

# Cultural evolutionary altruism: theory and evidence

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## Abstract

This paper examines the motives underlying inter vivos transfers within the family. Moving away from the altruism and exchange hypotheses, we study the endogenous altruism approach in which private transfers are rooted in a purposeful shaping of preferences within the family. Rather than relying on the demonstration effect theory where parents take care of their elders in order to elicit a similar behaviour from their children, we present instead a model of cultural transmission of altruistic values between generations in which individuals can be either altruistic or nonaltruistic with respect to their parents. The predictions of the model are empirically tested using French data that allow us to investigate time-related transfers and attention from middle-aged respondents to their elders. The empirical results are in favour of the cultural transmission of altruism, in that people who support their parents are more likely to be supported by their children. © 2002 Elsevier Science B.V. All rights reserved.

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## 1. Introduction

The literature on inter vivos transfers between generations inside the family has identified different motivations for the transfers. In a model with exogenous altruism, parents care about their children's well-being and gifts flow from the least to the most financially needy generation, independently of any present or future reciprocating help

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(Becker, 1991). In the exchange model, transfers can be viewed as a payment of money for nonmarket services from children and cash assistance can be rendered later as part of a long-term contract in order to extract a greater amount of attention (Bernheim et al., 1985; Cox, 1987). Another exchange mechanism treats transfers as forms of familial loans between egoistic individuals, where parents help their liquidity-constrained children early in the life cycle and are paid back in the future during old age (Cox, 1990; Cigno, 1993).

The altruism and exchange models yield different predictions about the effect of the recipient's income on transfers, and these testable restrictions can determine which theoretical hypothesis is consistent with the data. The amount bestowed is expected to decrease in response to the child's higher income under altruism, but it is conversely expected to rise with the child's income in the case of an exchange when the demand of attention from children is inelastic, parents having to pay a higher price to obtain the same amount of services (Cox and Rank, 1992).<sup>1</sup> However, Stark and Falk (1998) have recently stressed the inability to infer motives behind transfers from this test because the altruism and exchange hypotheses can give rise to behaviour that can be "observationally equivalent." In their model where a child's lower income may be positively correlated with an exchange transfer, gifts directly affect preferences through a recipient's empathy function.

When altruism is viewed as endogenous, intergenerational transfers are rooted in a rational and purposeful formation of preferences within the family. By shaping individual preferences, private transfers are able to generate indirect commitments between generations. Such an approach seems especially fruitful for explaining how parents who are concerned about old age support rely on the support from their children. Engers and Stern (2002), Hiedemann and Stern (1999), McGarry (1998) and Pezzin and Schone (1997, 1999) have shown how upward assistance is important because the ageing of the population and the increased number of disabled elderly will result in a rise in informal care-giving efforts by families. By studying how children take care of elders, we shed light not only on the motives for upstream transfers, but also on the mechanisms that allow the exchanges within generations (Laferrère, 1999). Parents have different strategies for instilling in their children a willingness to provide care during old age.

In a strategic bequest model, parents use the threat of disinheritance to extract a greater amount of services from children by stipulating the total amount of bequeathable wealth and applying a specific rule whereby this sum is shared in accordance with the level of care provided by each child (Bernheim et al., 1985).<sup>2</sup> Becker (1993) proposed a different explanation based on preference shaping, whereby parents inculcate in their children a sentiment of shame if the children do not comply with the parents' desired behaviour. Through this direct inculcation, children feel less guilty when they make more transfers to their elders. Cox and Stark (1996, 1998a,b) modify the mechanism to present an indirect

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<sup>1</sup> In the general case, the effect of the child's income cannot be signed under an exchange motive since it depends on the elasticities of supply and demand for services (Cox, 1987). Under altruism, offsetting a given change in both the child's and parent's income is completely neutralized by a same change in the transfer value given by the parent to the child (Altonji et al., 1997).

<sup>2</sup> In the strategic model, each child is then paid for his services immediately on the date of death following the stipulated division rule of inheritance.

process of exchange, where parents shape their children's preferences by setting an example<sup>3</sup>. Individuals care for their elders, as they would like to be cared for themselves in the future by their own children, with the children expected to replicate the observed behaviour.

As shown by the authors, this "demonstration effect" hypothesis generates testable predictions that run counter to those expected under the alternative altruism and exchange models. Many predictions are borne out by the data. Following Cox and Stark (1996) and Wolff (2001), respondents provide a greater amount of contact and visits to their parents when they themselves have young children. The number of children increases the probability that respondents make cash gifts to their elders, and households are also more likely to expect money from their children if they themselves make financial transfers to their parents (Cox and Stark, 1998a). The probability of providing time-related assistance to elders increases for women and is affected by the intra-household distribution of income: indeed, the expected benefit from the demonstration effect is greater for women who have a longer life expectancy (see Jellal and Wolff, 2000).

The demonstration effect theory is part of the endogenous preferences literature, but provides no convincing explanation why the demonstration effect works. From a theoretical viewpoint, there are at least two problems.<sup>4</sup> First, each individual is a maximizer who solves an optimization problem taking into account the effect of his or her behaviour on the future generation. However, there is one aspect which is beyond this maximization, and this is imitating the previous generation. There is a consistency problem. Each successive generation has the same incentives to undertake a demonstration effect. There is no motive for adults assisting their elders because their children are obliged to help them, in order to inculcate in their own children that parents should be helped. Second, the demonstration effect does not specify what comes from endogenous altruism and what comes from egoistic concerns, i.e. the process of acquisition of endogenous altruism is completely black-boxed. If individuals are becoming altruistic with respect to their parents through a demonstration effect, then they should help their elders without evoking a further demonstration effect to their own children.

