Intergenerational Transfers In Rural Chinese Families: A Corporate Model of Exchange Across Three Generations

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Abstract

This investigation studied whether childcare provided by older grandparents to their grandchildren was reciprocated in the form of three types of support from adult children: financial, instrumental, and labor to the family farm or business. Data came from a 2001 survey of 1,421 grandparents aged 60 years and older living in rural Anhui Province, China who reported about their relationships with 4,289 adult children with dependent children. Random effects Tobit models revealed that geographically more distant children reciprocated for the childcare of grandparents by providing them with financial remittances of greater value, while nearer children reciprocated by providing greater contributions of labor to family farms or businesses. After removing the suppressing effects of health, grandparents who provided more childcare received greater instrumental support from their adult children. Results support a corporate model of the traditional Chinese family in which intergenerational exchanges tend toward equilibrium and multiple family needs are met.

The family serves as the primary source of old-age support for the Chinese elderly, especially in rural China where more than two thirds of the elderly depend on their children for financial support (Shi, 1993, Xu & Yuan, 1997; Yuan, 1987), and where virtually all elders in need to rely on relatives for instrumental assistance and personal care (Ikels, 1997; Wu, 1991; Hong and Tracy, 1999; Liang and Gu, 1989). Dependence on adult children is virtually the only option available to older adults in rural areas of China since only about 6% of the rural older population is pension eligible (McCallum, 1989), and community health and social services are rarely available in these areas (Li and Martin, 1999).

In China, the duty of adult children to care for their aged parents is both an institutionalized norm and a right protected by law. These dictates are reinforced by filial piety, a fundamental belief of Confucianism emphasizing the moral obligation of younger generations for older family members (Yuan, 1990; Ganschow, 1978; Davis-Friedmann, 1991; Wu, 1994). However, rapid economic change brought about by recent market reforms in China is casting doubt concerning the ability of the Chinese family to function in support of its older members. As a result of the expansion of employment opportunities in urban areas, young adults are moving in large numbers from rural and agricultural regions to pursue job opportunities in urban factories and businesses many miles from their home villages and towns (Goldstein, Zhigang & Goldstein, 1977). The effect of this mobility is to depopulate rural regions of young adults, and increase geographic separation between adult children and their older parents (Xia, 1997), At the same time, privatisation of farm collectives has shifted responsibility for elder care from the village collective to the family work unit, increasing the pressure on families to care for their own (Ikels 1993; Lee and Xiao (1998).

Grandparent caring for grandchildren. Older grandparents may serve as caregivers, and even surrogate parents, to their grandchildren who are left by job-seeking parents. As Chen, Short, and Entwisle (2000) point out, day-care in rural areas of China are scarce, thus making grandparents valuable resources when parents need to work. Although the extent to which grandparents contribute to the childcare of their grandchildren is difficult to gauge, evidence from Taiwan and other east Asian nations show coresidence rates between grandparents and their grandchildren at about 50% (Hermalin, et. al., 1998). The essential contribution of grandparents for the care of grandchildren has been in rural Taiwan where local labor shortages and troubled farm economies provide elders with roles that insure the economic productivity of their children (Sando, 1986). Taken together this evidence suggests that childcare by grandparents—with or without the parent present--may allow adult children to seek out more promising labor markets locations, or work more productively in family businesses and farms. However, little is known specifically about the contribution of grandparents to family systems in contemporary rural China or the dynamics of intergenerational exchange across three generations in these families.

In this investigation we examine whether grandparents in rural China who provide more care for their grandchildren also tend to receive greater resource transfers from the parents of those grandchildren. We also take into account the moderating role that geographic distance plays in structuring the exchange between older parents and their adult children. In doing so we characterize transfers in the multigenerational family as optimizing the redistribution of family resources to insure that the needs of each generation are mutually satisfied. For instance, in Taiwan grandparents who provide child-care to their grandchildren enabled the job-related migration of their adult children, which, in turn, enabled greater remittances to be sent back to

the grandparent (Sando, 1986). Such a model of interdependence between the generations treats intergenerational transfers as strengthening the family system, and, as jointly in the self-interest of both sender and the receiver.

Models of intergenerational exchange. Our theoretical conceptualization of intergenerational exchange derives from several broad traditions in the study of transfers within the older family: reciprocity and family systems theory. Theories of reciprocity share the premise that social relationships are governed by a norm of reciprocity–the expectation that a debt should be repaid (Emerson, 1981; Gouldner, 1960; Molm & Cook, 1995). While most often applied to exchanges of financial assets, models of reciprocity have been extended to other currencies of exchange such as services and sentiments (Homans, 1974). Models of reciprocity have a strong basis in rational choice theory (Becker, 1974). A key aspect of this perspective is that there is an implicit cost to benefit calculation, whereby actors transfer valued resources to others in order to attract reciprocation of equal or greater value. The idea that intergenerational exchange relations strive toward balance or symmetry is a powerful model that has been used to explain many forms of reciprocal intergenerational exchanges in the fields of microeconomics (Cox, 1987; Bernheim, Shleifer, and Summers, 1985), social demography (Agree et. al., 2002; Henretta, Hill, Li, Soldo, & Wolf, 1997; Silverstein et. al. 2002) and social psychology (Antonucci, 1990; Morgan, Schuster, & Butler, 1991; Whitbeck, Simons, & Conger, 1991). Much of the research on intergenerational exchanges in families in the developed world focuses on serial transfers, often taking place over long periods of time (such as the case with bequests) and with lengthy delays in the fulfilment of reciprocity (see Silverstein et. al., 2002).

Another line of thought in family sociology has stressed the systemic nature of families. Unlike rational choice theory--which assumes that actors are motivated to maximize their gain from intergenerational transactions--family systems theory rests on the assumption that survival of the kinship unit is a paramount goal for those making transfers to other family members. Where rational choice theory stresses the *personal* costs and rewards of intra-familial transfers, systems theory stresses the interconnectedness of individuals and the diffusion of resources through linked actors in the family system. Implicit in the systems formulation is the notion that the family is a social organization that strives toward equilibrium by redistributing resources to where they are most needed (Klein & White, 1996; Broderick, 1993; Broderick & Smith, 1979). In societies with few public supports, family members are most often intertwined in a mutually supportive web of transfers that optimizes the satisfaction of both personal and communal family needs.

