Biological Basics and Intergenerational Transfers
Donald Cox

Description of the research

My research focuses on the relationship between intergenerational transfer behavior and two distinct but related "biological basics." The first is that, barring extraordinary events like maternity ward mishaps, a biological mother always has complete certainty that her offspring are genetically related to her. Conversely, barring extreme behavior such as sequestration of his mate or the ordering of a DNA-based paternity test, a father can never be completely certain about his relatedness to his children. The second "biological basic" is that differential gamete size between the sexes (the plentitude of cheap sperm relative to the scarcity of expensive eggs) implies that, at least in principle, a well-provisioned, ambitious man can literally "go forth and multiply," while a woman can only "go forth and add."

How might these "basics" affect intergenerational transfer behavior? Consider first paternity confidence. William D. Hamilton's kin selection model, a mainstay the biological approach to parental investment, posits that genetic relatedness is a key determinant of transfers from parents and other relatives. The incorporation of paternal uncertainty into "Hamilton's Rule" implies a possible shortfall in paternal relative to maternal solicitude.

Of course, fathers and mothers differ for reasons unrelated (or only indirectly related) to biology—most notably, Gary Becker's sexual division of labor. For this reason I back up a generation to consider grandparents, and in particular maternal versus paternal grandmothers. The former is the only one of four grandparents with complete certainty of relatedness to grandchildren. The others, including her paternal counterpart, might harbor some flicker of doubt. (Note that this "grandparental gambit" might attenuate but by no means completely finesses the problem of household division of labor; perhaps arranging for babysitting is "my wife's department," for example, and she is more inclined to call upon her own mother for assistance than mine.)

My strategy for analyzing the potential effects of paternal uncertainty is to contrast transfers to grandchildren made by maternal versus paternal grandmothers, and in particular to investigate how maternal-paternal differences in grandmotherly care vary with circumstances that might be credibly implicated with paternity confidence. Such factors might include cultural practices and traditions (for example, marriage customs, women's rights) as well as socioeconomic status. The challenge (as always!) is identification: isolating, if at all possible, the conditions under which paternity confidence might vary in ways that can credibly be argued to be orthogonal to unobservable forces impinging on child transfers. The logic of identification, in turn, hinges on questions surrounding the practices themselves: Why did they originate? Do original rationales prevail? If not, what sustains these practices?

While the first "biological basic" concerns differences between grandmothers, the second—potential differences in the reproductive prospects of males and females—concerns differences between treatment of sons and daughters. Suppose you were from the poorest household in your community, which (let's assume) has a semi-polygynous marriage market where well-provisioned husbands can take more than one wife (concurrently or serially). Suppose further that you were concerned with the perpetuation and extent of your future family line, and that you could only have a single child, and that you could somehow choose the sex of your child—would you prefer a son or a daughter? A son with little resources to offer might get closed out of the mating

sweeps, seeing how his richer counterparts tend to monopolize females. By contrast a daughter would stand a better chance of producing offspring and perhaps advancing in socioeconomic status as well. Conversely being from the richest household would tilt your preferences toward a son, who stands a chance of dominating the mating sweeps, perhaps producing several offspring by multiple wives and/or concubines.

Such is the logic of the so-called "Trivers-Willard" effect, named after biologist Robert Trivers and his collaborator Dan Willard for their work in 1973 on parental sex preferences. The Trivers-Willard effect forges a link between the treatment of sons versus daughters, parental wealth, and the nature of marriage markets. (Below, I report some preliminary results pertinent to this effect for the United States.)

Status report
Analysis of Trivers-Willard effects will eventually comprise about half of my research, but for now, the bulk of what I report below concerns the implications of the first "biological basic," paternity confidence and its potential connection to transfers and care provided by maternal versus paternal grandmothers.

My jumping off point is the simple descriptive results I reported in section C of my R01 application (Cox (2003)). In that paper, I documented simple descriptive statistics about maternal versus paternal grandmotherly care. Those simple unconditional results indicate (roughly) a 25 percent maternal "advantage" with respect to grandmotherly solicitude, across a wide variety of measures: hours of care, frequency of sleepovers, frequency of contact, and even frequency with which grandmothers reported feeling "extremely emotionally close" to grandchildren.

A natural next step is to explore commonsensical possibilities for how and why these unconditional differentials exist. Maternal grandmothers, for example, tend to be younger and healthier than paternal grandmothers. Distance from grandchildren, demographic and labor force characteristics of parents, the number and age distribution of grandchildren, and many, many more are left uncontrolled for. The first order of business in continuing to describe the data therefore was to condition on the obvious covariates thought to be implicated in provision of contact and care.

Because this is indeed description, the language that I use to describe the multivariate results will be couched in terms of partial correlations as opposed to a causal model. I simply investigate whether maternal (grandmotherly) status remains positively correlated with transfers to grandchildren once a set of ordinary, commonsensical covariates are controlled for, and the answer is "yes": conditional maternal-paternal differences are smaller but remain substantial.

My long-term aim is to investigate whether (1) by accounting for economic and other non-biological determinants of maternal-paternal differences, the null hypothesis of paternity uncertainty can be backed into an ever-shrinking corner, and (2) to explore whether maternal-paternal differences vary by cultural and institutional forces that could be construed to affect paternity confidence. (Of course, the obvious challenge is to find forces that can credibly argued to affect paternity confidence and yet be independent of grandmotherly generosity. I argue below that this formidable-looking task might actually be less daunting than it appears.)

My methods exploit parallels from a well-established and distinct but nonetheless isomorphic empirical problem—measuring labor market discrimination in male-female wage differences. Like discrimination, paternity uncertainty is unobservable and can only be inferred indirectly at

best. Like wage differences, maternal-paternal differences are affected by many other (and far more important) things. Further, the pitfalls of the approach—that some putative determinants may be endogenous, that the list of determinants may be incomplete, that the method entails index number problems—are well recognized.

With this backdrop, I proceed to report an especially intriguing recent finding from studying the National Survey of Families and Households Data. I took a sample of husbands and wives who with (1) children living at home and (2) whose mothers were alive (but not residing with them). I examined a binary variable related to grandparental child care—whether such care was received in the past year—controlling for several characteristics of parents, grandparents and children (e.g., labor force status of parents; ages of children; age, health, and distance from grandmothers).

A further covariate I added to the regression was an attitudinal variable (collected five years previous to the other information) concerning husbands' and wives' attitudes toward marriage as reported privately in separate, self-enumerated questionnaires. I was drawn to this variable in light of the unique perspective on marriage advanced in some quarters within evolutionary biology: the distinctively unromantic notion that marriage is synonymous with "mate guarding," a system by which mutually suspicious spouses monitor one another's activity with the aim of monitoring and preventing infidelity. The question had to do with whether how strongly respondents agreed or disagreed with the statement that "Marriage is a lifetime relationship and should never be ended except under extreme circumstances." The answer to this question bore a statistically significant relationship to grandmotherly care in only one instance: paternal grandmothers were significantly more likely to provide care when their daughters-in-law reported a strict (as opposed to lenient) attitude toward the permanence of marriage.

This is precisely what would be expected under the paternity uncertainty hypothesis: paternal grandmothers are the ones who are predicted to be concerned about the fidelity of their daughter-in-law.

Of course, such preliminary, descriptive correlations must be labeled with banner-sized warnings of *caveat emptor.* It is all too easy to read causal explanations into spurious correlations. For instance, my mother-in-law turns out to be a wonderful babysitter, which fuels my appreciation for the benefits of monogamy. (Though note the temporal sequence; reported attitudes predate reported care by five years.)

Continuing the spirit of *caveat emptor,* I report two additional descriptive findings. The first comes from the Fragile Families data set, a survey of single mothers and (in 75 percent of the cases) fathers as well, taken soon after the birth of the child. One question asked of both fathers and mothers in the first wave concerned the resemblance of the child to parents and other relatives. Two-thirds of the fathers reported that the child looked like them or their side of the family; the other third reported resemblance to the mother, the mother's side of the family, or something else (e.g. "looks like him (her) self"). In the second wave, conducted a year or more later, mothers were asked (in the case of non-co resident fathers) how many days during the last month the father spent with the child. I uncovered statistically significant and large differences by self-reported resemblance. (But intriguingly, only for fathers of boys.)

What we make of such a finding, at this point, would constitute pure speculation. One could make a logical case for causality in either, both, or no directions. (Just one consideration: imagine that men who are intrinsically more altruistic are inclined to see themselves in their infant sons.)

Causality notwithstanding, however, the focus on biological basics confers an advantage, even at this descriptive stage, by pointing the way toward demographic variables of interest that more standard approaches might ignore.

The potential benefits of the roadmap that biological basics provide can be illustrated in another, completely different, finding—one that concerns, as alluded to earlier, the treatment of sons versus daughters as predicted by the Trivers-Willard effect. Using the Health and Retirement Survey, I examined differences in educational attainment of the sons and daughters of a sample of parents who had (1) exactly one son and one daughter and (2) whose children were old enough to have been likely to have completed their education. I plotted the frequency with which the education of daughters exceeded that of sons and *vice versa* against the rank of parental net worth in the sample. I found a result consistent with the Trivers-Willard hypothesis: daughters tend to be "favored" over sons at net worth below the 75th percentile, where the advantage crosses over to sons.

Is this really due to Trivers-Willard, or does it emanate from something else entirely? Even one of the most biologically minded economists, Ted Bergstrom, expresses strong doubt that anything like Trivers-Willard effects are generating this result. Nonetheless, I would not have thought to undertake the estimation had I not been pondering such effects, and the results themselves, for whatever reason they occur, are somewhat surprising and interesting, and are worth exploring further. I contend that this is the primary benefit of the "biological basics" approach: whether in the end it turns out to matter for intergenerational transfers or not, it points the way toward a systematic and falsifiable means to explore and analyze demographic patterns in such transfers. It is for this reason that I believe the "biological basics" approach is likely to continue to generate interesting directions for empirical work.

Family Background and Subsequent Helping Behavior

Mark Wilhelm

The project addresses the substantive question, Is helping behavior in adulthood adversely associated with low family income and family structure change during childhood? We examine three domains of adult helping behavior: charitable giving, volunteering, and the emphasis placed on own children's helping behavior ("helping emphasis"). We model childhood family income and structure in three stages: early childhood, middle childhood, and adolescence.

Helping behavior is linked to the development of children's morality and empathy (Eisenberg and Mussen 1989, pp. 127-128). By finding whether low income and family structure change in specific stages of childhood have an association with later helping behavior, the results will provide some evidence about which stages are important in the development of prosocial moral reasoning and empathy. The development of prosocial moral reasoning and empathy is clearly important for maintaining civil society. Understanding whether low income and family structure change are associated with charitable giving and volunteering is also important because public policy attempts to strengthen civil society by encouraging charitable giving and volunteering. Finally, charitable giving and volunteering derive, at least in part, from the same prosocial and empathic development that undergirds helping family members (e.g., Antonucci and Akiyama 1987; Moore et al. 1999). Hence, results about giving and volunteering (and certainly results about helping emphasis) will shed some light on the development of the willingness to help those inside the family.

In addition to addressing the substantive question, the research makes two methodological contributions to the study of the association between childhood family structure and outcomes. First, we show that if the child development process is dynamic—meaning that

the effect of a family structure change on development depends upon what changes, if any, occurred before—then variables typically used to model family structure impose identifying restrictions on the empirical specification of the underlying child development process. Different variables used to model family structure imply different sets of identifying restrictions. Second, because there is little guidance from child development theory as to which set of identifying restrictions is most appropriate, we compare specifications against each other using non-nested specification tests for maximum likelihood models (Davidson and MacKinnon 2004 pp. 673 ff).

We estimate models of the charitable giving done by adults aged 25-33 in 2001 as a function of their family income and structure during childhood and a wide range of their current adult characteristics: sex, age, marital status, children, race, ethnicity, religious affiliation, education, work status, health, wealth, current income, and average past income. Education, wealth, current income, and past income are especially important to reduce the chances that family income during childhood proxies unobservable aspects of permanent income. We estimate the models using data from the 1968-2001 waves of the *Panel Study of Income Dynamics* (PSID) and one of its components, the 2001 *Center on Philanthropy Panel Study*. The 2003 wave of these data will be used to estimate volunteering models. The *Child Development Supplement*-II (2002 *Primary Caregiver Household File*) will be used to estimate the helping emphasis models. We estimate models of two kinds of charitable giving: religious giving (for example, to a church, synagogue, mosque, TV or radio ministry) and secular giving (everything else: United Way, poverty relief, health, education, the arts, the environment, etc.). We will do the same for volunteering.