Cultural transmission between generations may explain the correlation in the behaviour of different generations inside the family, especially attitudes towards the elders. To explain the motives for inter vivos transfers, we do not rely on the demonstration effect theory, but focus instead on a theory of cultural transmission of parental altruism. We present a model in which individuals can be of two types with respect to their parents, altruistic or egoistic, and the probability of a child being altruistic increases with the amount of care shown by his parents to their own elders. This allows us to prove why altruistic preferences survive evolutionary selection while egoistic preferences do not. The cultural transmission hypothesis generates testable predictions. Most of them are obser-

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<sup>3</sup> This approach is called the demonstration effect theory (Cox and Stark, 1996). Also presented by Bergstrom and Stark (1993) and Stark (1995, chap. 3), the model involves three generations, grandparents, parents and children, and it accounts for imitative behaviours in the expected utility maximization.

<sup>4</sup> We thank the referees for their comments and clarifications concerning the pitfalls of the demonstration effect theory.

ationally equivalent to those of irrational demonstration effect theory, but parents do not have incentives to free ride unilaterally and they provide care independently of the number of children.

We show the relevance of the cultural transmission theory of gift-giving values in explaining the motives for private upstream transfers in France. We test the theoretical predictions using a French trigenerational data set that allows us to investigate time-related transfers and attention from middle-aged respondents to their parents.

The remainder of the paper is organized as follows. The model of cultural diffusion of values is presented in Section 2. After describing the data, we present the econometric tests in Section 3 and report our empirical results, which are consistent with the cultural diffusion of altruistic values. Section 4 concludes.

## 2. A model of cultural transmission of altruism

### 2.1. *Cultural diffusion theory*

According to recent theoretical literature, cultural evolutionary processes can play an important role in the process of evolution.<sup>5</sup> Cavalli-Sforza and Feldman (1981) and Boyd and Richerson (1985) demonstrate that under a wide range of circumstances, mechanisms of cultural inheritance can overpower conventional genetic mechanisms and, thus, genetic evolution can be driven by cultural traits.

Our paper focuses on the intergenerational diffusion of altruistic feelings between the generations inside the family. Two types of transmission are taken into account in the analysis: a vertical transmission where offsprings learn from their parents and an oblique transmission where offsprings learn from some members of the parents' generation (Boyd and Richerson, 1985). Cavalli-Sforza and Feldman (1981) provide empirical evidence in favour of the vertical transmission of cultural traits and Cavalli-Sforza (1996) argues that much individual behaviour seems to have its origin in family structure, since children are exposed from the beginning of their lives to an homogenous set of cultural models within the family. According to Boyd and Richerson (1990), human behaviour represents a compromise between genetically inherited selfish impulses and more cooperative culturally acquired values.

During past years, research focusing on the endogenous formation of preferences has emerged in the economics literature. The issue of preference shaping and cultural transmission has been addressed by Becker (1993, 1996), Becker and Mulligan (1997), Bisin and Verdier (1998, 2000a,b, 2001) and Rogers (1994). Bisin and Verdier (2001) present a model where intergenerational transmission of cultural traits and in particular preferences is the result of deliberate inculcation by rational parents, who evaluate *ex ante* the well-being of their children by using their own preferences. Bisin and Verdier (2001) build on and extend the cultural anthropology and population dynamic literature (Cavalli-

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<sup>5</sup> For an economic approach of the problem of transmission and diffusion of preferences and cultural traits, see the insightful contributions of Bisin and Verdier (1998, 2001).

Sforza and Feldman, 1981; Boyd and Richerson, 1985) by providing micro-foundations for selective effects on social preferences.<sup>6</sup>

## 2.2. Preferences and parental behaviour

To study the intergenerational transmission of filial altruism, we use an overlapping generation structure following Bisin and Verdier (2001). There is a continuum of agents in each generation. Each individual lives for three periods, respectively as young, as adult and as elderly, but decisions are made only when the family member is in the middle period. Each parent has only one child, so that the population is stationary, and normalized to one. In this paper, we are concerned with the evolution of preferences for filial caregiving behaviour. Following Boyd and Richerson (1985), we denote the variants of a dichotomous character by *a* and *b*. That is, there are these two types of preferences, *a* and *b*, in the population.

In principle, the theory of natural selection on the basis of fitness may be applicable to all replicating systems, not only to genes. Recently, a new type of replicator has been proposed, defined as a unit of cultural evolution. This new replicator is named a “meme” by Dawkins (1976), who introduced this term as a unit of cultural transmission or a unit of imitation in general. Thus, memes are defined as a cognitive pattern or as rules of behaviour that can be transmitted from one individual to another one by learning as well as imitation.<sup>7</sup> Memetics can be defined as an approach for studying cultural evolution inspired by Darwinian theories of genetic evolution (Boyd and Richerson, 1985; Cavalli-Sforza and Feldman, 1981; Lumsden and Wilson, 1981). In memetic evolution, there is a selection at the level of cultural groups if we define a group as that set of individuals carrying the same meme.