In China, the absence of universal public pension and long-term care programs means that families serve virtually all the needs of their older members. This is especially true in rural China, where 70% of elders received income transfers from adult children accounting for about one-third of their total income (Lee and Xiao (1998). The Chinese family has been the focus of several studies that have conceptualized its social organization as a network structure through which the diffusion of resources promotes systemic integrity and maximizes individual well-being (Agree et. al., 2002; Lee, Parish, and Willis, 1994; Sun 2002; Yang 1996; Hermalin et al, 1998).

Two related models of reciprocal exchange have been used to describe the interdependence of family members in China and other developing Asian nations: the mutual aid

model and the corporate-group model. The mutual aid model specifies that transfers between generations are made as needs in each generation arise, as a sort of insurance policy against unmet need. In Asian families the "time-for-money" hypothesis is often advanced under the mutual aid model, where parents provide household labor and/or child-care services to the families of their adult children, and adult children transfer money to their parents (Lee, Parish & Willis, 1994; Frankenberg, Lillard, & Willis, 2002).

The heuristic of the corporation has been used to describe the propensity of the Chinese family to fluidly redistribute resources in a system of interdependent actors. Lee, Parish, and Willis (1994) define motivations of parents in a corporate system are "to share the fruits of their investment in their children". Parents who invest in the education of their children are an example of systemic action. Such an investment in human capital better insures old age support since successful children are better situated to provided intergenerational transfers to their parents (Lillard and Willis, 2002; Whyte, 1993; Riley, 1994; Frankenberg, Lillard, & Willis, 2002).

The mutual aid and corporate models share the dynamic of reciprocity in exchanges between generations. Investing in a child's education is a long-term strategy for reducing uncertainty about old age support, while taking care of grandchildren so adult children can attain better wages is an immediate strategy to attain the same outcome. Indeed, the capacity of adult children to provide economic support to their older parents may hinge on the support that their parents are and were able to provide to them. This suggests that rational choice and family systems approaches are complementary explanations for intergenerational exchange for families in developing nations.

What differentiates the mutual aid model from the corporate model is the relationship between the transfers themselves. In the mutual aid model, transfers are mutually reinforcing but not necessarily mutually enabling--that is, having received a transfer induces reciprocation, but does not necessarily enhance the ability of the other party to reciprocate. In contrast, the corporate model proposes that transfers enhance the ability of the receiver to provide transfers in return. Sun (2002) blends corporate and mutual aid frameworks into one systemic model "which treats family as a closely related network that cares for the well-being of all family members and seeks optimal distribution of resources within the family network." We also adopt this approach because of the difficulty in empirically differentiating these two models of exchange.

While our focus in this investigation is on corporate forms of intergenerational transfers, three other perspectives on transfer motivations have relevance in the current investigation and will be mentioned briefly: solidarity, power, and altruism

Studies of intergenerational transfers based on affective forms of solidarity are common in the social sciences (Bengtson and Roberts; Silverstein et. al. 2002; Whitbeck, Simons, & Conger, 1991), but are rare in Asian nations where normative structures are thought to play a more prominent role. Studies showing that higher income elderly persons attract more emotional support from their children tend to rely on the explanation that the absence of economic dependence improves the quality of the relationship and, thus, increases the willingness of children to provide such support (Chow, 1993; Ng, Phillips, & Lee 2002).

Altruistic motivations are attributed to those making transfers based on the level of economic, social and health needs of the transfer recipient. Lee and Xiao (1998), for instance, find that financial transfers to older parents in rural China are driven by low income and poor

health, supporting a model of altruism. The self-interest model—one that receives little support in the literature--posits that support will tend to flow to those who have the most resources because such transfers will be able to attract potentially greater amounts of reciprocated transfers.

The power model maintains that older parents maximize leverage over their children in societies where the elderly tend to have control over access to valued societal resources of jobs, equity, and land. Implicit in this model is that those who control land and business assets are in a position to exact resources from others who are fearful of losing inherited wealth (Cox, 1987; Bernheim, Shleifer, and Summers 1985). The strong obligation to provide support to elders in rural areas is thought to derive from the power that land ownership confers on the elderly, (Stark, 1995, Nason, 1981; Nydegger, 1983; Salamon & Lockhart, 1980; Tsuya & Martin, 1992). In Northern Thailand a study found that the more land an older person owned the greater the likelihood of their children following traditional patterns of caring (Caffrey, 1992), while several studies of rural southern communities in the U.S. found that elderly parents placed obligations on their children for support in exchange for allowing them to settle on their land (Groger, 1992; Lozier & Althouse, 1974).

Resource transfers to grandchildren in the Chinese family typically follow traditional gender patterns that reflect a strong patrilineal basis to the family. Grandchildren tend to live closer to their paternal grandparents than to their maternal grandparents in Chinese families, and tend to receive more surrogate care from the paternal side as well (Chen, Short, and Entwisle, 2000). However, Yang (1996) found that maternal, but not paternal, grandparents received greater monetary support from children when they engaged in child-care activities suggesting that

care through the paternal line, though more normative, may be based less on compensatory principles.

Geographic distance between parents and children plays a role in determining the availability of in-person forms of support. Frequency of delivering personal assistance declines with increasing geographic separation between older parents and adult children in China and elsewhere (Bian, Logan, and Bian, 1998; Joseph, 1998; Litwak and Kulis 19xx; Ng, Phillips, & Lee 2002). However, the odds that monetary aid is provided to older parents increases with greater geographic distance from children, suggesting the use of remittances, while the odds of instrumental services predictably decreased (Sun, 2002). In another study, financial transfers to parents in Taiwan were greater from children who moved from rural to urban areas, again consistent with the remittance hypothesis (Lee, Parish & Willis, 1994). Similar findings were found among Philippinos (Domingo and Asis (1995). Where money may serve as a valued transfer resource from adult children who live far from their parents, service or labor contributions may serve as resources from children who live close to their parents.

