data, and where such variation exists, unobserved differences in community characteristics may be a legitimate explanation of any significant effects; and
4. Collective models of intergenerational relations (such as Bernheim, Shleifer, and Summers [1985] and Hoddinott [1992b]) assume that the number of children, their education, and earnings are exogenous. Yet as the literature summarized in Behrman (1992) makes abundantly clear, child quality and quantity is the outcome of parental decisionmaking, a feature ignored in empirical tests of these models.

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<sup>7</sup> Deaton (1992) notes that empirical studies of labor supply in the early 1970s found a positive relationship between non-labor income and hours worked, although basic micro theory predicts the opposite effect. One explanation is that harder working people may be more productive and, hence, better able to acquire assets and non-labor income.

Second, the comparative statics of most collective models take the operations of the marriage market as exogenously determined. Relaxing this assumption alters the impact of policy changes on household behavior. Lundberg and Pollack (1992) consider the impact of payment of child allowances to women. Using a cooperative model, they show that such a scheme will initially improve the intrahousehold distribution of resources in favor of women. But suppose that household formation is preceded by some form of binding agreement (such as a prenuptial contract) which includes the promise of transfers from husband to wife. Once the new child allowance scheme is in place, one might expect that husbands would reduce their transfers. As Lundberg and Pollack (1992, 21) note,

with binding transfers, the distributional effect of a policy changing the recipient of child allowances will, therefore, persist only within marriages in existence at the time of the policy change. For subsequent generations of marriages, adjustments in prenuptial transfers will exactly offset the shift in child allowances.

Finally, Sen (1985) notes that bargaining amongst members is also a function of their *perceived* contribution to the household. The individual perceived as making the larger contribution can expect to obtain an outcome more favorable to him or her. This may place women at a particular disadvantage, as much of their contribution may take

the form of nonmarket labor, which is less visible than wage employment. The distinction between actual and perceived behavior is rarely made in collective models of household behavior. Woolley (1992) is a recent exception.

## CONCLUSIONS

In this paper, we have argued that economists should regard households as 'collective' rather than 'unitary' entities. We have argued that the theoretical foundations of the unitary model are weak; that its underlying assumptions are of questionable validity; that it has not stood up well to empirical testing; and that it ignores or obscures important policy issues. Though caution is warranted in interpreting the evidence that has accumulated over the past decade, there is a strong argument for setting the collective model as the industry standard. In making this claim, our intention is not to discard the unitary model in its entirety. Rather, we argue that it should be regarded as a special subset of the collective approach, suitable when certain specified conditions hold. The burden of proof should shift onto those who would claim that the unitary model is the rule and collective models, the exception.

Implicit in our argument is a view that household economics has not taken Becker (1965) seriously enough. In 1965, Becker wrote, "A household is truly a 'small factory': it combines capital goods, raw materials, and labor to clean, feed, procreate, and otherwise produce useful commodities." We, too, perceive the household as a factory;

but like all factories, it consists of individuals who—motivated at times by altruism, at times by self-interest, and often by both—cajole, cooperate, threaten, help, argue, support, and, indeed, occasionally walk out on each other. Labor economists and industrial organization theorists have long exploited the value of going inside the 'black box' of the factory. It is time those of us interested in household economics did the same.

## REFERENCES

- Ashenfelter, O., and J. Heckman. 1974. The estimation of income and substitution effects in a model of family labor supply. *Econometrica* 42: 73-85.
- Barro, R. 1974. Are government bonds net wealth. *Journal of Political Economy* 82: 1095-1117.
- Becker, G. 1965. A theory of the allocation of time. *Economic Journal* 75: 493-517.
- \_\_\_\_\_. 1974. A theory of social interactions. *Journal of Political Economy* 82: 1063-1093.
- \_\_\_\_\_. 1981. *A treatise on the family*. Cambridge, MA, U.S.A.: Harvard University Press.
- \_\_\_\_\_. 1988. Family economics and macro behavior. *American Economic Review* 78: 1-13.
- Behrman, J. 1992. Intrahousehold resource allocation. University of Pennsylvania, Philadelphia, PA, U.S.A. Mimeo.
- Bergstrom, T. 1989. A fresh look at the rotten kid theorem - and other household mysteries. *Journal of Political Economy* 97: 1138-1159.
- Bernheim, B. D., and O. Stark. 1988. Altruism within the family reconsidered: Do nice guys finish last. *American Economic Review* 78: 1034-1045.