We consider the following types of preferences. Agents with meme *a* are altruistic as proposed by Becker (1991). Hence, they care about their own parents and they provide upstream services and attention without any expectation of future reciprocating behaviour. Agents carrying the meme *b* are however purely selfish. The preferences emanating from the carried meme for the two agent types are represented by the following utility functions:

$$U^a = U(Y_k, L - cX^a) + \beta_k V(Y_p, A(X^a, G)) \quad (1)$$

$$U^b = U(Y_k, L - cX^b) \quad (2)$$

Each agent is characterized by an individual utility function  $U(Y_k, l^i)$ , where  $Y_k$  is the child’s level of income and  $l^i$  is the amount of leisure (a normal good). We introduce the following restrictions in the theoretical framework. First, we only deal with time-related services.<sup>8</sup> In developed countries, the importance of financial gifts made to the elderly is weak. This may be explained by the fact that parents receive pensions during their old age

<sup>6</sup> Cultural transmission mechanisms have implications that differ from those of evolutionary selection mechanisms with respect to the dynamics of the distribution of the preference traits in the population (see Bisin and Verdier, 1998, 2001).

<sup>7</sup> For a presentation of meme theory and the dynamics of memetic evolution, see Lynch (1998).

<sup>8</sup> Since there is no financial transfer, the level of income  $Y_k$  is also the child’s level of consumption.

and they may have saved through financial markets. When they grow older, parents have a strong preference for attention and filial services that have no close substitutes in the financial market (Laferrère, 1999). Second, labour supply is fixed. Let  $L$  be the amount of nonworking time for an agent; hence,  $L$  may be devoted either to leisure  $l^i$  or to the provision of upstream care  $X^i$ . However, helping one's parents is costly and we note by  $c$  the opportunity cost per unit of services, so that  $l^i = L - cX^i$ . When two generations do not share the same house, this cost may be seen as the time and money on resources devoted by the child in visiting the parental home. This cost is strongly correlated with the geographical distance between the family members.

Thus, the two agent types differ only in their preferences for parental caregiving. When the agent is selfish, he is not concerned with the level of satisfaction of his parents and  $U^b = U(Y_k, l^b)$ . When the agent is altruistic, the child's utility is an increasing function of parental well-being. Parents are egoistic and their utility depends positively on their own level of income  $Y_p$  and on the attention function  $A(X^i, G)$ . Parents may receive services either privately from their children in quantity  $X^i$  or publicly through institutional help in quantity  $G$ . We have  $\partial A/\partial X^i > 0$ ,  $\partial A/\partial G > 0$ , but the second-order derivative  $\partial^2 A/\partial X \partial G$  can be positive or negative, depending on whether the public and private types of assistance are complementary or substitutes. For convenience, we focus on a separable utility function for the child, so that  $U^a = U(Y_k, L - cX^a) + \beta_k V(Y_p, A(X^a, G))$  with  $\beta_k \in ]0; 1[$  is a parameter corresponding to the degree of filial benevolence. Finally, we assume that  $U$  and  $V$  are twice continuously differentiable and strictly concave in both arguments.

We can now characterize the economic program for each agent. For the child of type a, the maximization program is  $\max_{X^a} U(Y_k, L - cX^a) + \beta_k V(Y_p, A(X^a, G))$ , while the child of type b solves the problem  $\max_{X^b} U(Y_k, L - cX^b)$ . Immediately, one finds that the optimal value of transfer for the nonaltruistic agent is  $X^b = 0$ : only agents of type a are expected to provide time-related resources to their parents ( $X^a > 0$ ). Before studying the effects of variables that affect the optimal value of upstream assistance, we look at the dynamics of social behaviour across generations.

### 2.3. Cultural transmission of altruistic values

Cultural diffusion mechanisms are cognitive information processors that allow individuals to acquire information in some fashion from other individuals with whom they associate through observation and imitation (Cavalli-Sforza and Feldman, 1981; Boyd and Richerson, 1985). Given bounded rationality, cultural transmission capacities allow all individuals cut short the cost of search and experimentation and, instead, to benefit from the cumulative experiences observed in the behaviour of others. Therefore, we model the transmission of altruistic values and preferences as occurring through social learning.

We suppose that children acquire an altruistic behaviour through observation, imitation and adoption of cultural models with which they are matched. The socialization process is defined as follows (see Bisin and Verdier, 1998, 2001). Children are first matched with their family model, i.e. a vertical transmission. Then they are matched with the population at large, i.e. an oblique transmission dealing with role models. In our framework, socialization occurs as the unintended by-product of the observed behaviours (see also Coleman, 1990). Thus, the socialization of an agent occurs in two steps. First, the naïve

child is exposed to the parental model, which may be of type a or b, and adopts the parents' preferences with probability  $\pi^i$ ,  $i = a, b$ . We further assume the following structure for the probability of being altruistic:

$$\pi^i = \pi(X^i) \quad (3)$$

with  $\pi'(X^i) > 0$  and  $\pi(0) = 0$ . This condition stipulates that the child's preferences are influenced by the observed behaviour of the middle-aged generation helping their own elderly parents. The foundations of this hypothesis are in the literature on social learning in socio-psychology and child development (see, among others, Bandura and Walters, 1963; Baumrind, 1967; Bandura, 1995). As shown by Bandura (1986), children still living in the parental home are subject to visible parental behaviour, the repetition of which strengthens the preference shaping effect on their attitudes. Second, with a probability  $(1 - \pi(X^i))$ , the child is matched randomly with an individual of the middle-aged generation and adopts the preferences of that individual, which may be either altruistic or egoistic feelings towards the elders.<sup>9</sup>