Finally, we note that most studies of grandparents in Asian nations have focused on those who live with their grandchildren (e.g.,, Logan, & Bian, 1999, Milagros et. al., 1995, Riley 1994; Knodel, Saengtienchai, & Sittitrai (1995). However, Chen, Short, and Entwisle (2000) find that among rural mothers of children less than six years old only 3% lived with their own parents (the maternal grandparents) and 24% lived with their parents-in-law (the parental grandparents), demonstrating that the large majority of grandparents live apart from their grandchildren. Even when grandparents live with their grandchildren, the parental generation may live independently of the pair. Findings by Agree, Biddlecom, Chang, and Perez (2002) of older adults in Taiwan

and the Philippines suggest that care for grandchildren in the grandparent's household may be a benefit provided to their more distant adult children. We suggest that focusing only on grandparents who live with their adult children over-emphasizes the importance of intra-household exchanges and underestimates the degree of their involvement in child-care activities, especially in geographic areas characterized by high levels of out-migration. In addition, the degree of child-care provided by grandparents is rarely measured directly in studies of Chinese families, and is usually inferred based on knowledge of multigenerational coresidence.

Hypotheses. Drawing from our previous discussion and theoretical overview, we propose four general hypotheses that are informed by corporate/mutual aid models of intergenerational relations in the older Chinese family:

H1: Under the principle of reciprocity, we predict a *quid pro quo* between the amount of child-care provided by grandparents and the level of support received from their adult children. We hypothesize that grandparents who provide more care for their grandchildren will tend to receive greater amounts of monetary support, productive labor, and instrumental services from their adult children.

H2: Under the principle of corporate dynamics, we hypothesize that the correspondence between the amount of child-care provided by grandparents and the level of support received from their adult children will be conditional on the geographic distance between grandparents and their adult children. In deriving our hypotheses we make the following assumptions that larger geographic distance of adult children from older parents in the home village implies labor market migration of children, and that the contribution of labor by adult children to the family

economy, and the provision of instrumental services to older parents is optimized by proximity to the grandparent. Therefore, we predict the following:

(a) The marginal rate of income transfers returned for every unit of child-care provided by grandparents will be greater as geographic distance from adult children increases, and

(b) The marginal rate of labor and service transfers returned for every unit of child care provided by grandparents will be greater as geographic distance from adult children deceases.

H3: Given the traditional norm that favors sons with regard to social and economic responsibility for aged parents, as well as the strong patrilineal basis of Chinese families, we predict that child care provided to an adult son's children will be more strongly reciprocated in labor and monetary transfers than child care provided to an adult daughter's children. However, given the gendered division of labor in the Chinese family, we predict that child-care provided to by maternal grandparents (to an adult daughter's children) will be more strongly reciprocated in instrumental services than will child-care provided by paternal grandparents (to an adult son's children).

METHOD

Sample. Data for this investigation derived from the Study of Older Adults in Anhui Province, China, a region chosen specifically for its relatively high density of older adults and high levels of out-migration of working age adults. Between 1995 and 2000, Anhui Province had the third highest rate of out-migration among all provinces in China, and a higher than average rate of labor-related migration (Jinhong 1994). Data were collected from a sample of adults age 60 and over living in rural townships within Chaohu, a city of 141,000 people located on the north bank of Yangtze river in the central part of Anhui Province. This poor, rural area of the

province is generally know for its high rates of migration to the cities of Hefei, Nanjing, and Shanghai.

The survey was conducted in April 2001 by the Population Research Institute of Xi'an Jiaotong University, in conjunction with the University of Southern California. A standard back-translation method was used to insure the accuracy of the translation of the questionnaire into Mandarin, and a pilot test was performed to test the adequacy of translated questions before fielding the survey. The survey included assessments of family relations, physical health status, and psychological well-being.

The sample was identified using a stratified multistage method to randomly select 1,800 potential respondents. First, 12 rural townships were randomly selected from all 126 townships in Chaohu. Second, 6 administrative villages were randomly selected in each township. Third, within each selected village, all people aged 60 and older were stratified to form two sampling frames based on age: (1) those aged 60-74, and (2) those 75 and above. Within each age group, samples were generated such that 15 people 60-74, and 10 people 75 and older were randomly selected. To guarantee that only one older person per household was interviewed, the following two measures were adopted in the sample selection procedure. If household partners were selected for each of the two age groups, then the younger partner was dropped, and a substitute respondent was selected randomly as a replacement for him/her. If household partners were both selected for the same age group, then the partner chosen second was dropped, and a substitute respondent was randomly selected as a replacement.

Of 1,800 potential respondents identified, 1,698 completed the survey, yielding a response rate of 95.3%. The completed sample included 829 men (48.8%)and 869 women

(51.2%). In terms of age, 61.2% were 65-74 years old and 38.8% were 75 years and older. Since the focus of this investigation is on grandparents of dependent grandchildren, we restrict our working sample to the 1421 grandparents who had at least one grandchild who was 16 years of age or younger at the time of the survey. Since our interest is in the exchange dynamics between older grandparents and individual adult children, we constructed an analytic sample consisting of 4,289 grandparent-adult child lineages, out of a total of 6620 possible lineages, within which there was at least one grandchild under 16 years of age. We omitted 125 (1.9%) lineages from our analysis as a result of the grandparent's uncertainty about the age of the youngest grandchild in the set.

Dependent variables. The outcome variables of interest comprised three major types of resources that adult children provide to their aging parents: monetary support, productive labor, and instrumental support.

Monetary support was measured by asking grandparents whether each of their adult children 16 years of age and older provided them with money, food, or gifts in the last year. If yes, grandparents were asked to estimate the value of those transfers, using eight ordered categories starting at 50 RMB (approximately six dollars). A variable was constructed ranging from 0 (receives no money, food, or gifts) to 8 (receives more than 10,000 RMB).

Economically productive labor was measured only for those parents who owned a farm or business by asking them whether each of their children 16 years of age and older worked for the family farm or business over the last year. For those children who contributed such labor, parents were asked how much time each child contributed labor to the family farm or business. A composite variable ranging from 0-4 was constructed with the following response options in

terms of the proportion of time that such labor is provided: 0="none", 1= "less than half", 2= "about half", 3= "more than half", and 4= "almost all".

Instrumental support is measured by how often each child provided support with activities of daily living. Respondents were asked whether over the past year they received help in two areas: (1) household tasks, such as cleaning the house and washing clothes, and (2) personal care tasks such as taking a bath or dressing. If they received help, they were asked to name the person or persons who provided it. If a child was mentioned as a provider then a follow-up question asked how often support was provided. For each adult child response options were coded in terms of the following frequencies: 0="none", 1="seldom", 2="several times a month", 3="at least once per week", and 4="every day". An additive scale is constructed from the two variables representing frequency of household support and frequency of personal care (r =.66), resulting in a scale ranging from 0-8.