The giving and volunteering models are censored regression models because many adults

do not make charitable donations. We handle the censoring using Tobit estimation, but check the robustness of the results using censored least absolute deviations (CLAD). The helping emphasis models will be estimated using probit and ordered probit, with robust checks using OLS.

The results we have obtained to date are from the charitable giving models and focus on family income during childhood. The results are preliminary in the sense that they come from models to which we plan to add a few more controls (mother's employment during childhood and residential moves). However, one result is strong enough, and appears robust enough, that we are comfortable talking about it at this point.

The robust result is a positive association between income during adolescence and subsequent giving to secular purposes. Elasticity estimates are around 0.5, a fairly large association. Examining several specifications of income indicates that the association is primarily due to low income: having adolescent family income below $29,000 is associated with 70 percent lower secular giving as a young adult. The adolescent income association is significant in almost all specifications of income and estimation methods—the exceptions are a spline specification of income with Tobit estimation and a quadratic specification of income with CLAD estimation; but even these exceptions produce point estimates in line with the other specifications. There is always concern that a result such as this is actually reflecting the omission of some other important influence. We have focused on permanent income, and the checks we have been able to carry out suggest that the positive association between income during adolescence and later secular giving is not due to unobservable permanent income.

The positive association between income during adolescence and subsequent secular giving lends support to the importance of the empathic orientation and internalized value stages

in the development of prosocial moral reasoning; these stages involve the ability to conceptualize helping in the abstract, take the perspective of another, and assume some social responsibility. The income-during-adolescence result makes further sense in that adolescents are cognitively ready to comprehend parental giving as a model to be adopted.

An intriguing, but less robust, result is that income during middle childhood has a counterintuitive negative association with subsequent secular giving. Moreover, in a four-stage model, it is income at ages 5-8, just as children enter elementary school, that exhibits the negative association. We are very interested to see if this association persists after we add controls for mother's employment.

We have just begun examining family structure results. We have already found that the results depend upon the particular variables used to model family structure (recall the differences in results depending on which variables are used to model family structure in Hill, Yeung, and Duncan's 2001 stage-specific analysis of family structure and years of completed schooling and out-of-wedlock births). If we model family structure with "event" variables (e.g., variables for whether there is a family structure transition at each stage) we find evidence indicating negative associations between events occurring during adolescence and subsequent secular giving. And we find evidence of a negative association between mother absence in early or middle childhood and subsequent secular giving. However, if we use "state" variables (child ever in the mother-only state during early childhood, ever in the mother–step-father state during early childhood, etc.) the adolescence evidence weakens. Given this pattern (and the fact that we have only begun estimating models with family structure variables) we remain tentative in our view of these results until we execute the non-nested specification tests discussed above.

Working Papers:

Bandy, Robert and Mark Wilhelm. 2003. "Family Income During Childhood and Subsequent Charitable Giving of Young Adults." Mimeo, IUPUI.

Wilhelm, Mark. 2004. "Restrictions Imposed by Family Structure Specifications: A Technical Note." Mimeo, IUPUI.

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Long term care and Intergenerational Resource Allocation

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Abstract:
Concerns about the potential erosion of the family as a support network have prompted a variety of public policy proposals designed to influence the dynamics of family support. A better understanding of the process by which families come to assume and share the responsibility of caring for their disabled elderly members is essential for designing and evaluating long-term care policies. Our first aim in this study is to develop a dynamic, game-theoretical model of intergenerational family decision making that accounts for interactions among family members. Using a sequential three-stage game, we examine living arrangements choices (the disabled elderly parent lives independently in the community, in a nursing home, or resides with one of her children), children's transfers of time and cash to the parent, intervivos transfers from the parent to each child, and parental use of formal care. Our framework explicitly accounts for the presence of multiple players and the role of government in providing untied (e.g., Social Security) and tied (e.g., Medicare) transfers to elderly persons and their caregivers. Our second aims is to test two key implications of the model: (i) The relative bargaining power of an adult child who coresides with her disabled parent will be reduced relative to non-coresident siblings and (ii) family living arrangement decisions will be influenced by expected transfers by all children and policy variables, including the form (in-kind versus cash), targeting (elderly persons verus caregiver), and generosity of government programs. These implications will be tested empirically by using difference-in-difference techniques (relative bargaining power hypothesis) and a simultaneous, multi-equation, endogenous switching model (expected transfer hypothesis). The empirical work will take advantage of panel data available for a nationally representative sample of elderly parents and their adult children (Assets and Health Dynamics of the Elderly/Health and Retirement Survey). Results from these analyses will provide important insights into the efficiency of intergenerational living and care arrangements and the distributional effects of alternative government long-term care policies.

Specific Aims

A number of demographic trends suggest that the demand for long term care for older persons will increase in the near future. The impending increase in the number of and proportion of older adults has renewed interest in the nature of intergenerational relations and the role of families in providing for their elderly members. Interest in intergenerational family behavior has also been heightened by concerns about the combined effect of other demographic trends, including changing fertility patterns and family structure. Substantial declines in fertility, coupled with high levels of divorce and remarriage, threaten families' willingness and ability to continue playing the dominant role in elder care. At the same time, trends toward delayed childbearing and increased female labor force participation suggest a growing generation of adult children, especially women, who are caught between the demands of childrearing and elder care, while playing a demanding role in the work force.

Concerns about the potential erosion of the family as a support network have prompted a variety of public policy proposals designed to influence the dynamics of family support (1993 Family and Medical Leave Act;1997 Balanced Budget Agreement; 1999 Bipartisan Commission on "Saving Medicare"). Public debate has also begun to focus on the economic burden of family

caregiving and on the potentially deleterious social effects of increased competing demands among potential caregivers (AARP 1998). A better understanding of the process by which families come to assume the responsibility and share the burden of caring for the disabled elderly is essential for designing and evaluating long-term care policies.

Family long-term care is often the resultant of numerous individual and joint decisions by family members with different preferences facing different constraints. Family members, most notably, adult children, not only make caregiving decisions on behalf of disabled family members but often provide hands-on care themselves and share the financial consequences of caregiving decisions. Moreover, the preferences of the disabled elderly may differ from those of their adult children. Differences may arise about the type of care the disabled elderly receive and the setting in which they receive it; for example, a child may want a parent to receive care from a family member, but prefer that some other child provide the care. Uncertainty about the parent's future health and potential informational asymmetries among family members further complicate the modeling of family caregiving decisions. The possibility of conflict regarding the optimal care path and the role of different family members in achieving it suggest that family members may have incentives to behave strategically. One of our goals is to develop a game-theoretic model of family caregiving that accounts for these complexities. Such a model will provide a framework for analyzing the design and targeting of policy initiatives aimed at addressing the long-term care needs of the growing U.S. elderly population.

Our specific aims are:

1. *To develop a dynamic, game-theoretical model of family decision making that accounts for interactions among family members.* Living arrangements —the disabled elderly parent lives independently in the community, in a nursing home, or resides with one of her children— transfers of time and cash from each child in the parent's family network, intervivos transfers from parents to children, and parental use of formal (paid) care are examined using a three-stage game. Specifically, our framework (i) accounts for the presence of multiple adult children and allow for strategic interactions among siblings, which are hypothesized to affect the disabled parent's optimal care path and (ii) includes a formal model of government tied and untied transfers, which are hypothesized to affect differentially transfers from adult children.

2. *To use the three-stage model to investigate the effects of alternative government long-term care policies on living arrangements and transfers, and to assess the efficiency of intergenerational living and care arrangements.* Two key implications of the model will be tested: (i) The relative bargaining power of an adult child who coresides with her disabled parent will be reduced. As a consequence, siblings of the coresiding child will provide lower levels of transfers to the parent after a joint household is formed, after controlling for the variables that capture the long term care needs of the parent; (ii) Family living arrangement decisions will be influenced by expected transfers by all children and policy variables, including the form (in-kind versus cash), targetting (elderly persons verus caregiver), and generosity of government programs. We hypothesize that persons with needs for in-home assistance (ADL/IADL needs) or community-based services (e.g. special transportation, special equipment) who live in state environments that are rich in home and community-based resources (e.g. more LTC program options, more generous eligibility/services) will be less likely to reside with a child and less likely to enter a nursing home. Moreover, such programs are hypothesized to reduce informal care assistance provided by all children.

Progress To Date:
Long Term Care and Family Decision Making. In this theoretical paper, we propose a two-stage bargaining model to analyze the living arrangement of a disabled elderly parent and assistance provided to the parent by each of her adult children. The first stage determines the living arrangement: the parent can live in a nursing home, live alone in the community, or live with any child who has invited coresidence. The second stage determines the assistance provided by each child in the family. Working by backward induction, we first calculate the level of assistance that each child would provide to the parent in each possible living arrangement. Then, using these calculations, we analyze the living arrangement that would emerge from the first stage game. A key assumption of our model is that binding agreements cannot be made at the first stage regarding assistance to be provided at the second. Because, in the absence of binding commitments, coresidence affects the bargaining power of a coresident child relative to her siblings and the parent, the equilibrium of the two-stage game need not be Pareto efficient.

Bargaining Power and Intergenerational Coresidence: Adult Children and Their Elderly Parents. The purpose of this first empirical paper is to examine the effect of changes in intergenerational coresidence on intra- and interhousehold time transfers by adult children to their disabled elderly parents. Our framework, which draws on the theoretical paper discussed above, suggests that living and care arrangement decisions of adult children take place in an environment in which considerations of the responses of their siblings to their own decisions matter, and may adversely affect a child's willingness to coreside with her disabled elderly parent. In testing the hypothesis that the relative bargaining power of adult siblings changes with changes in their coresidence status with the parent, we rely on difference-in-difference estimator applied to data from waves 1 and 3 of AHEAD. In particular, we examine the extent to which children's differences in time transfers across survey waves can be accounted for by changes in their siblings' coresidence status with the parent. Overall, the results of the preliminary analyses are consistent with the hypothesis that non-coresident children take advantage of their superior bargaining power by reducing their contributions to parental care. In particular, our results indicate that:

--Children whose sibling moved out of the parental household between 1993 and 1998 are significantly more likely to provide parental care in wave 3. They also provide more hours of care in wave 3 relative to wave 1. These effects persisted despite controls for changes in parent's health and disability and other factors likely to influence the decision of providing care.

--Children whose sibling make a transition into coresiding with the parent are less likely to provide care themselves and provide fewer hours of care after than they did before parent - sibling coresidence.

Publications or presentations:
Preliminary versions of two manuscripts related to the grant have been completed and presented at several academic and professional meetings, including the 2003 European Society for Population Economics, New York; the HRS-sponsored Conference on Older Families, Santa Fe, NM, and seminars at Washington University, University of Michigan, University of Kansas, University of Victoria, University of British Columbia, University of Virginia and RAND .

Give and take: Child agency in resource allocation

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Abstract

A top-down model of policy and intra-family allocation of resources to children predicts a one-way flow of influence: policies influence parents who in turn influence their children. A transactional vision of the process includes feedback between these levels. Parent-citizens affect their children, but they also shape policy effects through interfacing with systems. Just as parents are not passive recipients of "policy," children do not simply receive "parenting." From pitching in with chores to pitching fits, children contribute to and actively claim resources within households. The overall goal of the proposed research is to examine the child's role in shaping intra-family resource allocation, with a particular emphasis on implications for policy-relevant research and possible points of intervention.

This project consists of three specific aims to be achieved through a series of secondary analyses using both qualitative and quantitative data. The first aim of this project is to describe the mechanisms whereby children, particularly young adolescents, affect resource allocation within households. How do an individual child's actions or characteristics affect the share of family resources that she or he receives? How do children's actions affect the total amount of resources available to a family?

Second, analyses will examine how children's contributions and claims impact well-being for and within families. What is the effect of children's actions on the overall level of well-being within a family? Does contributing to the household help or harm the development of young adolescents? When older siblings' contributions to the household include caring for siblings, what is the impact on these

younger children? Finally, an explicit aim of this research is to refine current conceptual models in light of findings about children's contributions to intra-household resource allocation. What model of resource allocation within families best captures child agency? What are the implications of this model for how policy-relevant social science research and policy analysis are conducted?