More precisely, let us denote by  $n_t$  the proportion at time  $t$  of individuals of the middle-aged generation who are altruistic, i.e. of type a. Hence, transition probabilities  $P_t^{ij}$  that a parent of type  $i$  has a child adopting a preference of type  $j$  are given by:

$$P_t^{aa} = \pi(X_t^a) + (1 - \pi(X_t^a))n_t \quad (4)$$

$$P_t^{ab} = (1 - \pi(X_t^a))(1 - n_t) \quad (5)$$

$$P_t^{bb} = \pi(X_t^b) + (1 - \pi(X_t^b))(1 - n_t) \quad (6)$$

$$P_t^{ba} = (1 - \pi(X_t^b))n_t \quad (7)$$

We are now in a position to characterize the dynamics of behaviour for the agent of type a, which is defined by:

$$n_{t+1} = n_t P_t^{aa} + (1 - n_t) P_t^{ba} \quad (8)$$

Using the transition probabilities (4) and (7), and since the optimal value of the transfer amount for an agent with preferences of type b is  $X^b = 0$ , we deduce that:<sup>10</sup>

$$n_{t+1} - n_t = n_t(1 - n_t)\pi(X_t^a) \quad (9)$$

The diffusion of filial altruistic values is given by the dynamics of the difference Eq. (9). The long term dynamic equilibrium is described by the following proposition.

<sup>9</sup> There are three generations in our theoretical framework, i.e. children, parents and grandparents. The socialization process occurs when the agent is a child; as claimed by Becker (1993, 1996), parents influence the experiences of their children, especially during the formative early years. So, the naive agent adopts a preference of type a or b in childhood, but these preferences (either altruistic or selfish) are only implemented during the middle-age period.

<sup>10</sup> The fraction  $n_{t+1}$  of adult individuals of type a in period  $t+1$  is calculated to be  $n_{t+1} - n_t = n_t(1 - n_t) \times (\pi(X_t^a) - \pi(X_t^b))$ , but  $\pi(X_t^b) = 0$  since we have assumed that  $\pi(0) = 0$ .

**Proposition 1.** *The steady states of the dynamics of the distribution of preferences for altruistic filial values are  $n = 0$  and 1. However, the solution  $n = 0$  is a locally unstable steady state.*

**Proof.** Consider the dynamic equation  $n_{t+1} - n_t = n_t(1 - n_t)\pi(X_t^a)$ . It is obvious that  $n = 0$  and 1 are steady states. The stability of the steady states depends on the derivative of the increment  $n_{t+1} - n_t$  with respect to  $n_t$ , evaluated respectively at  $n = 0$  and 1. If we denote  $\Delta n_t = n_{t+1} - n_t$ , we arrive at:

$$\frac{d\Delta n_t}{dn} \Big|_{n=0} = \pi(X_t^a)$$

$$\frac{d\Delta n_t}{dn} \Big|_{n=1} = -\pi(X_t^a)$$

Since  $d\Delta n_t/dn|_{n=0} > 0$  and  $d\Delta n_t/dn|_{n=1} < 0$ , it follows that  $n = 0$  is a locally unstable steady state, while  $n = 1$  is a locally stable steady state.  $\square$

**Corollary 1.** *The cultural system monotonically converges in the long run to an homogenous population having parental obligations.*

Thus, this model of cultural transmission explains why the altruistic type of preferences endogenously survives evolutionary selection while the selfish type of preferences does not. Since only altruistic agents provide time-related assistance to their elders and since the probability of cultural imitation is an increasing function of this amount of upstream help, the meme of filial obligations spreads over the population and survives across successive generations inside the family.

Hence, one expects that individuals who helped their elders in the past are more likely in return to receive assistance from their children in old age. There is an intergenerational correlation of attitudes about obligations to kin. This supports the sociological results reported in Rossi and Rossi (1990, chap. 5) that a stronger family cohesion has a positive effect on attitudes about parental obligation. In order to test the cultural model, it seems useful to contrast this prediction with the alternative approaches. Both in the altruism and exchange models, the decision to help one's parents does not depend on the attitudes of parents toward their own elders, and no intergenerational correlation in the attitudes of upstream transfers is, therefore, expected.

#### 2.4. Comparative statics

We have described the cultural transmission for preferences. We now characterize the optimal solution for intergenerational transfers given the two types of agents. We want to analyze predictions of the model and several comparative statics are derived.

**Proposition 2.** *The optimal choice of transfer for the two types of agents are:*

- (i) *for a selfish agent,  $X^{b*} = 0$*
- (ii) *for an altruistic agent,  $X^{a*} = X^a(Y_k, L, c, \beta_k, Y_p, G)$  with  $\partial X^{a*}/\partial Y_k < 0$ ,  $\partial X^{a*}/\partial L > 0$ ,  $\partial X^{a*}/\partial c < 0$ ,  $\partial X^{a*}/\partial \beta_k > 0$ ,  $\partial X^{a*}/\partial Y_p < 0$  and  $\partial X^{a*}/\partial G < 0$*

**Proof.** For an agent with preferences of type b, the solution  $X^{b*}$  of the problem choice  $\max_{X^b} U(Y_k, L - cX^b)$  is  $X^b = 0$ . For the agent of type a, the optimal solution  $X^{a*}$  is given by  $\max_{X^a} U(Y_k, L - cX^a) + \beta_k V(Y_p, A(X^a, G))$ . The first-order condition is:

$$-c \frac{\partial U}{\partial I^a} + \beta_k \frac{\partial V}{\partial A} \frac{\partial A}{\partial X^a} = 0$$