Independent variables. Predictor variables were of two general types: (1) variables at the grandparent-level of analysis, and (2) variables at the adult child-level of analysis.

Grandparent-level. Variables describing grandparents included gender (0= "male", 1= "female"); age in years; marital status (0= "widowed, divorced, separated", 1= "married, living with spouse"); education (0= "no formal education", 1= "at least some formal education); occupation or previous occupation (0= "non-agricultural', 1= "agricultural"). Household income was measured as the logged total yearly household income (earnings, pensions, and other contributions of household members.) Sixteen respondents with missing data were assigned to the mean logged value of income (about 98 RMB). Household size was considered as the total

number of people currently residing in the household, and number of children was considered as the total number of living children.

Two health variables were constructed reflecting functional limitations and cognitive health. Functional health was measured as the sum of items reflecting the ability to perform in three areas: activities of daily living, instrumental activities of daily living, and activities requiring physical strength, mobility, and flexibility. Activities of daily living reflected the ability to bathe; put on and take off clothes; walk around the room; use the toilet; and eat a meal. Instrumental activities reflect that ability to prepare meals, shop, take the bus or train, do housework, and manage money. Tasks requiring strength, mobility, and flexibility included the ability to lift a 10 kg. bag of rice; climb one flight stairs; stoop, crouch, or kneel;, and walk 100 meters. Respondents indicated the level of difficulty performing each task: (1) no difficulty, (2) some difficulty (3) cannot do it without help. A summed scale was made from the fourteen items (alpha= .95) ranging from 14 (no difficulty) to 42 (unable to perform all tasks independently).

Cognitive ability was measured with three performance tests designed to assess short-term and working memory (adapted from Herzog et. al. 1998). Short-term memory was assessed by the ability to recollect five words thirty seconds after they were read, and ranges from 0-5 words recalled. Working memory was assessed by the number of times that the respondent, starting at twenty, could successively subtract three. Items were reversed so that higher scores indicated greater cognitive impairment. We use principle components analysis to create a standardized factor score denoting cognitive impairment that captures 71% of the item variance.

Child-level variables. Variables describing adult children the included the following demographic characteristics: gender (0= "son", 1="daughter") age in years; marital status (0= "widowed, divorced, separated", 1= "married, living with spouse"); education (two dummy variables, denoting whether or not the child attended only primary school (=1), or attended up to middle school (=1), with the reference group consisting of those who did not attend any formal schooling). Distance between from each adult child is measured on a scale of 0-6, where 0= "same household", 1= "same village", 2= "same township", 3= "same county", 4= "same city", 5="same province", and 6= "outside the province". Four children who lived abroad were assigned to the farthest distance category.

Strength of emotional closeness between older respondents and each of their adult children was operationalized by a composite variable constructed from three questions asking grandparents to evaluate their relationship with each of their adult children along the following dimensions: "feeling close to child" (1= "not close"; 2= "somewhat close", 3= "very close"); "being on good terms with child" (1= "not at all", 2= "somewhat", 3= "very much"); and "child listens to your difficulties and troubles" (1="not at all", 2="sometimes, 3="most of the time". These three items (alpha= .86) were added to form a scale ranging from 3-9.

The contribution of grandparents toward the care of their grandchildren is measured as the frequency with which they provided child-care for the offspring of each adult child during the past year. For the sake of simplicity, grandchildren were treated in sets, that is, nested within each adult child who parented them. Thus, a single value was ascertained for child-care provided to each set of grandchildren where at least one grandchild was under the age of 16. This variable ranged from 0-6, with 0= "not at all", 1= "seldom", 2="once per month", 3= "several times per

month", 4= "at least once per week", 5= "every day, but not for the entire day", and 6= "every day, for the entire day". Finally, two variables describe characteristics of each lineal set of grandchildren, including number of grandchildren in each set, and age of the youngest grandchild in each set.

To test the moderating effects of geographic distance and gender of child on the strength of the association between caring for grandchildren and receiving support from adult children, we constructed two interaction terms: (1) the product of distance from adult child and frequency with which the grandparent provided child care, and (2) the product of gender of adult child and frequency with which the grandparent provided child care. We also performed post-hoc tests of interactions using dummy variables for distance to detect the presence of non-linear interaction patterns. We report more parsimonious models that interact continuous variables and add a dummy variable to capture variance related to coresiding with a grandchild.

Multivariate estimation. Our interest in exchanges between parents and individual children necessitated that a data file be created in which characteristics of grandparents are linked to characteristics of each of their adult children. This dyadic data structure comprised non-independent units of analysis in which each grandparent is represented as many times as the number of children they have—in other words, grandparents form family clusters within which their children are nested. In such a nested data structure, characteristics of grandparents are, by design, constant within each family cluster, but characteristics of adult children may vary within each cluster. Such a data structure calls for a design that is able to correctly specify regression coefficients where variation may exist both between and within family clusters. Thus, we used random effects modeling, a procedure suited to unbalanced hierarchical or nested the data, with

grandparents as the grouping variable (Stata, 2001). Formally, the random effects model in our application took the following form:

$$y_{it} = a + Bx_{it} + v_i + e_{it}, \qquad (1)$$

where y_{it} represents a transfer to each of I grandparents from up to T adult children, x stands for a predictor variable and B is its effects, v_i is the grandparent-specific residual that differs between grandparents but is constant for any one grandparent, and e_{it} is the remaining residual for each observation. Note that v_i represents the average deviation of each grandparent from all grandparents. For example a grandparent who receives high levels of transfers from their adult children would consistently receive higher returns across all their children, leading to a positive v_i. From equation (1), two additional equations follow, representing the process at the level of the grandparent (between clusters) (2) and at the level of grandchildren (within clusters):

$$\bar{y}_i = a + B\bar{x}_t + v_i + \bar{e}_t, \qquad (2)$$

$$(y_{it} - \bar{y}_i) = a + B(x_{it} - \bar{x}_t) + (e_{it} - \bar{e}_t) \qquad (3)$$

The estimation of B in the final random effects model is the weighted average of the estimates produced by the between and within estimators (see Stata, 1992). For variables that do not vary within clusters (i.e., fixed characteristics of grandparents such as gender) then equation (2), the between-estimator, is used. For variables that do not vary on average between clusters (i.e, the random effect v_i is not an important part of the model), then siblings do not share a propensity in their behavior based on their common family membership and the pooled estimator is sufficient.