Update

Work to date has focused on the first aim, concerning the determinants of children's resource allocation, and the third aim, concerning the development of a model for resource allocation. Two papers have been prepared and presented.

1. "How much allowance do young adolescents get and do they seem to work for it?" Presented in session on "Family Economics" Western Economic Association Meeting, Vancouver, BC, July 2, 2004.

2. "Maternal labor supply and child decision power: Evidence on the adultification hypothesis" Presented in session on "Bargaining in Families" American Economic Association, Philadelphia, PA. January 8, 2005.

Both of these papers are based on survey data (Add Health, NLSY) and the key outcomes are allowance receipt and decision-making within households. We are also working with qualitative data collected from an ethnography of low-income working families. This has lead to some initial classifications of children's total resource patterns within the household. Some children are givers, some are takers, some are transactors. I will present some of these initial patterns at the March meeting.

Here are some observations on the work to date. One persistent challenge is how to think about the relationship between observed behavior patterns and motives. Children may do housework, exercise decision power and receive resources for different reasons. Parents may require work and grant limited

decision making rights and resources because they view these activities as leading to their children's development. Or parents may need work and grant rights in return. Alternatively children may actively claim rights and resources due to their relative power, power that is perhaps based on their work being needed. A difficult we face is parceling out these competing explanations in light of identical observed behavior (or even figuring whether parceling out is the right way of thinking about this).

One way to frame this challenge is in terms of defining the actors. In rejecting portrayals of children as either fully-adult and or fully-dependent, models become much more complex. In commenting on our paper at the AEA meetings, Ted Bergstrom noted that biologists consider economists to be strange scientists in that they only study the behavior of adults of the species. These types of considerations are guiding our work on parent-child bargaining models.

Family Culture and Intergenerational Allocations
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Research Description

Intergenerational transfers occur within a family context, but most research on the topic focuses on the attributes and behaviors of individuals in the family matrix and not on family environment itself. While family characteristics, such as size or composition, are often examined, they are seldom conceptualized in the broader context of a family culture or family environment that defines each family's variant on the norms of kinship. Yet, aspects of family culture may define notions of obligation, expectation, and responsibility that distinguish the transfer behaviors of one family from another and define the environment within which individuals act. Layering notions of shared family traits onto more conventional measures of individual kin is likely to yield new sociological insight into why similarly-configured families differ in their kin exchange behaviors or why individual characteristics have variable effects across families. Moreover, the concept of family transfer cultures offers the promise of unifying research on assistance to older and younger generations, research that heretofore has involved disparate frameworks.

The **first** goal of our proposed research is to understand how families *qua* families differ in their transfer behavior to ascending and descending generations. We utilize multi-level modeling to describe between-family differences, focusing on the following research questions:

Goal I. Understanding shared family attributes

1.1 To what extent do families differ in their collective orientation to intrafamily transfers?

1.2 What measured aspects of family transfer culture distinguish among families in terms of the type, direction, or intensity of transfers?

1.3 Does understanding how the culture of a family modifies intergenerational transfer behaviors supplant or augment existing notions of transfer behaviors based only on individual attributes of donor and recipient? For example, are the transfer behaviors of middle-aged women toward their own parents and own children more consistent with their family of origin's ethos of inter-vivos giving than the behavior of their age peers?

1.4 What attributes of adult children (e.g., level of education, age, or features of spouse's family) encourage or discourage behaviors consistent with the transfer culture of one's own family of orientation?

The concept of family culture has implications for studying within-family differences as well. Each marital partner experiences a distinct family culture in his or her family of origin. One spouse, for example, may have lived with an elderly grandmother or received financial help from relatives while growing up while the other has not. Such disparate experiences may affect transfers from one partner and his/her siblings to *their own* elderly parents or from one partner to the *other partner's* parents. We call the distinct family cultures of each spouse's family of origin "family subcultures" and the corresponding family units "subfamilies." Family subcultures also may affect transfers to children. In allocating

resources to their children, the two partners forge a new, blended family culture, but allocations to stepchildren may be more affected by the family subculture of that child's biological parent. Our **second** goal is to understand the within-family differences created by a blending of different family subcultures. We propose to examine the following within-family issues:

Goal II: Understanding within-family processes

2.1 To what extent do spouses' family subcultures differ in their collective orientation to intrafamily transfers and what measured aspects of family subculture distinguish among subfamily behavior in helping their own elderly parents?

2.2 Do measured aspects of subfamily culture contribute to understanding cross-parent provision of help (i.e., one spouse helping the other spouse's parents)?

   2.3 Is the allocation of human capital investments by a couple to their children more similar to that of the male or female partner's family of origin?

   2.4 In parental allocations, are stepchildren treated differently from the biological children of both partners? What family attributes or stepchild attributes are associated with different treatment?

Our **third** goal is to extend the time perspective on transfer behaviors to capture not mere differences across family members, but also *changes* in within-family attributes, such as the widowhood of the elderly mother, divorce of daughter/sister, or job loss of a child/sib. Previously, fixed-effects models have been used to address a broad range of donor or recipient selection issues, such as which adult sibling will provide care or which will benefit from a substantial human capital investment from their parents. But a fixed-effects model holds constant the unique family context in which choices are made. There are, however, advantages to recognizing change explicitly. While some family attributes are stable over long periods of time, such as ethnicity or early life "demonstrations" of kin obligation and responsibility, others change slowly as life-cycle transitions accumulate – for example, migrants' exposure to U.S. culture. By capturing the dynamics of change for multiple family members over multiple waves of observation, we gain analytic leverage. Our third goal exploits the panel nature of our data to explore life–cycle dynamics of family attributes and transfer behaviors, such as:

Goal III. Understanding dynamics of family culture and transfers

   3.1 What is the relationship between transfer behavior and family change (i.e., a change that modifies attributes shared by all members of the family, such as the elderly mother becoming widowed or ill)? For example, does illness or widowhood of an older relative reduce the probability of helping an adult child? How is help to older and younger generations sequenced as the characteristics of each generation change?

   3.2 To what extent does the relationship between transfer behavior and within-family change depend on the family culture of obligation and caring?

   3.3 Do Mexican immigrants reconstitute their family transfer culture in the U.S., and are transfer behaviors responsive to the same attributes of potential donors and recipients in Mexico and the U.S.?

Our **fourth** goal concerns macro-changes in American society that have cross-cut all age groups. Among those of note for studies of families and transfers are lower fertility, leading to fewer horizontal extensions in the family of origin, increases in the odds of divorce and remarriage, leading to increasing diversity in families and family households, and related increases in the prevalence of blended families, often including both own and step-children. Gains in generational length of life yield more vertical extensions of the family of procreation, and possibly increases in the number of person-years lived with both surviving parents and own children. Collectively, such changes may attenuate notions of filial responsibility while increasing the number of potential donors and recipients on both sides of a family in ascending and descending generations. Cohort comparisons can provide insight into the meaning of demographic change for the family and intergenerational transfer behaviors:

Goal IV. How do families of different cohorts, as represented in the HRS, vary in their structure and transfer culture?

      4.1 When comparing cohorts at the same age, are there cohort differences in the probability or amount of transfers? Do these differences persist after adjusting for cohort differences in demographic and other individual attributes or family attributes?

      4.2 Are families becoming more or less similar to each other across successive cohorts? Do the cohort differences in the level of between-family variability persist after adjusting for cohort differences in demographic and other individual attributes or family attributes?

These research goals are feasible because of two recent developments. *First*, appropriate data are now available from the maturing Health and Retirement Study (HRS), a panel study of health, wealth, and family dynamics. Over the course of the proposed project, data spanning 14 years (biennial waves from 1992 to 2006) will be available for the original HRS cohort and spanning 13 years for the original AHEAD cohort. Each new wave adds richness to dynamic measures of transfer behaviors across multiple generations of a family and the changing pool of donors and recipients within a family. These data both allow analysis of family effects and provide opportunities for cohort comparisons as the HRS accumulates data on different cohorts observed at the same ages, approximately six years apart. HRS includes an oversample of African Americans and Hispanics that allows us to examine the above research questions across racial and ethnic groups. Our ability to examine ethnic differences is further enhanced by the availability of the Soldo's Mexican Health and Aging Study (MHAS). MHAS is parallel in design and content to the HRS; data on family structure, attributes of individual kin, and transfer behaviors are identical. *Second*, multilevel models are now developed to a point where they can accommodate multiple analytic levels, allow for categorical outcomes, and partition shared variance into unobserved constructs. The proposed research focuses on between-family differences in transfers as well as within-family differences. In the language of multi-level models, we seek to isolate between-family variance from within-family variance.

This research develops an inductive platform for examining intergenerational exchanges. By explicitly recognizing the multiple levels of family culture, shared family attributes, and individual kin behaviors, we attempt to re-establish the sociological notion of the family in research on both upward and downward intergenerational transfers involving multiple generations.

Status Report

Data from the AHEAD cohort for 1993-2000 and HRS cohorts from 1996-2000 have been edited. We are now working on editing of the 1992, 1994, and 2002 HRS data. Analysis to date has focused on goal one using the AHEAD cohort. The first paper from the project "Family Intergenerational Transfers to Provide Long-Term Care: Why Do Families Differ from Each Other" will be presented at the Population Association of America meetings in March, 2005. In this paper we incorporate two measures of family culture: whether the respondent's family received help from relatives and whether she lived with a grandparent while growing up. We find that the respondent's having received help from relatives in the past consistently affects the likelihood that she will receive ADL or IADL help from her children.

The linked respondent, children, and parents/parents-in law files from MHAS 2001 and 2003 also have been edited. The first paper from this nationally representative study of Mexicans aged 50 and over also will be presented at the 2005 PAA. This paper, "Dynamics of Residential Arrangements of Older Women in Mexico", by Soldo and Rania Tfaily, focuses on shared living arrangements, incorporating proximity as a dimension of the outcome. As in the Henretta-Soldo paper, this paper demonstrates the enduring effects of family culture, measured by whether the respondent lived with a grandparent as a child.

Intergenerational Support Structures and Pathways:
Division of Parent Care Responsibilities between Spouses

Maximiliane E. Szinovacz   Principal Investigator
Adam Davey   Co-Investigator

Abstract
With the aging of the population, the number of individuals requiring care is expected to increase dramatically during the next decades. Elder care puts considerable burden and strain on the caregiver. Many family caregivers thus require support by others, often other family members. Indeed, data from a recent national survey indicate that 73% of all family caregivers received assistance from other family members, suggesting that care is best understood as family system effort. Although past research provides a glimpse at the composition of family care systems, the coordination and shifting of responsibilities among family members and of changes in their involvement (e.g., care hours) remain poorly understood. One premise of our project is that the viability of family care systems is contingent on their flexibility, that is, their ability to restructure in response to the ever-changing needs and demands of caregivers and care recipients. A second premise is that caregiving must be understood as a career, of variable duration, with distinct transition points, and that the predictors of caregiver involvement at early stages may therefore differ from those of caregiver involvement at later stages of a relative's illness. Both the flexibility of care systems and changes in caregiver involvement over time are further expected to have consequences for caregivers, care recipients, and use of formal services or nursing home placement. The main aim of this project is to assess changes in family care systems over time, to examine the predictors of such changes both at the level of the caregiver and of the care system as a whole, and to investigate the impact of such changes on selected outcomes, including well-being of the caregivers and care recipients, the extent of unmet care needs, the use of formal services, and nursing home placement. Our analyses will rely on data from the Health and Retirement and Assets and Health Dynamics of the Oldest Old surveys and rely on statistical methods that are appropriate for multi-level data with endogenous and censored variables from complex surveys. Our results can inform policies and programs designed to enhance the care systems of frail and cognitively impaired elders as well as policies and programs targeting the well being of families and caregivers. They also speak to the future availability of family caregivers in response to changing family structures and caregiving requirements.

Aims
Elder care puts considerable strain on the caregiver. Many family caregivers thus require support by others, often other family members. Indeed, data from a recent national survey indicate that 73% of all family caregivers received assistance from other family members, suggesting that care is best understood as a family system effort. Although past research provides a glimpse at the composition of family care systems, the coordination and shifting of responsibilities among members of family care systems remain poorly understood. The main goal of this project is to assess changes in family support systems (including changes in individual caregiver careers) over time, using longitudinal data from the Health and Retirement HRS) and Asset and Health Dynamics of the Oldest Old (AHEAD) Surveys.