At the equilibrium, the marginal cost for the child of transferring time-related resources to elders is equal to the parents' weighted marginal benefit from receiving services. The unique solution  $X^{a*}$  depends on the values of  $Y_k, L, c, \beta_k, Y_p$  and  $G$ . Using the implicit function theorem, we can investigate the effects of these exogenous variables on the equilibrium choice:

- $\text{sgn}(\partial X^{a*} / \partial Y_k) = \text{sgn} - c(\partial^2 U / \partial I^a \partial Y_k) < 0$  since the leisure is a normal good;
- $\text{sgn}(\partial X^{a*} / \partial L) = \text{sgn} - c(\partial^2 U / \partial I^a \partial L) < 0$  given the concavity of  $U$ ;
- $\text{sgn}(\partial X^{a*} / \partial c) = \text{sgn}((-\partial U / \partial I^a) + cX^{a*}(\partial^2 U / \partial I^a \partial c)) < 0$ ;
- $\text{sgn}(\partial X^{a*} / \partial \beta_k) = \text{sgn}(\partial V / \partial A)(\partial A / \partial X^{a*}) > 0$ ;
- $\text{sgn}(\partial X^{a*} / \partial Y_p) = \text{sgn}(\partial^2 V / \partial A \partial Y_p) < > 0$  depending on whether attention  $A$  and income  $Y_p$  are complementary or substitute goods;
- $\text{sgn}(\partial X^{a*} / \partial G) = \text{sgn}((\partial V / \partial A)(\partial^2 A / \partial X^{a*} \partial G) + (\partial^2 V / \partial A^2)(\partial A / \partial G)(\partial A / \partial X^{a*})) < > 0$ , so that we can also write  $\text{sgn}(\partial X^{a*} / \partial G) = \text{sgn}((\epsilon_G^{AX^{a*}} / \epsilon_G^A) - \sigma_r^A)$  where the elasticities  $\epsilon_G^{AX^{a*}}$  and  $\epsilon_G^A$  are respectively defined as  $\epsilon_G^{AX^{a*}} = (G / \partial A / \partial X^{a*})(\partial^2 A / \partial X^{a*} \partial G) > 0$  and  $\epsilon^A = (G / A)(\partial A / \partial G) < > 0$ , and  $\sigma_r^A$  is the coefficient of relative risk aversion for attention such that  $\sigma_r^A = - (A / \partial V \partial A)(\partial^2 V / \partial A^2) \geq 0$ .  $\square$

Let us briefly interpret these theoretical results. An adult with a low level of income is more likely to provide care to parents, and is also expected to devote more time-related resources with an increase of leisure time. The higher the opportunity cost of upstream help, the less the time the child devotes to parents. When the two generations live farther apart, it is more difficult to transfer time due to physical distance. These variables clearly affect the time price on the donor's time transfer, but with different marginal effects. In particular, having to travel a long distance to visit one's parents is likely to exert a greater effect on time price than a moderate variation in the child's level of income. A last variable for the child is intensity of benevolent feelings. Not surprisingly, increased altruism enhances time transfers to the parents. This may underlie gender differences in helping behaviour: daughters usually take on greater parent-care roles.<sup>11</sup>

The economic situation of the parents may positively or negatively affect the amount of services from the child. When care supply and parental income are complementary goods, richer parents are expected to receive more attention from their siblings. The converse holds for substitute goods and transfers are then compensatory. In the general case, the relationship between the amount of family and public assistance cannot be signed. We have to consider the two following situations. First, when  $\partial^2 A / \partial X^{a*} \partial G$  is negative, ( $\epsilon_G^{AX^{a*}} < 0$ ), the two types of transfers are substitutes, which leads to a crowding-out effect. Second, when  $\partial^2 A / \partial X^{a*} \partial G$  is positive, an increase in the amount of institutional help

<sup>11</sup> In experiments on gender differences in altruism, Andreoni and Vesterlund (2001) find that women are more altruistic when the price of giving is high and care more about equalizing payoffs. See also Eckel and Grossman (1997).

may still increase or decrease the family transfer value. More precisely, one expects that  $\partial X^{a*}/\partial G$  is positive (respectively negative) when  $\epsilon_G^{AX^{a*}}/\epsilon_G^A > \sigma_r^A$  (respectively,  $\epsilon_G^{AX^{a*}}/\epsilon_G^A < \sigma_r^A$ ), in which case a low value for relative risk aversion  $\sigma_r^A$  increases the total hours of care provided by the child. Because affection has no close market substitute, the impact of an in-kind public transfer is more likely to reinforce the child's caregiving behaviour, according to the model.

To test the cultural transmission of altruism value against other altruism and exchange motivations behind private transfers inside the family, we must find some predictions of the rival theories that can be empirically falsified.<sup>12</sup> It must be noticed that most of the previous effects for covariates in Proposition 2 also hold in the altruism and exchange models. For example, in the alternative approaches, the amount of care is positively influenced by the donor's degree of benevolence and it may either increase or decrease with the recipient's level of income (Altonji et al., 1997; Cox, 1987). However, we noticed earlier that neither the exchange and exogenous altruism models support any correlation in the caregiving behaviour of different generations.

We now report on an empirical test of the cultural model of altruism by investigating on intergenerational transfers between the generations inside the family in France.