Further, there were relatively large numbers of grandparents who do not receive transfers from their adult children, producing non-normal distributions in the dependent variables, with values clustered at the limiting value of zero. These cases were considered left-censored

observations, as their values were considered to represent a qualitatively distinct position on the quantitative scale than those whose values were above the limit. Therefore, we used Tobit analysis (Tobin, 1958, McDonald and Moffitt 1980) that estimates a single coefficient for each independent variable predicting two synthesized outcomes: the probability of making a transition from receiving no transfers to receiving some transfers, and the increase in the value or amount of transfers given that the limit value of 'no transfers' was passed. Such a Tobit model estimated within the context of a random effects procedure produces coefficients that are robust both to truncation in the distribution of transfer variables, as well as to the presence of grouping effects due the nesting of observations within common families.

Random-effects models include a coefficient (*p)* that summarizes the percent of the total variance attributable to the group component of the model. Similar to the intra-class correlation, this statistic is informative concerning the degree to which adult children of the same parents share more with each other in their transfer behaviors than they do with adult children of other parents—the raison detre for random-effects estimation.

RESULTS

We first present frequency distributions of variables at both the grandparent and parent levels of analysis. The characteristics of 1421 grandparents with grandchildren age 16 or less (and for whom child-care information is known) are shown in Table 1. The sample is evenly divided between grandmothers and grandfathers. Almost half the sample is (52%) consists of the young-old (under 70 years of age), about one-third (33%) are 75 and older. Three out of five respondents are currently married. Almost one-fifth (19%) live alone, but 31% live in households that consist of four or more members. Family size is large compared to younger

cohorts of Chinese adults, with 69% having four or more children, and relatively few (12%) with one or two children. In terms of socio-economic status, education level of these grandparents is quite low with only 22% having had any formal education, the large majority of which ended their schooling at the grade-school level. The vast majority (91%) of grandparents are, or have been, employed in the agricultural sector of the economy, and more than half (55%) currently own a farm or business.

Characteristics of 4,289 adult children--each of whom has at least one child 16 years of age and younger-- are reported in Table 2. Slightly more than half (53%) were daughters, 79% were under the age of 40, 82%were married, and more than one-third (36%) had at least a middle school education. Grandparents lived near but not necessarily with their children. In terms of geographic distance from their parents, only 6% of adult children lived with their parents. This is not wholly surprising given that the unit of analysis in this context is the adult child (turned the other way, 17% of parents live with at least one adult child), and the possibility that labor-force migration has reduced coresidence. While only few adult children lived in the same household as their parents, more than one-quarter (28%) lived in the same village–a distance still close enough to engage in daily exchanges. Most striking is that 29% of children lived beyond the boundaries of Anhui province, underscoring the magnitude of out-migration of younger adults in this region of China and its potential for affecting intergenerational exchanges. In general, the grandparents tended to be emotionally close to their adult children. Very close relationships were maintained with about one-third (34%) of their adult children, and weak relations were reported with only 7% of these children.

We discuss characteristics grandchildren aggregated by sets within each lineage of the grandparent respondent. The large majority (84%) of these grandchild sets consisted of one or two grandchildren under the age of 16, reflecting the reduction in fertility characteristic of more recent birth cohorts in China. These grandchildren tended not to coreside with their grandparents, with only 15% of sets containing a child who lived with the grandparent respondent. Many grandchildren were young, as 62% of family sets contained a grandchild who was under 10 years of age. Grandparents provided at least some childcare to slightly more than one-third (35%) of all possible sets of grandchildren, and provided daily help on a full- or part-time basis to almost one in five (19%) of those family sets.

The distribution of each dependent variable--representing a particular resource transfer to grandparents by their adult children--is shown in Table 3. The large majority adult children provide money, material goods, or food to their parents, with 87% having done so in the past year. This reflects a strong cultural demand on children, but is also the product of the absence of public alternatives for old age support. Much of the financial support appears to be of low to moderate value reflecting the generally under-developed economy in this part of China. Nevertheless, financial contributions are likely to represent significant proportions of the income of these recipients given that 30% of the older sample has no income beyond the support from their adult children. In terms of children's contributions to farm or business labor, almost 2 in 5 adult children worked for a family farm or business headed by the older grandparent. A minority of adult children, only 16%, provided housework or personal care to their parents. That few children overall provide instrumental services may be due to lack of need on the part of the

parent, the relatively large degree of residential independence between the generations in this region, or the delegation of instrumental care responsibility to select members in each family.

Multivariate Models. Random effect Tobit equations predicting each of the three transfers to grandparents from their adult children are shown in the next sequence of tables. Equations are built hierarchically, with grandparent-level variables included first, then child-level main effect variables added, and finally each of the two interactions to be tested. With the addition of child-level variables, it becomes possible to detect whether variation across child-level characteristics is related to variation in each child-level outcome denoting resource transfers to parents. While we denote variables that are marginally significant (<.10), these are only discussed in the case of interactions, where allowances are made for the lower power associated with product terms, especially those consisting of continuous variables (McClelland & Judd, 1993).

In Table 4 we show parameter estimates for Tobit equations predicting the receipt of monetary support from adult children. The first equation shows the effects of grandparent characteristics only. Agricultural workers receive greater remittances from their adult children than non-agricultural workers. However, grandparents who own a business or farm receive lower remittances than those who are not owners. In addition, younger grandparents and those with more cognitive difficulties also tend to receive greater remittances.

The next equation in Table 4 adds child characteristics to the model. Daughters, as well as married and more educated children provide greater remittances than their counterparts. Age of grandparent ceases to be significant when child characteristics are controlled indicating that younger grandparents received more transfers because such grandparents tend to have children

who have characteristics associated with providing monetary. Grandparents tend to receive greater remittances from adult children with whom they are emotionally closer, as well from those who live farther away. Turning to variables that characterize grandchildren in each parental set, the results show that grandparents tend more to receive remittances from adult children who have fewer children of their own. In addition, living with a grandchild, but not the amount of childcare provided to grandchildren, increased remittances received from that grandchild's parent.