Theoretically, our approach integrates assumptions from the life course and family systems perspectives with hypotheses derived from prevailing theories on intergenerational supports. We argue that variability in family support systems over time reflects changes in the life course experiences and characteristics of all involved family members (i.e., both caregivers and care recipients), and that changes in the life course experience of one family member can permeate the entire support system. The specific research aims guiding this project are as follows.

- Identify and describe specific types of family care systems over time. We will first assess changes in specific care dimensions (extension, composition, extent of contributions, and type of contributions) and then more complex patterns of changes across several dimensions.

- Identify predictors of changes in family care systems and of caregiver career trajectories. We will first assess changes in individual care dimensions and then changes in more complex care patterns. Our theoretical focus is on predictors relating to changes in caregivers' and care recipients' life course experiences outside caregiving and to predictors relating to their caregiving experiences themselves.

- Examine selected outcomes of changes in family care systems and in the overall stability of the care system. Due to data limitations, these analyses will be restricted to outcomes for respondents to either survey. For caregivers, we will assess the effect of changes in family care systems on well-being and resources. For care recipients, we will investigate the impact of changes in family care systems on well-being, use of formal services, nursing home placement, and unmet care needs.

- Compare results derived from analyses addressing caregiving for parents (caregiver's perspective) with results derived from analyses addressing care receipt from adult children (care recipient's perspective). We will conduct special analyses (e.g., analyses using only variables available for both perspectives) that allow direct comparison of findings from each perspective. These results can then be compared to the full models to estimate whether omission of specific variables in each data set bias results.

Progress to Date
As expected much of the previous grant period was devoted to programming efforts of the very complex family files in the HRS data sets. In this grant period, we had to update some of the files as HRS released new data versions (e.g., for parents in wave 2), but were also able to begin analyses of the data. Programming of the new parent files from all the HRS for waves 1-5 is nearly completed, as is programming of the sibling and children files for the same waves. In programming these files, we not only adjust them to the appropriate analysis level (e.g., parent level for each individual parent) but also correct the many inconsistencies across waves, impute missing values, and combine diverse files (e.g., parents and sibling files) to achieve files that are necessary to achieve our aim of comparing support networks over time.

To date we have completed analyses for five presentations (two at the Gerontological Society of America, one at the Austrian Institute for Family Research, one submitted to the American Sociological Association, and one for presentation at the Geriatric Grand Rounds of Eastern Virginia Medical School).

Presentations Resulting from Grant to Date
Szinovacz, M. E., & Davey, A. (2005, August). *Division of parent care between spouses: Variations by kin relationship.* American Sociological Association. (Paper submitted)

Davey, A., & Szinovacz, M. E. (2005, March). *Division of care among adult children.* Eastern Virginia Medical School Grand Rounds, Norfolk, VA.

Szinovacz, M. E., & Davey, A. (2004, December). *Teilung der Alternbetreuung zwischen Ehepartnern [Couples' division of parent care.]* Österreiches Institut für Familienforschung, Vienna, Austria.

Davey, A., & Szinovacz, M. E. (2004, November). *Filial norms for sharing care to parents and parents-in-law.* Gerontological Society of America, Washington, DC.

Szinovacz, M. E., & Davey, A. (2004, November). *Household help to older parents: Division of labor between adult-child spouses.* Gerontological Society of America, Washington, DC.

Effects of Child Health on Family Resources
NICHD Grant #R01-HD45630

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SPECIFIC AIMS

A growing body of research indicates that low socioeconomic status in early childhood sets the stage for increasing disadvantages in both health and educational capital over the child's life course and can cause low socioeconomic status to persist for generations. Much less is known about how child health *affects* socioeconomic status. Having a seriously unhealthy child may result in substantial financial and emotional burdens to parents, particularly those with limited financial resources to begin with, and it may reduce their capacity to invest in their child's health.

We use data from the Fragile Families and Child Wellbeing survey, a national birth cohort study of 5,000 sets of new (mostly unwed) parents with children born between 1998 and 2000, to estimate the effects of poor infant and child health on a broad array of family resources. Interviews were conducted with both parents directly following the birth, and again one and three years later. Detailed information from the hospital medical records of the mother respondents and their newborns are linked to the longitudinal survey data.

AIM 1: Estimate the effects of child health on family structure and household composition.

We are estimating models predicting parental relationships, household composition, and subsequent fertility as a function of child health. The child health measures include very low birth weight, severe health conditions, and serious developmental delays.

AIM 2: Estimate the effects of child health on parents' labor supply, other sources of financial support, child care arrangements, education, use of pediatric care and preschool services.

We are estimating the effects of having an unhealthy child on the parents' employment, child care arrangements, subsequent education, receipt of public assistance, child support, use of pediatric health care, and the child's participation in preschool programs for high-risk children.

AIM 3: Describe the overall resource and health outcome differentials at age 5 between children born in poor health and those born in good health.

We will synthesize our results by comparing resources available to children with and without serious health problems. We also will compare health outcomes of children at age 5 by both their health status in infancy and their family resources during their first 5 years.

PROGRESS TO DATE

So far, we have evaluated the effects of poor child health on parents' relationship status, labor supply, and sources of public support 12-18 months after the child's birth. We have found that having a child with poor health (defined as very low birth weight or serious disability) decreases the probability parents live together (are married or cohabiting) by 9–10 percentage points, reduces mother's hours worked by over 5 per week when mother is employed, and reduces the probability the father is employed by 8 percentage points. It increases the probability that the mother relies on TANF by 5 percentage points and the probability that she relies on any cash assistance (TANF or SSI) by 16 percentage points. Poor child health also increases the likelihood that families rely on Medicaid and housing assistance, but does not appear to affect reliance on food stamps or WIC. It is becoming very clear that poor child health has deleterious effects on a number of different types of family resources—particularly among "fragile families" (unmarried parents and their children). This may have negative effects on the children's health and economic trajectories.

We have also expanded the scope of the research by investigating maternal use of illicit drugs during pregnancy. We have found that: the demand for illicit drugs among pregnant women is quite responsive to drug prices that participation elasiticities among pregnant women giving birth are higher than those of the general population, and that prenatal drug use is strongly associated with birth weight but the association does not appear to be causal. They also suggest that self-reported prenatal drug use should be used with caution.

CONTRIBUTION

This project is providing rich and up-to-date information on the burdens faced by disenfranchised families with unhealthy children, the resources upon which they draw, and their labor market participation and family formation behaviors in the post welfare reform era. The results have already yielded, and will continue to yield, important information about the role of early child health in the intergenerational transmission of poverty and will be of practical value to policymakers, program administrators, and practitioners interested in better serving low income families. The project is also the first to provide estimates of the price responsiveness of prenatal illicit drug use, and thus provides important information about the potential for public policy to reduce this behavior by influencing drug prices (through enforcement or other means). Finally, it is one of the first in the social science literature to explore the determinants and consequences of prenatal illicit drug use.

PUBLICATIONS AND PRESENTATIONS

The following forthcoming and recently published papers have been funded in part or entirely from this grant:

Noonan, K., Reichman, N., Corman H. (forthcoming). New Fathers' Labor Supply: Does Child Health Matter? *Social Science Quarterly*.

Corman, H., Noonan K., Reichman N., and Dave, D. (forthcoming). Demand for Illicit Drugs Among Pregnant Women. *Advances in Health Economics*. Elsevier/North Holland Press.

Corman, H., Noonan, K., Reichman, N. (forthcoming). Mothers' Labor Supply in Fragile Families: The Role of Child Health. *Eastern Economic Journal*.

Reichman, N. 2005. Low Birth Weight and School Readiness. *The Future of Children* 15(1): 91-116.

Reichman, N.E., Corman, H., Noonan, K. 2004. Effects of Child Health on Parents' Relationship Status. *Demography* 41(3): 569-584.

The following presentations are/were made possible with funding from this grant:

Noonan, K., Reichman, N., Corman, H., Dave D. "Prenatal Drug Use and the Production of Infant Health." Accepted for presentation at the annual meeting of the Population Association of America, Philadelphia, PA, March 31 - April 2, 2005.

Noonan, K., Reichman, N., Corman, H., Dave D. "Prenatal Drug Use and the Production of Infant Health." Accepted for presentation at the annual meeting of the Eastern Economic Association, NY, NY, March 4 - April 6, 2005.

Reichman, N., Corman, H. Noonan, K. "Effects of Poor Child Health on Sources of Public Support." Presented at the annual meeting of the American Economic Association, Philadelphia, PA, January 7-9, 2005.

Corman, H., Noonan, K., Reichman, N., Dave, D. "Demand for Illicit Drugs Among Pregnant Women." Presented at "Economics of Substance Use—Individual Behavior, Social Interactions, Markets, and Politics" symposium in Lund, Sweden, August 13-14, 2004.

Corman, H., Noonan, K., Reichman, N. "Mothers' Labor Supply in Fragile Families: The Role of Child Health" Presented at the annual meeting of the Eastern Economics Association, February 19-21, 2004.

Reichman, N., Corman, H., Noonan, K. "Effects of Child Health on Sources and Extent of Public Support." Presented at the International Atlantic Economics Association meeting, March 2004; National Poverty Center workshop at the University of Michigan, July 2004; and annual Southern Economics Association meeting, November 2004.

Noonan, K., Reichman, N., Corman, H. "New Fathers' Labor Supply: Does Child Health Matter?" Presented at the annual Southern Economic Association meeting, November 2003.

Reichman, N., Corman, H., Noonan, K. "Effects of Child Health on Parents' Relationship Status." Presented at the Spring Meeting of the Health Economics Group of the National Bureau of Economic Research, Cambridge, MA, March 14, 2003.

National Transfer Accounts:
Aging, intergenerational equity, economic growth, and public policy

Ronald Lee and Andrew Mason, Co-Principal Investigators

Objectives
1) Develop a new system for measuring aggregate intergenerational transfers;
2) Construct historical estimates and projections of intergenerational transfers in varying social, economic, and policy contexts;
3) Analyze the inter-relationships between public policy, familial support systems, and economic conditions;
4) Analyze the effects of public policy on generational equity and economic growth.

Importance. The new National Transfer Account system will represent a significant advance because it measures both familial and public transfers, and because of its historical and international scope. These new data will be used to study the implications of population aging for both familial and public transfers, how changes in familial support systems are influencing the economic circumstances of different generations, the interaction between public and familial transfer systems, and the macroeconomic and generational effects of changes in public policy with regard to pensions, health care, and education.

Organization. Lead institutions are the East-West Center and Center for the Economics and Demography of Aging, University of California at Berkeley. Collaborating institutions are the Nihon University Population Research Institute; the Statistics Bureau of Japan; Acadmia Sinica (Taipei); Lembaga Demografi, University of Indonesia; and the Economic Commission for Latin America and the Caribbean (ECLAC); Environnement, Sante, et Societe (ENSANS). Country teams consist of senior scholars and graduate students.

Sites. Indonesia, Taiwan, Japan, United States, Chile, Brazil, and France.

Key Personnel:
Ronald Lee, University of California at Berkeley, UCB PI
Andrew Mason, East-West Center, EWC PI
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Description of Research:

In all societies intergenerational transfers are large and have an enormous influence on inequality and growth. The development of each generation of youth depends on the resources that productive members of society devote to their health, education, and sustenance. The well-being of the elderly depends on social programs that provide health care and income support and also on familial systems that dominate in many developing countries.