### 3. Time-related transfers to parents in France

#### 3.1. Data

The data that we use in this study come from a French survey conducted by the Caisse Nationale d'Assurance Vieillesse in 1992 and entitled "Enquete Trois Gnrations." The main purpose of this cross-sectional data set, which is based on three generations of randomly selected families, is to examine the nature, form and dynamics of familial relationships (see Attias-Donfut and Wolff, 2000).

The sample of families was constructed by focusing on an intermediate generation and thereafter by moving on to their parents and adult children. The survey was anchored to a random sample of middle-aged adults born between 1939 and 1943 drawn from the French census of 1990. The pivots were contacted by telephone to ascertain the presence of at least one surviving parent and one adult child.<sup>13</sup> A sample of 1958 individuals was then constructed from respondents meeting the above conditions of the survey. Respondents were asked to provide the addresses of one of their parents and one of their adult children, who were next interviewed with the same exhaustive questionnaire. Finally, 1217 interviews were completed among the grandparent generation aged from 68 to 92, and 1493 questionnaires were carried out among the adult children aged from 19 to 36. The full sample includes 4668 respondents corresponding to 1958 trigenerational families and it is representative of the 60% of the 1939–1943 birth cohort belonging to a family comprising at least three adult generations.

<sup>12</sup> Since the demonstration effect theory is based on irrational behaviour, we do not retain this theory as providing hypotheses to be tested against the data.

<sup>13</sup> The latter had to be noncoresident and 18 or above, or coresident if older than 22 and not a student.

For the various generations, this survey includes detailed information about cash and time-related transfers carried out both with parents and children as well as the frequencies of contact and visits, given or received. We have previously stressed the importance of the transfers' composition from parents to their elders to test the model of cultural transmission (see Cox and Stark, 1996). In order to influence the behaviour of their children, even in an unintentionally way, it is in the parents' interest to make regular in-kind transfers rather than upstream cash gifts; in addition, when transfers take the form of attention, parents have to favour visits rather than telephone calls and mail, owing to their greater visibility. However, these variables of attention may set a problem for the analysis, since it is sometimes difficult to identify whether the recipient of these in-kind services is a parent or grandparent.<sup>14</sup>

Therefore, we focus on time-related transfers in the form of old age and dependence support that are given by the middle-aged adults to their elders. These transfers flow upward. Intergenerational redistribution through upstream assistance is more likely for the selected households. The need of filial attention and services is greater for the elderly, and potential donors, aged between 49 and 53 years, have time resources to help their parents, since their own children have already grown up. In the empirical analysis, we account for the complete characteristics of both donors and recipients by matching the answers of the interviewed pivots and those of the interviewed grandparents, which avoids biases for the econometric estimates (Altonji et al., 1997). The selected sample finally includes 1217 observations corresponding to the pivot-elderly pairs. Descriptive statistics for the data are in Table 1: 25.4% of the pivots provide care to their elders and the transfers represent nearly 7 h per week for the donors.

In order to assess the robustness of our empirical results, we also examine the frequency of contact either by visits, telephone calls or letters between both generations and the frequency of visits received by the elders from all children of the family. In the survey, the grandparents are asked about many social and economic characteristics for each child, so that we are able to control for unobserved heterogeneity within the family using a random effect model in the multivariate analysis. For each child, the frequencies of attention are converted in the appropriate number of annual contacts following the method described in greater detail by Cox and Rank (1992) and Cox and Stark (1996). This child level sample, where each child is counted as one observation, includes 4228 observations corresponding to 1189 families after deleting the missing observations.

The survey allows us to carry out a test of the cultural transmission model by looking at the effects of the following variables upon upstream transfers. For the middle-aged adults, the data set includes the sex of the respondent, age, presence of a spouse, number of siblings and children, level of education, amounts of income and wealth, and geographical distance, which is positively correlated with the price of services.<sup>15</sup> Concerning the

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<sup>14</sup> For example, increased visits from parents to grandparents with young children around can be explained by the need of grandchildren care, which is a service from grandparents to parents (Wolff, 2001). This situation is more likely to occur when the middle-aged respondents are rather young.

<sup>15</sup> The survey indicates the joint amount of economic resources for the pivot respondent and his spouse, without any indication about the intrahousehold distribution. There is no information about the level of economic resources for all children in the child level file.