- Bernheim, B. D., A. Shleifer, and L. Summers. 1985. The strategic bequest motive. *Journal of Political Economy* 93: 1045-1076.
- Binmore, K., A. Rubinstein, and A. Wolinsky. 1986. The Nash bargaining solution in economic modelling. *Rand Journal of Economics*. 17: 176-188.
- Bourguignon, F., M. Browning, and P-A. Chiappori. 1992. Identifying intrahousehold decision processes. DELTA, Paris. Mimeo.
- Bourguignon, F., M. Browning, P-A. Chiappori, and V. Lechène. 1992a. Intrahousehold allocation of consumption: A model and some evidence from French data. *Annales d'Economie et de Statistiques* 29: 137-156.
- \_\_\_\_\_. 1992b. Incomes and outcomes: A structural model of intrahousehold allocation. DELTA, Paris. Mimeo.
- von Braun, J., and P. Webb. 1989. The impact of new crop technology on the agricultural division of labor in a West African setting. *Economic Development and Cultural Change* 37 (April): 513-534.
- Browning, M., and P-A. Chiappori. 1992. Efficient intrahousehold allocations: A general characterization. DELTA, Paris. Mimeo.
- Bruce, N., and M. Waldman. 1990. The rotten-kid theorem meets the Samaritan's dilemma. *Quarterly Journal of Economics* 105: 155-166.
- Chiappori, P-A. 1988. Rational household labor supply. *Econometrica* 56: 63-89.
- \_\_\_\_\_. 1992a. Collective labour supply and welfare. *Journal of Political Economy* 100: 437-467.

- \_\_\_\_\_. 1992b. Income sharing within the household. Paper presented at the IFPRI-World Bank Conference on Intrahousehold Resource Allocation: Policy Issues and Research Methods, Washington, D.C.
- Cox, D., and E. Jimenez. 1990. Achieving social objectives through private transfers. *World Bank Research Observer* 5: 205-218.
- Deaton, A. 1992. Discussant comments on Chiappori and Thomas. IFPRI-World Bank Conference on Intrahousehold Resource Allocation: Policy Issues and Research Methods, Washington, D.C.
- Dey, J. 1992. Gender asymmetries in intrahousehold resource allocation of land and labor: Some policy implications. Paper presented at the IFPRI-World Bank Conference on Intrahousehold Resource Allocation: Policy Issues and Research Methods, Washington, D.C.
- Folbre, N. 1986. Hearts and spades: Paradigms of household economics. *World Development* 14: 245-255.
- Fortin, B., and G. Lacroix. 1993. *Test of noncooperative and cooperative models of labor supply*. Working Paper. Quebec, Quebec, Canada: Université Laval.
- Foster, J., J. Greer, and E. Thorbecke. 1984. On a class of decomposable poverty measures. *Econometrica* 52: 761-766.
- Gladwin, C., and D. McMillan. 1989. Is a turnaround in Africa possible without helping African women to farm? *Economic Development and Cultural Change*: 345-369.

- Haddad, L., and R. Kanbur. 1990. How serious is the neglect of intrahousehold inequality. International Food Policy Research Institute, Washington, D.C. Mimeo.
- \_\_\_\_\_. 1992a. The value of intrahousehold survey data for age-based nutritional targeting. *Annales d'Economie et de Statistique*. Forthcoming.
- \_\_\_\_\_. 1992b. Intrahousehold inequality and the theory of targeting. *European Economic Review* 36: 372-378.
- Haddad, L., J. Hoddinott, and C. Peña. 1992. Intrahousehold resource allocation: Policy issues and research methods. Draft report prepared for USAID, Washington, D.C.
- Harsanyi, J., and R. Selten. 1988. *A general theory of equilibrium selection in games*. Cambridge, MA, U.S.A.: Massachusetts Institute of Technology Press.
- Heise, L. 1992. Violence against women: The missing agenda. In *Women's health: A global perspective*, ed. by M. Koblinsky, J. Timyan, and J. Gray. Boulder, CO, U.S.A.: Westview Press.
- Hirshleifer, J. 1977. Shakespeare vs. Becker on altruism: The importance of having the last word. *Journal of Economic Literature* 15: 500-502.
- Hoddinott, J. 1992a. Household economics and the economics of households. Paper presented at the IFPRI-World Bank Conference on Intrahousehold Resource Allocation: Policy Issues and Research Methods, Washington, D.C.