Figure 1. Consumption and Labor Income, Taiwan, 1998, nominal values (billions of NT$)
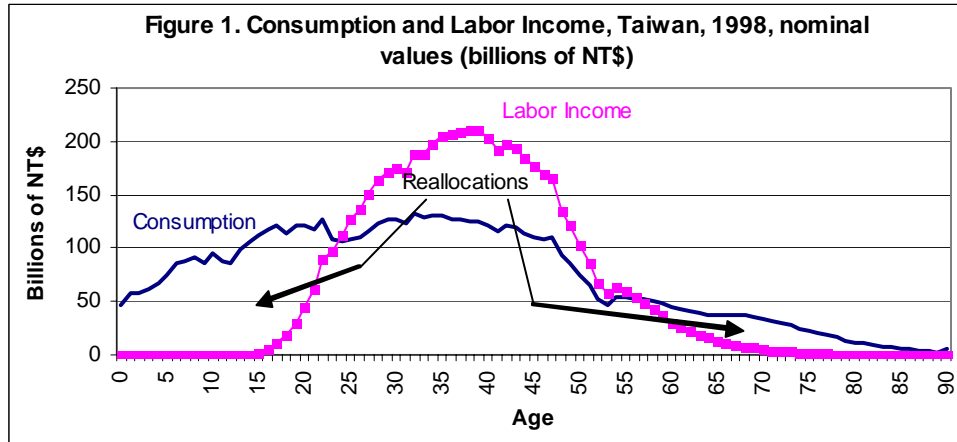
The magnitudes of the resources involved in reallocations are enormous. According to preliminary estimates, 36% of total labor income was shifted from workers to children and 11% of total labor income was shifted from workers to the elderly in Taiwan in 1998 (Figure 1).

The purpose of this project is to develop and to apply an accounting system for measuring intergenerational transfers and other age reallocation systems at the aggregate level in a manner consistent with National Income and Product Accounts. National Transfer Accounts (NTA) will provide comprehensive estimates of economic flows

Table 1. A Classification of NTA Reallocations.			
	Asset Reallocations		
	Capital Reallocations	**Property and Credit Reallocations**	**Transfers**
Public	Public infrastructure	Public debt Student loan programs Money	Public education Public health care Unfunded pension plans
Private	Housing Consumer durables Factories Farms Inventories	Consumer credit Insurance Rental of land	Familial support of children and parents Bequests Charitable contributions
Source: Adapted from Lee 1994.			

across age groups that arise primarily because children and the elderly consume more than they produce. The NTA accounts distinguish three important economic forms of these flows: the accumulation of capital, credit and land transactions, and transfers. The accounts distinguish the

institutions that mediate the transactions: the public sector and the private sector, dominated by familial transfers (Table 1).

When complete the NTA accounts will provide estimates with sufficient historical depth to study the evolution of intergenerational transfer systems; the consequences of alternative approaches to age reallocations embodied in public policy with respect to pensions, health care, education and social institutions, e.g., the extended family; and the social, political, and economic implications of population aging.

Status Report. Project funding is pending, but preliminary work has proceeded. Two meetings of the project team have been held to discuss methodological issues and preliminary research focused primarily on Taiwan and the United States. Preliminary and partial estimates for Taiwan 1998 and the US 2000 will be reported at the Annual Meeting of the Population Association of America and the IUSSP International Population Conference. A website and database system are under development. Members of the research team will use the website to upload and download statistical data that comprise the accounts, associated documentation, working papers, etc. The website will also be made available to users at an appropriate time.

Funding. Parallel proposals have been submitted to the National Institute of Aging by the East-West Center and UC-Berkeley. Funding is pending.

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Tied Transfers
Project Description for NIH Grant Number 5R01AG024048-02
NATIONAL INSTITUTE ON AGING (NIA)
John Karl Scholz (PI), Meta Brown, Maurizio Mazzocco, and Ananth Seshadri, co-PIs

Abstract of the project
While a great deal has been written about cash transfers from parents to children, little empirical or analytic work examines financial transfers that are tied to post-secondary education. In two related essays, we investigate parents' motives for tying transfers to children's human capital investment and the empirical significance of transfers tied to post-secondary education in the U.S.

In "Tied Transfers" we propose a simple model that is able to pin down the timing, magnitude and form of parent-child transfers. Unambiguous predictions arise in the presence of non-cooperative behavior and earnings risk. An imposed limitation in the ability to insure earnings gives rise to an endogenous restriction on the child's access to credit. Our model makes two key predictions. First, tied transfers diminish subsequent cash transfers. Second, a parent's educational expenditures, as a fraction of total family investment in the child's education, increase with parental wealth and altruism. The intuition underlying this prediction is that wealthier and more altruistic parents have a greater economic incentive to curtail strategic behavior on the part of their children and do so by tying more of their transfer dollars to education.

We find support for these predictions in recent data from the Health and Retirement Study (HRS) and the Wisconsin Longitudinal Study (WLS) on parents' gifts of cash and college tuition, wealth and reported economic altruism toward their children. In order for parents to value tied transfers for reasons other than obligation or taste, transfers must increase children's future resources. Our theory predicts that this, in turn, diminishes parents' future transfer liabilities. Data from the WLS allow us to determine the history of cash and educational transfers from WLS respondents to their children between 1975 and 1992, when respondents were aged roughly 36 to 53. We find that, within families, WLS parents give $0.36 less in post-schooling cash transfers for each $1 expended on a child's education, suggesting that tied transfers do in fact decrease parents' transfer liabilities.

The 1998 and 2000 waves of the HRS each elicit a rough measure of the proportion of the total costs of post-secondary education that sample parents paid for each of their children. Valid responses are available for nearly all parent-child pairs in which parents report that their children attended college. In addition, the 2001 Human Capital Mail Survey, which was administered to a subset of HRS respondents, collected a measure of the percentage of each child's tuition responding parents paid. Finally, 1996 and 2000 HRS modules on respondents' concern for the financial well-being of friends, relatives and strangers provide us with a measure of parents' willingness to give to their children should their children experience financial hardship. We find that parents who are wealthier, more economically altruistic, and otherwise more susceptible to future transfer liabilities pay for greater shares of their children's education, controlling for observable components of the total educational investment. While financial aid standards in the U.S. provide an alternative explanation for the relationship between parental wealth and the share of tuition a parent pays, no financial aid formula includes parents' responsiveness to children's financial need. It is this responsiveness that generates the child's opportunity for strategic behavior, and therefore the measured association between parents' responsiveness to children's financial need and the extent to which parents exploit the opportunity to tie transfers provides support for the strategic model.

Our theoretical analysis implies that strategic incentives distort family investment decisions away from the efficient path. Parents invest more in their children's education where families interact non-cooperatively than where they achieve the efficient frontier, and the extent of the distortion increases with parents' wealth and altruism. As evidence builds on the extent to which students from wealthy families

are over-represented at Ivy League and flagship state universities, our research offers a new perspective on more and less wealthy parents' differing incentives to educate their children.

In "Tied Transfers and Children's Outcomes" we examine the degree to which child outcomes are related to tied, educational transfers made by parents. Our work is motivated by two considerations. First, tied transfers are a large portion of the overall transfers that parents make to their adult children, yet few papers examine the phenomenon. Second, the most well-cited test of the altruistic model – the derivative test in Altonji, Hayashi and Kotlikoff, (JPE, 1997) – assumes that there is no relationship between parental altruism and child income. We show using Monte Carlo simulations that a positive correlation between children's incomes and parents' generosity will bias previous empirical tests of the altruistic model toward estimates reported in the literature. The prior estimates have been interpreted as rejecting the altruism model.

Our empirical models, using data from the HRS and the WLS, indicate the biases suggested by the Monte Carlo simulations can be important. Child incomes, measured as a categorical variable in the HRS, are strongly, positively correlated with tied educational transfers (our other paper shows that tied transfers are positively correlated with parental income and wealth). Our analysis of WLS data has complementary strengths and weaknesses. Most importantly, we can condition on parental IQ, which can proxy for the recipient's unobserved ability, though our primary measure of child income is an occupational income score. The WLS results also suggest child outcomes are strongly, positively correlated with tied transfers. These preliminary results suggest new empirical tests (relative to those proposed in the literature) are needed to shed light on competing analytic models of transfer behavior.

Short description of the grant (purpose or aims)

Our ongoing research blends new theoretical work, which has a goal of better aligning analytic models of transfer behavior with their empirical patterns, and new empirical work. Our empirical work is based on the Health and Retirement Study (HRS), the Wisconsin Longitudinal Study (WLS), and the Surveys of Consumer Finances (SCFs), all of which have rich, complementary data on intergenerational transfers.

We have made substantial progress toward our 5 initial aims, which are reprinted below.
1. We will develop new analytic models of repeated transfers within the family, using noncooperative and cooperative behavioral models.
2. We will comprehensively examine the magnitudes and economic effects of intergenerational transfers that are tied specifically to education, and we will carefully examine the motives leading parents to make transfers to children through tuition payments or housing investment rather than direct financial transfers.
3. We will explore the empirical implications of cooperative models of intergenerational transfers.
4. We will examine the degree to which transfers are compensatory, which, in turn, has implications for the efficacy of the social safety net and the importance of altruistic motives for transfers.
5. Our final project has two primary aims. First, we look at the degree to which changes in the estate and gift tax affect transfers. Second, we examine how changes in labor supply, particularly retirement, affect transfers.

Progress to date

The first joint paper written by Professors Scholz, Brown, Mazzocco and Seshadri under this funding and described in the previous status report has led to the following two separate papers on transfers that are tied to children's educational investments.

"Tied Transfers" is available in draft form at the web sites of the co-investigators; one link to the paper is provided below. It has been presented in economics department seminars at Cornell University, the University of Michigan and the University of Missouri. We are currently rewriting the paper based on feedback we received in these seminars. We hope that the comments of participants in the

Intergenerational Workshop will help us as we assemble a final version of the paper to be submitted for publication.

"Tied Transfers and Child Outcomes" reports the empirical findings on transfers tied to post-secondary education that were presented by one of the co-PIs at a Princeton conference sponsored by the Russell Sage Foundation in 2004, along with some new findings. Further, the new version of the paper establishes the relevance of our empirical results on educational transfers to the broader debate over the motives for general parent-child transfers. We are currently modifying the rough draft circulated at Princeton in the spring of 2004. We hope to have a draft of this paper available for circulation shortly.

The co-PIs and Hisam Kim, a Wisconsin graduate student who has served as our project assistant for the past two years, have also made excellent progress on a series of related projects that the award has helped support. These are listed below.

Publications and presentations
List of Papers: Completed and working papers
"Tied Transfers," Meta Brown, Maurizio Mazzocco, John Karl Scholz and Ananth Seshadri, posted at http://www.ssc.wisc.edu/~mbrown/Tied_Transfers.pdf.

"Do Estate and Gift Taxes Affect the Timing of Private Transfers?" B. Douglas Bernheim, Robert J. Lemke and John Karl Scholz, *Journal of Public Economics, Volume 88, Issue 12, December 2004, Pages 2617-2634*.

"Equity and Efficiency Effects of Redistributive Policies," Ananth Seshadri and Kazuhiro Yuki, *Journal of Monetary Economics*, forthcoming.

"Savings, Risk Sharing, and Preferences for Risk," Maurizio Mazzocco, *American Economic Review, Volume 94, Issue 4, September 2004, Pages 1169-1182*.

"Household Intertemporal Behavior and a Test of Commitment," Maurizio Mazzocco, under review, http://www.ssc.wisc.edu/%7Emmazzocc/hibei.pdf.

"Informal Care and the Division of End-of-Life Transfers," Meta Brown, under review, http://www.ssc.wisc.edu/~mbrown/EstateDivision3.pdf.

"Parental Investment Between Children with Different Abilities," Hisam Kim, under review, http://www.ssc.wisc.edu/~mbrown/Kim.pdf.

In progress
"Tied Transfers and Child Outcomes," John Karl Scholz, Ananth Seshadri, Maurizio Mazzocco and Meta Brown.
"Labor Supply, Saving, and Marital Decisions," Maurizio Mazzocco, Luke Davis and Shintaro Yamaguchi.
"Tuition and Attention: What Motivates Transfers Over the Life-Cycle of the Family?" Meta Brown and Mark O. Wilhelm.

Presentations
Princeton meeting on inequality sponsored by the Russell Sage Foundation, May 2004
Cornell University Department of Economics, applied microeconomics seminar, October 2004.
University of Missouri Department of Economics, department seminar, November 2004.
University of Michigan Department of Economics, public economics seminar, December 2004.

Family Structure Dynamics and Child Outcomes,

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Description

The goal of this study is to analyze the interrelationships among family structure dynamics, employment dynamics, and child outcomes in the U.S. Given the frequency of divorce, remarriage, cohabitation, and out-of-wedlock childbearing in contemporary societies such as the U.S., as well as the frequency of labor market transitions by mothers of young children, understanding the mechanisms through which these events affect children and are affected by child outcomes is important for science and policy. The specific aims of the study are the following.