Table 1  
Descriptive statistics of the sample

Variable	All respondents		Time help given		No time help given	
	Mean	S.E.	Mean	S.E.	Mean	S.E.
<i>Upstream time transfers</i>						
Proportion giving	0.254	0.44	1.000	0.00	0.000	0.00
Mean given (hours per week)	1.749	4.41	6.890	6.43	0.000	0.00
<i>Elder's characteristics</i>						
Female	0.745	0.44	0.809	0.39	0.724	0.45
Age	77.864	5.50	79.819	5.68	77.198	5.27
No spouse	0.664	0.47	0.770	0.42	0.628	0.48
Education (end of school age)	13.250	3.49	13.013	3.14	13.330	3.60
Health status						
Good	0.399	0.49	0.324	0.47	0.425	0.49
Fair	0.376	0.48	0.382	0.49	0.374	0.48
Poor	0.224	0.42	0.294	0.46	0.200	0.40
Receipt of professional help	0.273	0.45	0.375	0.49	0.238	0.43
Income (10E – 4)	0.623	0.46	0.573	0.39	0.640	0.48
Net wealth (10E – 6)	0.374	0.55	0.269	0.37	0.410	0.59
Care for one's elderly parents in the past	0.495	0.50	0.537	0.50	0.481	0.50
<i>Respondent's characteristics</i>						
Female	0.537	0.50	0.660	0.47	0.494	0.50
Age	50.907	1.49	51.003	1.50	50.874	1.49
No spouse	0.105	0.31	0.133	0.34	0.096	0.29
Number of siblings	2.792	2.47	2.259	2.04	2.974	2.57
Children						
Number of boys inside household	0.537	0.74	0.447	0.65	0.567	0.77
Number of girls inside household	0.385	0.63	0.382	0.59	0.387	0.64
Number of children outside	1.729	1.23	1.738	1.07	1.726	1.28
Education (end of school age)	16.991	3.35	16.913	3.35	17.018	3.36
Income (10E – 4)	1.566	1.10	1.544	1.09	1.574	1.10
Net wealth (10E – 6)	0.877	0.81	0.910	0.77	0.865	0.82
Distance from parents (10E – 2)	0.647	1.40	0.259	0.71	0.779	1.55
Financially helped by parents in the past	0.282	0.45	0.311	0.46	0.272	0.45
Benefit from child care in the past	0.372	0.48	0.421	0.49	0.356	0.48
Number of observations	1217		309		908	

Source: Survey CNAV Trois Générations 1992.

relevance of an exchange, we know whether middle-aged adults have received cash gifts or services in the form of child care from parents in the past. For grandparents, the survey contains information on sex, age, and existence of a spouse, level of education, amounts of income and wealth as well as the status of health and the receipt of professional help. These latter two variables control for the need for old age support from pivots. Elders also mention whether at a middle-adult stage of their life they provided time-related assistance to their own parents. This information makes it possible to evaluate the relevance of the cultural transmission hypothesis concerning upstream care between the successive generations inside the family.

In France, previous research about motives for private transfers has cast doubt both on the altruism and exchange hypotheses. An increase in the child's income increases the gift value received from parents and the test of a unitary difference in transfer-income derivatives is rejected (Arrondel and Laferrère, 2001; Wolff, 2000). However, attention that children devote to help the parents has little association with the receipt of a cash gift (Wolff, 1998). The fact that inter vivos transfers and bequests are in most cases equally shared among siblings (in about 90% of families) sets a problem. Parents who have been financially helped by elders in the past are also more likely to help their own children (Arrondel and Masson, 1991; Arrondel and Wolff, 1998). This influence of past transfers received may be interpreted in favor of retrospective motives where parents do unto their children as they would have been done unto themselves (Masson and Pestieau, 1997), but it also supports the strategic self-interest model proposed by Cigno (1991) where familial transfers are part of self-enforcing credit agreements.<sup>16</sup>

As these two explanations are consistent with the preference shaping hypothesis, we now examine the motives for time-related transfers from middle-aged adults to their elders in France. In the light of the various theoretical models, our empirical purpose is twofold. First, we discuss the effects of the demographic and economic variables both for the recipients and the donors that influence the provision of filial services and attention. Second, we attempt to evaluate whether there exists a reproduction of upstream transfer behaviour across generations.

### 3.2. *Econometric analysis*

We now turn to the multivariate analysis related to support in old age. We begin with the question of whether or not informal care was provided to the elderly using a probit model with the dependent variable equal to one if a time-related transfer is made and zero otherwise. The results are reported in Table 2. Then, we examine the effects of the same covariates used as regressors in the probit equation on the amount of time given, expressed in hours per week. Since the time amounts are truncated at zero hours, we consider a tobit specification estimated by a maximum likelihood technique shown in Table 3.<sup>17</sup> According to the econometric results, the same explanatory variables are almost statistically significant in both regressions and we therefore discuss simultaneously estimates concerning the probability of making a transfer and the amount of time transferred.

The characteristics of the elderly provide information about their need for informal care. Data show that time-related assistance is mostly determined by the degree of disability of elders, since transfers are targeted towards parents with important personal needs. The older parents and those with poor health receive significantly more time from their middle-aged children. Old age support is positively associated with the existence of professional help at the 1% level. Women and elders with no spouse also elicit a greater

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<sup>16</sup> Cremer and Pestieau (1993) also develop a model of preference shaping where parents inculcate values in the children in order to obtain more attention from them in a later stage of their life.

<sup>17</sup> Altonji et al. (1996) and Schoeni (1997) also retain a tobit specification for the determinants of time spent helping parents. As the tobit model requires that the error term be normally distributed, we also estimated a generalized tobit model, for which results do not change substantially.