The final two equations in Table 4 introduce two interaction terms of interest. Equation #3 shows the interaction between the amount of childcare provided to grandchildren and geographic distance from the adult children who are parents of those grandchildren. This interaction term is statistically significant and positive, indicating that remittances tend to increase with greater childcare more rapidly as the distance between grandparent and parent gets progressively larger. In other words, intergenerational reciprocity is proportionally stronger the farther parents live from the grandparents. The final equations shows the interaction between child-care and gender of the parent. The coefficient is significant ($p<.10$) and negative indicating that reciprocity in the exchange of child-care for remittances is weaker when parents are sons of the grandparent than when they are daughters.

The Tobit equations predicting the receipt of farm/business labor from adult children are shown in Table 5 (restricted to owners only). The first model shows that grandparents with more adults in their households, but fewer children received greater amounts of economically productive labor. Being in poorer health and unmarried also increased the amount of labor received.

The second model in Table 5 shows that grandparents tend to receive more labor from adult children who are not married and who have no education (relative to middle school or higher). More labor is received from children toward whom the grandparents feel emotionally closer, and who live geographically closer. In terms of grandchild characteristics, both living with a grandchild and the amount of child-care provided by grandparents are associated with larger amounts of labor received from adult children.

The third equation adds the interaction term between care for grandchildren and geographic distance. The coefficient is significant (<.10) and negative demonstrating that in terms of labor received, grandparents are more rewarded for their child-care when they live closer to their adult children. The fourth equation introduces an interaction term between child-care and gender of adult child. This coefficient is statistically significant ($p<.10$) and positive, indicating that compared to daughters, sons more strongly compensate their parents' childcare by contributing labor to the family farm or business.

Finally, in Table 6 we show estimates predicting the receipt of instrumental services from adult children. The first equation shows that grandparents in greater need—unmarried, older grandparents, more physically and cognitively impaired-- received more instrumental support from adult children. Socioeconomic factors also played a role, with grandparents with higher income, and who own a business or farm, and worked in non-agricultural sector tending to receive more instrumental services from children. Having more adults in the household enhanced the amount of support from children, some of who may be household members. However, those with fewer children received more instrumental support from children, the

average child in smaller families has fewer siblings with whom to share parent-care responsibilities.

The effects of children's characteristics, shown in Model 2, reveal that daughters are more likely than sons to provide instrumental assistance. Emotional closeness and geographic proximity to the adult child increased instrumental support received. Grandparents also received more instrumental support from adult children who had older children of their own, possibly because they had fewer competing obligations. Living with a grandchild and taking care of grandchildren were also positively related to the receipt of these services. Finally, the last two models that introduce interaction terms show that neither is statistically significant.

DISCUSSION

In this investigation we investigated intergenerational transfers among older grandparents living in a rural region of China. We focused primarily on the childcare efforts of grandparents as a central family resource that integrates family members within the entity of a corporate family system. Our findings generally portray the rural Chinese family as one bound by economic, labor, and service exchanges between generations. Reciprocation for childcare by economic and labor transfers by children was conditional on geographic distance. Where reciprocation of money and food for childcare was stronger between parents and children who lived farther away from each other, reciprocation of labor for childcare was stronger between parents and children who lived closer to each other. Indeed, there was no main effect of childcare on economic transfers, suggesting that money-for-service hypothesis holds most strongly for more distant children who are sending remittances over longer distances. However, living with a grandchild directly increased the amount of all three forms of support grandparents received from their

children. Independently of how much childcare is delivered by grandparents, sharing a household with a grandchild is a qualitatively unique arrangement where housing represents a resource of the elderly that is exchanged for economic, labor, and instrumental assistance from adult children.

Our finding that the amount of childcare provided is positively related to receiving farm/business labor from children is the product of a family-based economy where primarily local children tend to the family farm or business while their parents tend to their young children. Although local and distant children provide different types of resources in exchange for childcare, each reflects the same type of intergenerational interdependence in which childcare by grandparents functions as a family resource that enables adult children to make transfers to their parents in return. Viewed in this light, the observed reciprocity is not only an interpersonal quid-pro-quo but also a mutually reinforcing exchange that promotes the well-being of the family as a functional unit, the essential characteristic of the corporate family model

We also found that childcare was directly reciprocated with greater instrumental help from adult children. In doing this particular analysis, we were sensitive to the possibility that grandparents in poorer health were both less able to provide childcare and more likely to receive instrumental support. In fact, the zero-order coefficient between child-care and instrumental services was negative. However, the coefficient changed to a positive direction when functional and cognitive health were controlled, confirming our expectation that health status operates as a suppressor of the reciprocity we had hypothesized to find. Thus, statically removing the spurious effect of health allowed the exchange of childcare for instrumental services to be observed.

We also investigated how the gender of adult children influences resource allocation in the family. We found, quite unexpectedly, that grandparents received more monetary support from their daughters than from their sons. Further analysis revealed that sons provide economic assistance less frequently than daughters, but when they do it is in greater amounts. In addition, grandparents received particularly low levels of economic assistance from their unmarried sons, who were most likely to contribute labor. In this sample, patrilineal favoritism in intergenerational resource allocation is more complex that previously hypothesized, with more frequent, but relatively smaller economic contributions provided by daughters—a pattern that may be related to their over-representation in the low wage the service economy.

In support of a patrilineal bias in the downward transfer of intergenerational resources, we found that grandparents provided childcare for 47% of their sons' children compared to only 20% of their daughters' children. However, the exchange of economic support for childcare was found to be stronger with daughters than with sons, a finding similar to that reported by Yang (1996). It is likely that that traditional norms more strongly obligate sons to financially support their parents, while in the absence of strong normative pressures, the dynamics of exchange are important for reinforcing such support from daughters. With regard to instrumental services, we observed that grandparents receive more such support from daughters than from sons, .a striking division of labor in light of the low rates of childcare services received by daughters. This important contribution made by daughters to their aging parents is an overlooked resource in many studies of intergenerational exchange that tend to focus primarily at economic transfers.

We noted earlier that theories concerning transfer motivations in the family are not mutually exclusive. The power hypothesis of land and business ownership was demonstrated

with greater instrumental services being provided to farm and business owners than to non-owners. This may be viewed as the product of leveraging heritable resources of the parent. However, the inverse was found with respect to economic support, with farm/business owners receiving less monetary transfers than non-owners. Farm and business owners may have less direct economic need than non-owners, and may presumably garner more support from children in the form of economically productive labor.