- \_\_\_\_\_. 1992b. Rotten kids or manipulative parents: Are children old age security in Western Kenya. *Economic Development and Cultural Change* 40: 545-565.
- Hoddinott, J., and L. Haddad. 1991. *Household expenditures, child anthropometric status, and the intrahousehold division of income: Evidence from the Côte d'Ivoire*. Research Program in Development Studies Discussion Paper 155. Princeton, NJ, U.S.A.: Woodrow Wilson School of Public and International Affairs, Princeton University.
- Kanbur, R. 1991. *Linear expenditure systems, children as public goods, and intrahousehold inequality*. Discussion Paper 104. Coventry: Development Economics Research Centre, University of Warwick.
- Katz, E. 1992. household resource allocation when income is not pooled: A reciprocal claims model of the household economy. Paper presented at the IFPRI-World Bank Conference on Intrahousehold Resource Allocation: Policy Issues and Research Methods, Washington, D.C.
- Lucas, R., and O. Stark. 1985. Motivations to remit. *Journal of Political Economy* 93: 901-918.
- Lundberg, S. 1988. Labor supply of husbands and wives: A simultaneous equations approach. *Review of Economics and Statistics* 70: 224-235.

- Lundberg, S., and R. Pollack. 1992. Separate spheres bargaining and the marriage market. Paper presented at the IFPRI-World Bank Conference on Intrahousehold Resource Allocation: Policy Issues and Research Methods, Washington, D.C.
- McElroy, M. 1990. The empirical content of Nash-bargained household behavior. *Journal of Human Resources* 25: 559-583.
- \_\_\_\_\_. 1992. The policy implications of family bargaining and marriage markets. Paper presented at the IFPRI-World Bank Conference on Intrahousehold Resource Allocation: Policy Issues and Research Methods, Washington, D.C.
- Pahl, J. 1983. The allocation of money within marriage. *Sociological Review* 32: 237-264.
- Pitt, M., M. Rosenzweig, and M. D. Hassan. 1990. Productivity, health, and inequality in the intrahousehold distribution of food in low-income countries. *American Economic Review* 80: 1139-1156.
- Poats, Susan V. 1991. *The role of gender in agricultural development*. Issues in Agriculture 3. Washington, D.C.: Consultative Group on International Agricultural Research.
- Rosenzweig, M. 1986. Program interventions, intrahousehold distribution and the welfare of individuals: modelling household behavior. *World Development* 14: 233-243.
- Samuelson, P. 1956. Social indifference curves. *Quarterly Journal of Economics* 70: 1-21.
- \_\_\_\_\_. 1963. Discussion. *American Economic Review Papers and Proceedings* 53: 231-236.

- Schultz, T. P. 1990. Testing the neoclassical model of family labor supply and fertility. *Journal of Human Resources* 25: 599-634.
- Sen, A. K. 1966. Labour allocation in a cooperative enterprise. *Review of Economic Studies* 33: 361-371.
- \_\_\_\_\_. 1985. Women, technology, and sexual divisions. *Trade and Development* 6: 195-213.
- \_\_\_\_\_. 1986. Social choice theory. In *Handbook of mathematical economics*, vol. III, ed. by K. Arrow and M. Intriligator. Amsterdam: North Holland.
- Tauchen, H., A. Witte, and S. Long. 1991. Domestic violence: A nonrandom affair. *International Economic Review* 32: 491-511.
- Thomas, D. 1990. Intrahousehold resource allocation: An inferential approach. *Journal of Human Resources* 25: 635-664.
- \_\_\_\_\_. 1992. The distribution of income and expenditure within the household. Paper presented at the IFPRI-World Bank Conference on Intrahousehold Resource Allocation: Policy Issues and Research Methods, Washington, D.C.
- Ulph, D. 1988. A general noncooperative Nash model of household consumption behavior. University of Bristol, Bristol, England. Mimeo.
- Woolley, F. 1992. New approaches to testing economic models of the household. Carleton University, Ottawa, Ontario, Canada.

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