1. Conduct a comprehensive demographic analysis of the family structure experiences of children. We jointly analyze women's childbearing behavior and transitions among co-residential union states, defined as single, cohabiting and married. The analysis uses data from the 1979 cohort of the National Longitudinal Survey of Youth (NLSY79). The estimated model is simulated to provide a rich description and analysis of the family structure experiences of children from birth through age 18. A novel contribution is to analyze the determinants of the identity of men with whom a woman enters a co-residential union. A woman who has given birth to a child outside of a co-residential union is at risk of entering a union with the father of the child and with other men. This distinction is rarely made when analyzing relationship formation, but it is critical for understanding the family structure experiences of children. We use the results of our analysis to address a number of issues that have not previously been analyzed, as well as to provide new perspectives on previously-studied issues. These include the following: (1) How does transition from cohabitation to marriage affect the amount of time spent by children living with the biological father? (2) Which is more important in accounting for time spent by children without the biological father: being born outside a co-residential union, experiencing the end of a cohabitation, or experiencing a divorce? (3) What proportion of children born outside a co-residential union ever live with their biological mother and father together? (4) What fraction of all time spent by children with their biological mother and father jointly is accounted for the mother cohabiting with or marrying a man who previously fathered children with her outside a co-residential union?

2. Conduct an "approximate decision rule" analysis of the impact of marital and cohabitation dynamics and employment dynamics on child outcomes. Specify a dynamic production function for child outcomes as a function of exposure of a child to different marital arrangements, employment states of the mother, other observable inputs such as time and material resources provided by the mother, father, and others, exogenous determinants such as age and race, and unobserved heterogeneity. Specify reduced form functions explaining exposure of a child to different marital arrangements and maternal employment states as a function of exogenous determinants of preferences, policy and environment characteristics such as divorce laws, marriage market characteristics, and public assistance program parameters, and unobserved heterogeneity. Estimate the production function and input demands jointly, using rich longitudinal mother-child data from the NLSY. Identification of the causal impact of inputs on child outcomes relies on the timing of family structure and employment changes after controlling for unobserved heterogeneity. The child outcomes of interest include cognitive, social, and emotional development, educational advancement, health, and early adult outcomes such as childbearing,

employment, wages, and marital dynamics.

3. Specify a behavioral model of marital and cohabitation dynamics, female employment, and their effects on child outcomes, and obtain structural estimates of the parameters of the model. The model is specified so as to explain sequences of employment, cohabitation, marriage, divorce, and remarriage decisions, and the impact of these choices on children. It allows direct feedback from child outcomes to the marital and employment decisions via interactions in the utility function, as well as indirectly via forward-looking behavior. The dependence of these decisions and outcomes on female wages and current, previous and potential future partner's incomes are explicitly modeled, as are the role of benefits from public programs that are conditioned on marital status and/or employment, such as Temporary Assistance for Needy Families (TANF). Estimates of the preference and production function parameters will make it possible to provide a detailed characterization of the mechanisms through which marital and employment dynamics affect children, the mechanisms through which realized child outcomes affect marital and employment decisions, and the effects of policy on marital and employment dynamics and child outcomes.

Status Report
We have made progress in three areas:

1. We have invested substantial effort to construct integrated "co-residential relationship" histories for each woman and "fatherhood" histories for each child. Our initial pass through the data made us aware of the fact that there are numerous inconsistencies between reported dates of cohabitation and marriage that must be resolved. In many cases, the source of the inconsistency is an obvious coding or reporting error, and we have developed algorithms to detect and correct these. In other cases, the source of the inconsistency is not so obvious, and some judgment is required as to whether the data can be reconciled and used or must be discarded. Similarly, there is a large amount of information about the presence of the father or stepfather of each child in the household, but in many cases this information appears to be inconsistent over time or with the marital and cohabitation data. We have developed semi-clean versions of relationship and presence-of-father histories to use in order to make progress in the analysis. These files are based on substantial efforts to clean and reconcile the data, but roughly 10% of the sample was deleted because their data could not easily be reconciled. In the meantime, an experienced programmer is examining the difficult cases and developing algorithms to detect coding errors and inconsistent reporting. The result will be a much cleaner data file, that we will use in the final version of our analysis, and that we will fully document and make available to other researchers.

2. We have developed software that solves the behavioral model and simulates behavior based on the solution. This requires a substantial amount of debugging, testing, and sensitivity analysis. At this stage, we do not attempt to estimate the parameters of the model. Rather, we "calibrate" the model parameters to generate simulated behavior that resembles patterns we see in the data. This is an informal process and is not a substitute for estimation. Rather, we use this approach to determine how variation in key parameters of the model affects behavior and to determine plausible ranges for the magnitudes of parameters. We also use this process to determine which parts of the solution algorithm take the most computation time, and to look for ways to speed up computation. The program is generating simulated behavior that is becoming closer to the patterns observed in the data as we experiment with alternative values of numerous parameters.

3. We have completed a first draft of "A Demographic Analysis of the Family Structure Experiences of Children in the U.S." Results from this paper will be presented at the Intergenerational Workshop.

Parents' Schooling and Child Well-Being in Taiwan
Grant Number 5 R01 HD045603

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Description of Research

The specific aims of this project are to estimate the causal impacts of mother's and father's education on child health and child educational outcomes in Taiwan. Interest in this topic can be traced to the recent focus on the role of human capital in general and its two most important components--health and schooling--in particular in the determination of economic growth and to the evidence in many studies that parents' education has a positive and significant effect on a variety of measures of child well-being. There is much less consensus as to whether this correlation reflects causality from more schooling to increases in well-being. A number of investigators have argued that omitted "third variables" such as a future orientation or heritable ability may cause both schooling and well-being to rise. Our study exploits a natural experiment to estimate the causal impact of mother's and father's education in Taiwan. In 1968, the Taiwanese government extended compulsory education from six to nine years, which required all school-age children (between 6 and 15) to attend elementary school for six years and junior high school for three years. To accommodate the expected increase in enrollment in junior high schools, the government opened 140 new junior high schools, a seventy-percent increase, in 1968. This education reform created the largest expansion in junior high school construction and student enrollment in Taiwan's history. Our natural experiment exploits variations across cohorts in exposure to compulsory education reform and across regions in new junior high school openings per thousand children ages 12-14 (program intensity). We are estimating the impact of mother's and father's education on a variety of measures of child well-being by using cohort and program intensity in region of birth interactions as instruments for mother's education.

Child well-being measures pertain to health, education, and fertility. The last outcome is relevant because there may be tradeoffs between the number of children in the household and the well-being of each child. Infant health outcomes and related behaviors by mothers (also termed health inputs) considered in the project include birthweight; the probabilities of low- and very low-weight births; birthweight adjusted for gestational age; the probabilities of neonatal, postneonatal, and infant death; the probabilities of these death outcomes for normal-weight, low-weight, and very-low weight births; the trimester in which prenatal care began; the number of prenatal care visits; the receipt of such prenatal examinations as ultrasound and amniocentesis; maternal cigarette smoking, alcohol use, and labor market status during pregnancy; contraceptive practices;

knowledge of these practices; and breastfeeding. Child health outcomes and health inputs include the probabilities of death between the ages of 1 and 5 years from diseases and from accidents; anthropometric measurements and blood chemistry and urological laboratory determinations for children between the ages of 4 and 19 years; receipt of vaccinations for these children; cigarette smoking, physical exercise, and knowledge of appropriate diet for those over the age of 6; and alcohol consumption for those over the age of 12.

Educational outcomes include Joint College and University Entrance Examination scores; the probability of completing senior high school; the probability of attending university/college; and rank of university attended. With regard to rank of university, we can distinguish among the top five public universities, other public universities, and private universities (the least prestigious). Fertility outcomes include mother's age at marriage and at first birth, number of pregnancies, and desired family size.

Four data collections are being employed in the project. The first consists of all birth certificates and infant and child death certificates for the years 1978 through 2000. The second consists of two household-based surveys with detailed information on birthweight, prenatal care, and other maternal health behaviors during the pregnancy preceding the birth of the child for whom birthweight is obtained. These surveys are the fourth (1973), fifth (1980), sixth (1986), seventh (1992), and eighth (1998) rounds of the Knowledge, Attitudes, and Practice of Contraception in Taiwan: Province-Wide Fertility Survey (KAP 4, 5, 6, 7 and 8); and the National Health Research Institutes 2000 Survey of Health Status of Women and Children in Taiwan (NHRI 2000). KAP also has information on fertility, breastfeeding, and contraceptive knowledge and practices. The first (1993-1996) and second (1998-2002) Nutrition and Health Survey in Taiwan comprise our third data collection. The final data collection has college entrance examination information and type of college attended for the years 1996 through 1999. The last two data collections will be linked to birth certificates to obtain parental characteristics.

To obtain estimates of the causal effects of mother's schooling, we consider females between the ages of less than 1 and 20 in 1968. Those over the age of 11 were unlikely to be affected by school reform, while those 11 years of age and under were very likely to have been affected by it. Moreover, there was considerable variation in the number of new junior high schools per thousand children between the ages of 12 and 14 that opened in 1968. Hence we employ the products of cohort indicators and program intensity as instruments for schooling. Greater intensity among younger cohorts should lead to more schooling but should be uncorrelated with unmeasured determinants of the well-being of the offspring of these cohorts. A similar methodology will be employed to estimate the causal effects of father's schooling.

Some key questions that are addressing are: What are the causal effects of mother's and father's schooling on many measures of child well-being in five large data collections? Is the effect of mother's schooling larger than that of father's schooling? Do twins born to more educated parents do better in terms of health and schooling than those born to less educated parents? What lessons can underdeveloped countries learn from school policies adopted by Taiwan during its period of rapid economic growth?

Status Report

Since the grant was funded on September 26, 2003, Taiwanese birth and infant death certificate files for the years 1978-1999 were prepared for analysis. In addition the first draft of a paper based on this database and entitled "Parental Education and Child Health: Evidence from a Natural Experiment in Taiwan" was completed. Infant health outcomes considered include the probability of a premature (gestation less than 37 weeks) birth; the probabilities of low-(less than 2,500 grams) and very-low weight (less than 1,500 grams) births; and the probabilities of neonatal (within the first month of life),

postneonatal (between the second and twelfth month of life), and infant (within the first year of life) death. Results from ordinary least squares (OLS) estimation suggest that higher parental schooling levels significantly reduce the risk of all adverse infant health outcomes considered. Moreover, the magnitudes of the mother's and father's schooling effects are about the same in absolute value. Results from two-stage least squares (TSLS) estimation, which take account of biases due to omitted third variables, tell a somewhat different story. The impacts of mother's schooling on the probabilities of prematurity, low birthweight and very low birthweight are significant, larger in absolute value than the corresponding OLS estimates, and also larger than the TSLS impacts of father's schooling. On the other hand, father's schooling, but not mother's schooling, has significant effects on neonatal and infant mortality in TSLS. These results, especially the last one, must be regarded as preliminary because they are somewhat sensitive to the selection of treatment and control groups. Moreover, they do not consider birthweight-specific infant mortality or child mortality (deaths between the ages of one and five) as outcomes.

In addition to the preparation of the paper, we have begun to prepare three other databases for analysis. They include the Joint College and University Entrance Examination (JCUEE) File; the first and Second Nutrition and Health Survey in Taiwan (NHSIT 1 and NHSIT 2, respectively); and the fourth (1973), fifth (1980), sixth (1986), seventh (1992), and eighth (1998) rounds of the Knowledge, Attitudes, and Practice of Contraception in Taiwan: Province-Wide Fertility Survey (KAP 4, 5, 6, 7 and 8). The first data set will employ child well-being measures pertaining to educational outcomes, while the second one will employ health measures and behaviors such as cigarette smoking for children between the ages of four and nineteen. The KAP surveys will be used to examine a variety of outcomes including birthweight; the trimester in which prenatal care began; the number of prenatal care visits; the receipt of such prenatal examinations as ultrasound and amniocentesis; maternal cigarette smoking, alcohol use, and labor market status during pregnancy; contraceptive practices; knowledge of these practices; breastfeeding; mother's age at marriage and at first birth; number of pregnancies; and desired family size.

Papers

Chou, Shin-Yi; Liu, Jin-Tan; Grossman, Michael; and Joyce, Theodore. "Parental Education and Child Health: Evidence from a Natural Experiment in Taiwan." Working Paper, December 2004.