The success of investing in the human capital of children as a long-term strategy to insure old age security was confirmed. More highly educated children tended to provide greater economic support to their parents, but less labor to their parents' farm or business. While greater education optimized the potential of children to contribute financially to their parents, it also depressed their utility as laborers in the family farm or business. Thus, human capital investment in children functions as an aspect of the corporate family with respect to financial transfers, by increasing children's value in work roles outside the family.

We observed forms of altruism on the part of adult children. Older parents with the greater health need tended to attract more support from their children. Poorer physical health was associated with receiving more labor and instrumental support, and greater cognitive difficulty was associated with receiving greater economic and instrumental assistance. Economic need as measured by income generated less assistance from children than anticipated. Though lower income parents received more monetary and instrumental assistance from their adult children, these effects were close to, but not reach, statistical significance. Agricultural workers tended to receive more monetary support than those working in other economic sectors, a response by children to unstable income flows in this line of work. Greater economic response to

parents who do not own businesses or farms may be viewed as altruism toward those with fewer tangible assets at their disposal. Finally, the contribution of intergenerational solidarity is seen in the positive impact that emotional affinity between parents and children has on the magnitude of all three forms of transfers to parents.

CONCLUSION

In spite of the growing literature about the importance of custodial grandparents in the developed world, the importance of grandparents has been little studied in developing nations that are undergoing rapid social and economic change. Our analyses support a model of mutually reinforcing intergenerational resource transfers in rural Chinese families that is consistent with a corporate family form of systemic adaptation. A model of exchange that reflects reciprocity as well as interdependence may best characterize intergenerational exchanges under conditions of scarcity and social turbulence. When exchanges simultaneously satisfy common family goals, they are better viewed as mutually determined than as purely guided by the *quid-pro-quo* of serial reciprocity. However, the exact nature of reciprocity is difficult to judge using our cross-sectional data because it is possible that grandparent-provided childcare is as much a reward for the contributions of their adult children, as support from adult children is a reward for grandparent-provided childcare.

The family, most notably adult children, have traditionally served as primary sources of support for the Chinese elderly, especially those living in rural China (Shi, 1993; Xu & Yuan, 1997; Yuan, 1987). What is the future of the corporate family in light of reductions in family size of the last generation? Reduced fertility related to the one-child policy has resulted in the so-called, 4-2-1 family structure of grandparents, parents, grandchildren. Such a family provides

adult children and grandchildren with abundant opportunities for grandparent services, but may put excessive pressure on younger generations for providing help and money to their parents in return.

The process of economic development and modernization has cast doubt on the continued viability of traditional family arrangements for the elderly of China. Will traditional norms of filial support for older relatives weaken as members of younger generations have access to better paying jobs relations and adopt more "Western" attitudes toward their elder-care responsibilities)? Will the resources of older parents become less important to a growing middle class of self-sufficient children? We suggest that, at least in the short-term, grandparents are crucial to the economic competitiveness of the nuclear family of their adult children. This notion lead to the intriguing possibility that assistance from grandparents *enables* social change by granting adult children the opportunity to take jobs at better pay in far-flung locations, with clear benefits to the elderly and the family as a whole.

Table 1. Characteristics of grandparents (N=1421)

	N	%
Gender		
Male	713	50.2
Female	708	49.8
Age		
60-64	376	26.5
65-69	356	25.1
70- 74	224	15.8
75-79	363	25.5
80+	102	7.2
Marital status		
Not married	581	40.9
Married	840	59.1
Total household size		
1	269	18.9
2	498	35.0
3	208	14.6
4+	446	31.4
Number of children		
1	52	3.7
2	116	8.2
3	269	18.9
4	392	27.6
5	319	22.4
6+	273	19.2
Education		
No formal education	1105	77.8
At least some formal education	316	22.2
Occupation		
Non-agricultural	129	9.1
Agricultural	1292	90.9

	N	%
Owns farm or business		
Does not own	639	45.0
Owns	782	55.0
Household income (in RMB)		
0	428	30.1
<500	255	17.9
500-999	223	15.7
1000-1999	240	16.9
2000+	259	18.2
Missing	16	1.1

Table 2. Characteristics of adult children and grandchildren sets (N=4,289)

	N	%
Gender of adult child		
Male	2279	53.1
Female	2010	46.9
Age of adult child		
21-29	358	8.3
30-34	1295	30.2
35-39	1728	40.3
40+	794	18.5
Missing	116	2.7
Marital status of adult child		
Not married	768	17.9
Married	3518	82.0
Missing	3	.1
Education of adult child		
No formal education	1338	31.2
Primary school	1419	33.1
Middle school and higher	1527	35.6
Missing	5	.1
Geographic proximity to adult child		
Same household	240	5.6
Same village	1194	27.8
Same township	628	14.6
Same county	583	13.6
Same city	61	1.4
Same province	292	6.8
Outside province	1240	28.9
Missing	51	1.2
Emotional closeness to adult child		
Low (1-3)	301	7.0
Moderate (4-6)	2,249	56.6

	N	%
High (7)	1463	34.1
Missing	96	2.2
Number of grandchildren in set under 16		
1	1,686	39.3
2	1927	44.9
3	523	12.2
4+	141	3.3
Missing	12	.3
At least one grandchild in set lives with grandparent		
No	3,649	85.1
Yes	640	14.9
Age of youngest grandchild in set		
0-5	971	22.6
6-10	1,698	39.6
11-13	981	22.9
14-16	533	12.4
Less than 16 but does not know exact age	106	2.5
Frequency grandparent cares for grandchildren in set		
Not at all	2,802	65.3
Seldom	361	8.4
Once per month	50	1.2
Several times per month	120	2.8
Once per week	152	3.5
Every day, but not all day	513	12.0
Every day, all day	291	6.8

Table 3. Resources received by grandparents from their adult children

	N	%
Money, food, gifts (in RMB)		
None	496	12.8
Less than 50	579	14.9
50-99	634	16.3
100-199	797	20.6
200-499	954	24.6
500-999	269	6.9
1,000+	149	3.9
Total	3,878	100.0
Labor contributions to family farm or business		
None	1,479	61.0
Less than half	660	27.2
About half	131	5.4
More than half	104	4.3
Almost all	50	2.1
Total	2,424	100.0
Instrumental support (household and personal care)		
0 (None)	3610	84.2
1-2	381	8.9
3-4	158	3.7
5-6	80	1.9
7-8 (Everyday)	60	1.4
Total	4,289	100.0

Table 4. Random effects Tobit models predicting transfers of money and goods from adult children (observations=3,427; respondents=1,182)

	Model 1	Model 2	Model 3	Model 4
Grandparent-level variables				
Grandmother (ref=grandfather)	.163+	.058	.059	.058
Married (ref=not married)	.010	-.017	-.029	-.018
Some formal education (ref=no education)	.182+	.155	.153	.154
Agricultural worker (ref=other worker)	.494**	.377*	.379*	.372*
Owns farm or business (ref=does not own)	-.472***	-.382***	-.384***	-.383***
Household income (log)	-.029+	-.029+	-.026+	-.029+
Number in household	.055+	-.012	-.005	-.013
Age of grandparent	-.020*	-.011	-.009	-.011
Functional health difficulty	-.009	-.004	-.004	-.004
Cognitive difficulty	.186***	.099*	.103*	.097*
Number of children	.024	.010	.007	.011
Adult child-level variables				
Son (ref=daughter)		-.189**	-.189**	-.140*
Married (ref=not married)		.217**	.221**	.218**
Primary school education (ref=none)		.255***	.251***	.253***
Middle school education (ref=none)		.513***	.510***	.510***
Age of adult child		.009	.009	.009
Emotional closeness to adult child		.426***	.426***	.425***
Geographic distance from adult child		.102***	.070***	.103***
Lives with a grandchild parented by adult child		.349***	.287**	.358***
Age of youngest grandchild parented by adult child		-.005	-.007	-.005
Number of grandchildren parented by adult child		-.101**	-.113**	-.110**
Provides care for grandchildren parented by adult child		-.021	-.075***	.016
Interactions				
Provides care for grandchildren * geographic distance from adult child		-----	.018***	-----
Provides care for grandchildren * adult child is son		-----	-----	-.050+
Wald chi-square	70.46***	716.90***	729.89***	720.63
Df	11	22	23	23
Rho	.357	.364	.365	.364

Note: + p <.10; * p < .05; ** p < .010; *** p < .001.

Table 5. Random effects Tobit models predicting transfers of farm/business labor from adult children (obervations=2,213; respondents=730).

	Model 1	Model 2	Model 3	Model 4
Grandparent-level variables				
Grandmother (ref=grandfather)	-.069	-.080	-.082	-.081
Married (ref=not married)	-.330*	-.111	-.096	-.101
Some formal education (ref=no education)	-.237	-.284*	-.282*	-.286*
Agricultural worker (ref=other worker)	.554	.548+	.538+	.546+
Household income (log)	-.015	-.010	-.011	-.010
Number in household	.218***	.046	.039	.047
Age of grandparent	.022+	.011	.010	.011
Functional health difficulty	.036*	.027*	.027*	.027*
Cognitive difficulty	-.013	-.011	-.015	-.010
Number of children	-.107*	-.074+	-.069+	-.077+
Adult child-level variables				
Son (ref=daughter)		.108	.107	.009
Married (ref=not married)		-.351***	-.353***	-.351***
Primary school education (ref=none)		-.193+	-.189+	-.190+
Middle school education (ref=none)		-.362**	-.359**	-.362**
Age of adult child		-.002	-.002	-.002
Emotional closeness to adult child		.228***	.227***	.229***
Geographic distance from adult child		-.385***	-.354***	-.387***
Lives with a grandchild parented by adult child		.574***	.624***	.547***
Age of youngest grandchild parented by adult child		.005	.007	.0065
Number of grandchildren parented by adult child		-.073	-.064	-.0743
Provides care for grandchildren parented by adult child		.083***	.118***	.031
Interactions				
Provides care for grandchildren * geographic distance from adult child		-----	.013+	-----
Provides care for grandchildren * adult child is son		-----	-----	.077+
Wald chi-square	55.58***	482.07***	491.76***	484.64***
Df	10	21	22	22
Rho	.400	.410	.411	.409

Note: + p < .10; * p < .05; ** p < .001.

Table 6. Random effects Tobit models predicting transfers of instrumental support from adult children (observations=3,808; respondents=1283).

	Model 1	Model 2	Model 3	Model 4
Grandparent-level variables				
Grandmother (ref=grandfather)	.409	.230	.231	.230
Married (ref=not married)	-1.226***	-.996***	-.973***	-.994***
Some formal education (ref=no education)	.138	.024	.025	.024
Agricultural worker (ref=other worker)	-.950*	-.722+	-.730+	-.722+
Owns farm or business (ref=does not own)	.931**	1.079***	1.090***	1.080***
Household income (log)	-.044	-.086+	-.089+	-.086+
Number in household	.215**	-.210*	-.222*	-.210*
Age of grandparent	.060**	.044+	.042+	.044+
Functional health difficulty	.156***	.175***	.175***	.175***
Cognitive difficulty	.380**	.359**	.355**	.360**
Number of children	-.584***	-.501***	-.499***	-.502***
Adult child-level variables				
Son (ref=daughter)		-2.404***	-2.376***	-2.451***
Married (ref=not married)		-.046	-.061	-.049
Primary school education (ref=none)		.282	.265	.286
Middle school education (ref=none)		.228	.221	.231
Age of adult child		-.053	-.053	-.053
Emotional closeness to adult child		.560***	.560***	.562***
Geographic distance from adult child		-.990***	-.912***	-.991***
Lives with a grandchild parented by adult child		1.478***	1.567***	1.472***
Age of youngest grandchild parented by adult child		.085*	.089*	.085*
Number of grandchildren parented by adult child		-.133	-.118	-.135
Provides care for grandchildren parented by adult child		.235***	.310***	.213*
Interactions				
Provides care for grandchildren * geographic distance from adult child		-----	-.036	-----
Provides care for grandchildren * adult child is son		-----	-----	.034
Wald chi-square	176.29***	415.11***	418.41	414.87
Df	11	22	23	23
Rho	.011	.010	.010	.010

Note: + p < .10; * p < .05; ** p < .001.