Family Support and Rapid Social Change in South Africa
Grant Number 1 R01 HD045581-01

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Background for the Project:
Since the end of apartheid in 1994, South Africa has experienced rapidly expanding opportunities combined with enormous challenges. Apartheid left a strong footprint on the new democracy that began in 1994, with high levels of poverty and one of the most unequal distributions of income in the world. Recent evidence suggests that these levels of poverty and inequality have persisted, although major progress has been made in equalizing access to services such as housing, water, and health. Unemployment rates remain extremely high, and the rapid growth of the HIV/AIDs epidemic has added additional pressures on South African families. Against this backdrop, this project brings together a team of American and South African researchers to study patterns of intergenerational support in South Africa. Given the combination of high unemployment, the impact of HIV/AIDS on the working age population, and a welfare policy that is dominated by an extensive state old-age non-contributory pension, family support structures in South Africa are unusually complex. Among the poor the majority of resources often flow into households from the elderly, while working age adults and children are often net resource consumers. This raises a number of important research questions about how family support systems work in an environment characterized by extreme stress and an unusual age profile of resource flows.

Our project is interested in questions such as the following: What role does the complex household structure of black South Africans play in solving intergenerational resource allocation problems? How do families and households respond to events such as the unemployment or death of working age adult household members? What impact does the generous state old-age pension have on the welfare of the elderly and the non-elderly? To what extent are the pensions redistributed within and across households? How are private transfers, such as remittances from absent household members, affected by pensions? How do young people make the transition from being dependents to being contributors to household support, and how does this interact with pensions and other sources of household income? Do men and women allocate pension income differently within the household? Does it matter whether income is received by men or women, young or old, in terms of the impact on household consumption, the schooling of young people, or the labor supply of adult household members?

Major Project Objectives:

In order to analyze these complex questions we are using a combination of existing data sets and original data collected as part of an ongoing longitudinal survey of young adults in Cape Town. An important focus of our work with existing national data sets, including the 1996 and 2001 census 10% samples, the 1995 and 2000 Income and Expenditure Surveys (IES), and the semi-annual Labor Force Surveys, is analysis of changes in poverty and inequality over the post-apartheid period, with particular focus on how the changes interact with public transfer programs and household living arrangements. An important part of this work is the use of the income and expenditure data to analyze intra-family resource allocation by age and gender, including how these allocations vary by race and income. We are particularly interested in the allocation of resources to the elderly and children, and in how the welfare of these dependents has changed during the post-apartheid period.

Given the importance of the state old-age pension, we are also interested in how these pensions are redistributed within the household, looking at the impact of pensions on consumption of goods that can be linked to specific age and gender groups. We are estimating expenditure regressions to test whether income from pensions or child grants has a different impact than other sources of income, and whether there is a differential effect of income transfers received by men versus women. In particular, we are interested in testing whether some sources of income are more likely to be redistributed to other generations within the household. We are also estimating the impact of pensions, child grants, and other sources of income on outcomes such as schooling and employment of young people, using both direct data on transfer income and the strong age discontinuities in pension eligibility. We are also interested in the impact of pensions on labor supply of adult household members, including the pension recipients and their spouses.

One of our potentially most valuable sources of data at the national level is the semi-annual Labour Force Survey (LFS), which has an overlapping panel structure similar to the United States Current Population Survey. We are working on methods of linking individuals across waves of the LFS, which began in 2000. We plan to use these panel data to analyze transitions in employment, schooling, and household composition. We will estimate the impact of job loss on outcomes such as the schooling and labor supply of other household members, focusing on the differential impact by age and gender.

One of the most exciting parts of the project is the original data that will be collected as part of the Cape Area Panel Study (CAPS). CAPS is a longitudinal survey of young adults in Cape Town that was started in 2002 with support from a previous NICHD grant ("Families, Communities, and Youth Outcomes in South Africa"). A representative sample of 4,800 young adults age 14-22 in metropolitan Cape Town was first interviewed in 2002, with most of them having been re-interviewed once in either 2003 or 2004. We plan to re-interview the entire sample in 2005, and to extend the study with new modules specifically focusing on family support and intergenerational transfers in 2006. CAPS provides detailed data on issues that are central to our project. These include information on positive and negative shocks such as death, illness, job loss, and the beginning or end of public transfers, along with longitudinal data on the school and work activity of young adults and unusually rich data on non-coresident relatives such as fathers and grandparents. The existing survey will be supplemented with a number of "family support" modules in 2006. These include modules on intergenerational transfers to and from the young adults (who will then be age 18-28), expectations regarding kin obligations among young adults, and detail on the uses of government grants (especially child grants and old age pensions).

Current Status of the Project:

Activity during the first year of this project was limited due to a long delay in obtaining foreign clearance for the project. This restricted our ability to carry out activities at the University of Cape Town, putting us about one year behind on the planned supplement to the Cape Area Panel Study, with the fieldwork now scheduled for 2006 rather than 2005. Other dimensions of the project have moved rapidly forward. An important focus of the first year of the project was taking stock of the existing set of national census and survey data that can be used to look at how family support interacts with the rapid changes in economic and social conditions in South Africa since the end of apartheid. A series of papers coming out of the project have looked at changes in poverty, income inequality, and household resources since 1994. A number of serious methodological issues affect analysis of these changes, and there is ongoing debate in South Africa about questions as fundamental as whether poverty increased or decreased between 1995 and 2000. Members of our team have been centrally

engaged in these debates, including analysis of key methodological issues such as the imputation of missing income data in census and survey data. Several important conclusions emerge from these papers. There was almost surely an increase in poverty and income inequality between 1995 and 2000 (Leibbrandt et al. 2004, Leibbrandt et al. 2005), with increased convexity in returns to schooling being one contributing factor (Lam and Leibbrandt 2004). The magnitudes of these changes can be sensitive to the choice of data set and methodological issues, but the direction of the changes appears to be robust (Leibbbrandt et al. 2004, Ardington et al. 2005). This negative performance was offset by substantial improvements in service delivery to the poor in areas such as housing, water, and health care (Leibbrandt et al. 2004). Access to the state old-age pension was an important source of income to poorest households, and helped offset declines in labor earnings at the bottom of the income distribution (Lam and Leibbrandt 2004, Lam et al. 2004). It also appears that there were substantial changes in household composition, including a large decline in average household size, that interact in complex ways with the changing distribution of household income (Lam and Leibbrandt 2004).

Current work continues to look at these issues, drawing on more recent data from the Labour Force Survey and focusing more closely on the role of changing household composition. We are also looking closely at the important role played by the old age pension. Extending the work in Lam, Leibbrandt, and Ranchhod (2004), which shows a significant decline in labor force activity when the age of pension eligibility is reached, we are looking at the impact of one spouse's pension eligibility on the other spouse's labor supply, and the interaction of this effect with the presence of children and other adults in the household. This work draws heavily on the 10% census sample, since it has sufficiently large numbers of elderly couples to support such analysis. We are also using the income and expenditure surveys to look at the impact of pensions on child-related expenditures.

The other major focus of current activity is preparations for the family support modules that will be embedded within the Cape Area Panel Study in 2006. A major planning workshop will be held at UCT this June, and the 2005 wave of CAPS will include many questions that will create a foundation for the 2006 modules. We are also beginning to work on a survey in the rural Eastern Cape province, the primary source of migrants to Cape Town, that will explore the possibility of linking CAPS respondents in urban Cape Town to their extended family members, many of whom will be linked by extensive networks of intergenerational remittances.

Working Papers and Publications:

Ardington, Cally, David Lam, Murray Leibbrandt, and James Levinsohn, "Savings, Insurance and Debt Over the Post-apartheid Period: A Review of Recent Research," *South African Journal of Economics*, 72(3), September 2004.

Ardington, Cally, David Lam, Murray Leibbrandt, and Matthew Welch, "The Sensitivity of Estimates of Post-apartheid Changes in South African Poverty and Inequality to Key Data Imputations," Dept. of Economics, University of Cape Town, February 2005.

Lam, David, Murray Leibbrandt, and Vimal Ranchhod, "Labor Force Withdrawal of the Elderly in South Africa," presented at the National Academy of Sciences conference on Aging in Africa, Johannesburg, South Africa, July 2004.

Lam, David, and Murray Leibbrandt, "What's Happened to Inequality in South Africa since the End of Apartheid," University of Michigan, January 2004.

Leibbrandt, Murray, Laura Poswell, Pranushka Naidoo, Matthew Welch, and Ingrid Woolard, (2004) "Measuring Recent Changes in South African Inequality and Poverty Using 1996 and 2001 Census Data" Working Paper 84 Centre for Social Science Research, Univ. of Cape Town, November 2004.

Leibbrandt, Murray, Jim Levinsohn, and Justin McCrary, "Incomes in South Africa since the Fall of Apartheid," presented at the UCT/Santa Fe Institute Conference on Social Dynamics, Cape Town, January 2005.

Intergenerational family resource allocation in Guatemala

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A. Aims
A.1: Study overview

Rising life expectancy and falling fertility rates are leading to marked increases in the proportion of elderly persons in most of the world. While this phenomenon is the subject of extensive analysis and policy debate in developed countries, it has received comparatively little attention in developing countries despite the fact that the proportion of the elderly in developing country populations is estimated to treble by 2050. This increase coincides with slow progress in many developing countries in addressing poor levels of nutrition, schooling and health amongst young people. In Guatemala, for example, between 1969 and 2002, life expectancy has risen from 53 to 68 years for women and from 51 to 62 years for men, yet approximately 25 percent of children under five are malnourished and secondary school enrolment rates are below 20 per cent for both boys and girls. In both public and private domains, critical investments in children may increasingly compete with the need to support elderly parents.

We are undertaking a study to advance understanding of the roles played by public policy, private resources, preferences, exogenous shocks and markets – and the interactions amongst these factors – in the allocation of resources, and the consequences for well-being of these allocations, across three generations in Guatemala. The setting is four villages in the *Oriente* (Eastern) region and the localities to where people from these communities migrated. A unique feature of our study is that it builds upon more than 30 years of data collection and interaction with these communities. Beginning in 1969, parents and children participated in a well-known longitudinal study by the Institute of Nutrition in Central America and Panama (INCAP) that is rich in data about home environment, growth, cognitive development, diet and morbidity. A follow up study carried out in 1988 provides data on human capital and productivity when the subjects were 11 to 26 years of age. In 2002-04, in a study support by the NIH Fogarty International Center, we interviewed these subjects now aged 25 to 41 on livelihoods, wealth, life histories, and health status (the Human Capital Study, HCS). Together with survey work about to be undertaken in this study, we will have data on the allocation of resources across three generations: G1 (elderly parents), G2 (their children, most of whom are now "middle-generation" parents) and G3 (grandchildren of G1). As such, this will be the first study to link prospectively collected data on investments in children's human capital with subsequent interactions and investments between these individuals, their offspring *and* their aging parents. The study is a collaborative effort between researchers based at the Population Studies Center – University of Pennsylvania, the International Food Policy Research Institute, the Department of Global Health of the Rollins School of Public Health of Emory University, and INCAP. We have an interdisciplinary research team with expertise in anthropology, demography, economics, epidemiology, medicine, nutrition, and psychology.

A.2 Research themes and preliminary hypotheses:

A.2.1 Theme I: Allocating resources across generations: Middle-generation parents face a trade-off in the allocation of time dedicated to work, to elder and child care, and to leisure and in the allocation of income to their own consumption, to meeting the consumption needs of their elderly parents, and investments in the human capital of their children. This allocation problem is affected by factors such as: altruism; the level of resources available to elderly (G1) parents; resources available to middle-generation (G2) parents; access to markets for capital, for insurance and for services (e.g., child care); shocks experienced by all generations; policies related to safety nets and old-age pensions; norms regarding elder care; the value placed on privacy; attitudes towards inequality in outcomes amongst children. We hypothesize that: (1) Economic development will improve the living standards of the elderly if their "portfolio" of children can engage in more remunerative and diversified activities. Offsetting this is the development of capital and insurance markets that weaken adherence to "family transfer rules" and weaken risk-sharing motives for intergenerational interactions by providing alternative sources of insurance. The development of new public goods (e.g. television) increases incentives for co-residence while others (e.g., fewer children) reduce incentives for co-residence. (2) Increasing wages causes financial transfers from G2s to G1s to rise if such transfers are motivated by altruism, causes financial transfers from G2s to G1s to fall if these flows are the outcome of bargaining across generations and causes financial transfers to increase while allocations of care and attention to fall if higher wages induce G2s to enter the labor market and spend less time at home. (3) Care of elderly parents requires that adult siblings resolve a collective action problem that is conditioned by norms regarding the sharing of the burden of elder-care, differences in resources available to each sibling, the level and distribution of past investments made by G1s in G2s, decisions regarding co-residence and migration, and marriage market outcomes for G1s and G2s.

A.2.2 Theme II: The impact of resource allocation decisions on the well-being of the elderly and the young: We will examine the consequences of these interactions for the well-being of the elderly and the young, taking a broad view of well-being to include for the elderly: housing quality, physical and mental health, access to preventive/curative health care, satisfaction with health status, social resources, and economic resources. For the young, well-being will include health, nutrition, adequate care, schooling and cognitive skills. We hypothesize: (1) Allocations by G1s to G2s and by G2s to G3s, and changes in the level and distribution of these across generations are conditioned by levels and changes in public and parental resources, the extent to which parents tradeoff productivity versus equity in these investments and how development changes such tradeoffs. (2) Shocks to any generation may affect the outcomes of both the elderly and the young. The elderly can be both a source of such shocks, but also a form of insurance, providing resources (money, child care) that benefit their children grandchildren.

A.2.3 Theme III: The gender dimension to intergenerational resource allocations: The analysis of intergenerational allocations cannot be gender blind. We hypothesize: (1) Forms of interactions between middle-generation individuals and elderly parents, or parents-in-law, are differentiated by gender. Where males engage in wage labor while their spouses and sisters remain outside the labor force, males may provide financial transfers while females provide time-intensive care. If economic development results in gender gaps in wages falling, a shift from females to males or to hired assistance occurs. (2) The relative strength of partners within a union depends on the assets they bring to the union, those that are under their control and those of their parents. These relative strengths affect the allocations of resources to children and to parents versus parents-in-law. (3) Allocations by parents to their children are gender-differentiated where returns to schooling differ by gender or where parents have unequal concern for sons and daughters.

B. Research Design and Methods - Analytical Plan

B.1 Time line

The study, which began in September 2004, will continue until June 2009. We have completed the fieldwork component of our qualitative study of inter-generational interactions. We have held two planning meetings to begin development of survey instruments and have constructed a preliminary listing of eligible G1s, G2s and G3s. Pilot testing and refinement of survey instruments for the quantitative component of our study will occur over the next few months as will the hiring and training of the supervisory and field staff. Data collection will begin in the summer of 2005 and will shift to Guatemala City and other localities in Guatemala in 2006. Data cleaning will be a continuous process. We will begin carrying out descriptive analyses a few months after data collection commences as part of data quality control. Analysis and writing will be concentrated in years 2007 to 2009.

B.2. Quantitative Data Collection

B.2.1. Overview: Data collection will cover three generations of families who participated in the original nutrition intervention trial conducted during 1969-77: G1 (older adults), G2 (their children) who participated in the nutrition intervention and G3 (grandchildren of G1). Interviews will take place in the original study villages, Guatemala City and (possibly) selected localities elsewhere in Guatemala.

B.2.2. Data pertaining to G1s: This will include: health status; mental competence; psychological functioning; living arrangements/co-residence; income, on transfers received and given in the form of money, in-kind, attention and help; the value placed on privacy, a clinical assessment and assessment of cognitive function.

B.2.3. Data pertaining to G2s: There are three categories of G2s, those who participate in the HCS (individuals born between 1962 and 1977); the spouses of these individuals who were not part of the original nutrition intervention; and those that do not participate in the HCS, either because they were not successfully interviewed in the HCS, were born before 1962 or after 1977, or are new partners. We already have considerable information on G2s participating in the HCS and their current spouses. including occupational, educational, health, nutrition and marriage histories and so their survey instrument will focus on updating this information. In addition we will collect information on: G2's perceptions of recent "shocks" experienced by G1, G2 or G3; G2's health assessments for all three generations; transfers and other interactions between the siblings of G2 and G1; and the value of privacy for G2. For siblings of these G2s who are not part of the HCS, we will design a short questionnaire eliciting information on their education attainments, current occupation and residency.

B.2.4. Data pertaining to G3s: Data collection methods pertaining to G3s will include: assessments of the home environment and parenting, child cognitive functioning, child anthropometry and health and schooling.

Credit and Impact: Examining a Policy Experiment

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Project Description: A large literature has explored the importance of credit constraints, both their theoretical relevance to the consumption, saving and investment decisions of individuals, and the evidence for them in the real world. On the theory side, it is generally assumed that credit constraints are of greater importance in developing countries and among poorer populations (who have less assets to use as collateral) and many papers have posited that credit constraints act as a major obstacle to economic development, growth, and poverty alleviation.[1] These theories provide strong motivation to empirically test for credit constraints. Most empirical evidence for credit constraints can be reasonably divided into two types. The first type of work tests well-defined structural models, but uses data where the exogeneity and identifying assumptions are a priori doubtful. For example, the cross-sectional correlation between investment decisions and some measure of current liquidity (such as income or wealth) is cited as evidence for credit constraints based on a model where the distribution of current liquidity is assumed exogenous to other factors affecting investment.[2] Papers of the second type apply plausibly exogenous variation, from a natural, policy, or controlled experiment, but lack the structure of a model to aid in identifying credit constraints and extrapolating results beyond the experiment itself. For example, the high estimated wage gains from instrumental variables methods have been cited as evidence for credit constraints in schooling investment.[3]

This paper follows the first type of research in testing a full specified structural model but follows the second line of research in using an exogenous variation from a policy experiment to evaluate the model's predictions. That is, we develop a model with strong theoretical predictions for agents' behavior in the presence of potential credit constraints, including predictions for the impact of counterfactual credit interventions on behavior. We estimate the model using non-experimental panel data from rural and semi-urban households in Thailand, but then evaluate the model by comparing the actual data from a government policy experiment to the model's predictions for this experiment.

The model we develop is based on the standard buffer stock model for savings behavior under income certainty which has been studied by many authors.[4] Our model follows Aiyagari (1994) and Deaton (1991) in that agents' levels of liquid assets are bounded below by a (typically non-positive) multiple of their permanent income. Though their discount rate exceeds the rate of return on liquid savings, agents often maintain savings above this bound as a precautionary buffer

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[1] See, for example, Banerjee and Newman (1993), Galor and Zeira (1993), Ghatak and Jiang (1999), Gine and Townsend (2001), Lloyd-Ellis and Bernhardt (2001), and Owen and Weil (1997), all of which incorporate indivisible investments.

[2] Related approaches been used to test for credit constraints in the choice of consumption (e.g., Townsend (1995), Zeldes (1989), Attanasio and Davis (1996)), investment (e.g., Alem and Townsend (2002), Sampantharak (2003), Fazzari et al (1988)), entreprenuership (e.g., Townsend and Paulson (2002), Evans and Jovanovic (1989) and education (e.g., Blossfeld and Shavit (1993), Kane (1994), Cameron and Heckman (1998), Cameron and Heckman (2000))

[3] Card (1999) and Krueger (2003) are two examples. Carneiro and Heckman (2001) and Cameron and Taber (2002) critique the interpretation of these results.

[4] Important contributions include Aiyagari (1994), Carroll (1997), Carroll and Samwick (1997), Deaton (1991), Gourinchas and Parker (2003), and Zeldes (1989).

against income uncertainty. In our model, agents have the additional option of investing in an asset (or project) that pays a higher rate of return than liquid savings. This asset, however, is, indivisible and illiquid, paying out by increasing permanent income. Furthermore, the size of the indivisible project is stochastic.

This simple wrinkle is motivated by the importance of small but lumpy and sporadic investments (e.g. tractors, livestock, small business start-ups, and land purchases) in the Thai context, but also produces strong, novel theoretical predictions. As an example, comparing agents with the same permanent income, consumption is no longer monotonically increasing in current liquidity since at some threshold level of liquidity it pays to reduce consumption and invest in the indivisible asset. Consequently, an agent may appear more liquidity-constrained when receiving a relatively high transitory income shock than when receiving a lower transitory income shock. As a second example, the model predicts that agents who borrow to consume will be more likely to default on credit than agents who borrow to invest, since investments will increase future permanent income. Higher permanent income increases access to credit and allows agents to repay old loans through the use of new credit.

The model is empirically estimated and tested using data from the Townsend Thai project, an ongoing (1997-present) panel survey of a stratified, clustered, random sample of institutions (256 in 2002), households (960 each year) and household businesses (658 in 2002), and key informants (64, one for each village) in four provinces of Thailand. The model parameters are estimated via GMM using the first five years of "pre-experiment" data.

The policy experiment we use to test the model is the Thai "Million Baht" village fund program, the largest scale government microfinance initiative of its kind. Started in 2001, the program involved the transfer of one million baht to each the nearly 80,000 villages in Thailand to start village banks that lend to village members. The transfers themselves sum to about 1.5 percent of Thai GDP and conceivable among the largest exogenous injection of private credit into an economy of its size.

We view the program, an initiative of the then newly elected Prime Minister Thaksin Shinawatra, as an "experiment" in that both the rapid introduction and the design of the program produced exogenous variation in available credit over time and across households. All sixty-four villages in the Townsend Thai panel data received the transfer and began lending between the 2001 and 2002 survey years. More importantly, the total amount of funding given to each village was the same (one million baht) regardless of the size of the village, so village size gives us a potentially exogenous source of variation in treatment (i.e. credit injection) per household. Indeed, we show that village size is only associated with the variables of interest after the introduction of the program.

We use the "Million Baht" program to the test the buffer stock/illiquid investment model of credit constraints, the effectiveness of microfinance interventions, especially such a large scale government program, is itself a matter of great importance. Proponents of microfinance argue that the unique policies of microfinance enable institutions to bring credit and savings services to underdeveloped areas and people with otherwise insufficient or no access to contemporary financial systems. The hope and claim is that the provision of saving and credit is both effective in fighting poverty and more financially viable than other means. Detractors point to the frequent failure of microfinance institutions and reliance, implicitly or explicitly, on subsidies. Despite the prevalence of such microcredit initiatives, there has been little serious empirical examination of their impacts. The few efforts to evaluate the impacts of microfinance institutions using quasi-experimental or instrumental variable methods have produced mixed or contradictory results.[5] Ours is the first structural attempt at such an evaluation.

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[5] Pitt and Khandker (1998), Pitt et al (2003), Morduch (1998), Coleman (1999), Ravicz (2000), Woolcock (1999), Aportela (1998)), and Gertler, Levine and Moretti (2003) are examples. Kaboski and Townsend (2003) estimates positive impacts of microfinance in Thailand using non-experimental data.

The work is also related to the current literature on the uses and relative merits of structural models and exogenous instruments or natural experiments in the estimation of treatment effects (e.g. Heckman, Urzua, and Vytlacil (2004), Rosenzweig and Wolpin, 2000). We argue that the great benefits of having exogenous variation are in estimating and testing theoretical models, not in allowing the researcher to eschew theory and structural models. First, in line with Heckman, Urzua, and Vytlacil, we show that in theory different instruments (or different credit policies) can produce different estimated treatment effects and that heterogeneous impacts across individuals can confound the interpretation of treatment effects. That is, in the context of our model, the effect of "treatment" depends on an observed state (liquidity) and two unobserved states (permanent income and the size of potential project) of a household. Our model highlights even more potential complications in measuring and interpreting treatment effects estimated via atheoretic methods. Namely, the measurement and interpretation of treatment effects is complicated by (i) multiple dimensions of impact and (ii) non-linear relationship between the sizes of impacts and treatments, even when impacts are properly measured.

Project Status: The model is complete and we have written the codes to computationally solve the model and estimate via GMM. We currently have simulation results of the model, and these have yielded interesting theoretical results. We do not yet have estimates from the pre-experimental data, nor have we incorporated the experiment into the simulations yet. On the astructural side, we have run 2SLS regressions on various credit, lending, saving, investment, and other outcome measures. Based on these astructural regressions, it appears that credit, small agricultural investments, consumption, and income growth have increased as a result of the program, but so has default and assets have decreased. These results are presented in the paper below.

Papers:
Kaboski, J. and Townsend, R. "The Impact of Credit – An Early Evaluation of a Large-Scale Government Credit Injection," mimeo, 2004