Table 2  
 Probit estimates of time assistance given to parents

Variable	All respondents		All respondents		Working respondents	
	Coefficient	<i>t</i> -test	Coefficient	<i>t</i> -test	Coefficient	<i>t</i> -test
Constant	– 3.413	– 2.21	– 3.463	– 2.23	– 3.855	– 2.12
<i>Elder's characteristics</i>						
Female	0.323	2.77	0.321	2.74	0.308	2.23
Age	0.052	6.11	0.052	6.05	0.060	6.04
No spouse	0.190	1.71	0.190	1.71	0.227	1.71
Education						
No diploma	0	–	0	–	0	–
Primary school	– 0.152	– 1.46	– 0.154	– 1.48	– 0.228	– 1.87
More than primary school	0.031	0.20	0.030	0.19	– 0.010	– 0.06
Health status						
Good	0	–	0	–	0	–
Fair	0.118	1.16	0.117	1.16	0.136	1.15
Poor	0.359	3.11	0.360	3.12	0.477	3.51
Receipt of professional help	0.284	2.90	0.284	2.90	0.304	2.69
Income (10E – 4)	0.146	1.10	0.147	1.11	0.190	1.19
Net wealth (10E – 6)	– 0.381	– 3.47	– 0.382	– 3.47	– 0.351	– 2.88
Care for one's elderly parents in the past	0.182	2.11	0.179	2.06	0.239	2.36
<i>Respondent's characteristics</i>						
Female	0.494	5.58	0.492	5.55	0.395	3.83
Age	– 0.037	– 1.25	– 0.036	– 1.22	– 0.043	– 1.23
No spouse	0.248	1.78	0.248	1.77	0.423	2.65
Number of siblings	– 0.084	– 4.29	– 0.083	– 4.12	– 0.076	– 3.27
Children						
Number of boys inside household	– 0.075	– 1.17	– 0.076	– 1.18	– 0.185	– 2.27
Number of girls inside household	0.037	0.52	0.036	0.51	0.042	0.48
Number of children outside	– 0.030	– 0.79	– 0.030	– 0.79	– 0.029	– 0.63
Education						
No diploma	0	–	0	–	0	–
Primary or secondary school	0.020	0.19	0.020	0.19	0.056	0.44
Baccalaureate	0.138	0.99	0.136	0.97	0.249	1.55
Graduate or postgraduate studies	0.022	0.13	0.019	0.11	0.096	0.50
Income (10E – 4)	0.018	0.33	0.018	0.33	0.053	0.88
Net wealth (10E – 6)	0.034	0.54	0.031	0.50	– 0.007	– 0.09
Distance from parents (10E – 2)	– 0.265	– 5.46	– 0.264	– 5.41	– 0.277	– 4.81
Financially helped by parents in the past			0.011	0.12		
Benefit from child care in the past			0.029	0.32		
Number of observations	1217		1217		948	
Number of recipients	309		309		221	
Log likelihood	– 580.09		– 580.03		– 423.18	
$\chi^2$	218.89		219.00		183.21	
Pseudo $R^2$	0.159		0.159		0.178	

Source: Survey CNAV Trois Générations 1992.

level of services from the pivots. Because women have a longer life expectancy and tend to marry men who are older, living alone is much more common for older women and women have more needs and greater levels of disability than men. That transfers are

Table 3  
Tobit estimates of time assistance given to parents

Variable	All respondents		All respondents		Working respondents	
	Coefficient	t-test	Coefficient	t-test	Coefficient	t-test
Constant	– 27.916	– 1.84	– 28.967	– 1.90	– 26.892	– 1.92
<i>Elder's characteristics</i>						
Female	2.679	2.35	2.663	2.32	2.330	2.19
Age	0.512	6.10	0.507	6.01	0.520	6.66
No spouse	1.343	1.23	1.338	1.23	1.558	1.50
Education						
No diploma	0	–	0	–	0	–
Primary school	– 1.132	– 1.11	– 1.171	– 1.15	– 1.805	– 1.91
More than primary school	0.880	0.59	0.847	0.56	– 0.225	– 0.17
Health status						
Good	0	–	0	–	0	–
Fair	1.649	1.65	1.637	1.64	1.824	1.97
Poor	3.844	3.40	3.873	3.42	4.013	3.79
Receipt of professional help	2.382	2.51	2.384	2.51	1.653	1.89
Income (10E – 4)	2.594	2.04	2.605	2.05	2.703	2.23
Net wealth (10E – 6)	– 4.420	– 3.97	– 4.419	– 3.97	– 3.072	– 3.17
Care for one's elderly parents in the past	1.824	2.15	1.764	2.08	1.986	2.53
<i>Respondent's characteristics</i>						
Female	4.890	5.54	4.879	5.51	2.685	3.35
Age	– 0.501	– 1.72	– 0.478	– 1.64	– 0.502	– 1.85
No spouse	2.365	1.75	2.353	1.75	3.497	2.90
Number of siblings	– 0.826	– 4.21	– 0.797	– 3.98	– 0.588	– 3.20
Children						
Number of boys inside household	– 0.077	– 0.12	– 0.080	– 0.13	– 1.338	– 2.09
Number of girls inside household	0.556	0.81	0.553	0.80	0.308	0.47
Number of children outside	– 0.032	– 0.09	– 0.027	– 0.07	– 0.015	– 0.04
Education						
No diploma	0	–	0	–	0	–
Primary or secondary school	0.669	0.64	0.658	0.63	1.014	1.03
Baccalaureate	1.771	1.29	1.692	1.23	2.090	1.67
Graduate or postgraduate studies	0.971	0.57	0.868	0.51	1.030	0.68
Income (10E – 4)	– 0.200	– 0.37	– 0.176	– 0.33	0.254	0.53
Net wealth (10E – 6)	0.234	0.38	0.167	0.27	0.086	0.15
Distance from parents (10E – 2)	– 2.600	– 5.26	– 2.578	– 5.20	– 2.282	– 4.85
Financially helped by parents in the past			0.487	0.52		
Benefit from child care in the past			0.454	0.51		
Number of observations	1217		1217		948	
Left-censored observations	908		908		727	
Log likelihood	– 1493.65		– 1493.38		– 1026.09	
$\chi^2$	208.85		209.37		186.17	
Pseudo $R^2$	0.065		0.066		0.083	

Source: Survey CNAV Trois Générations 1992.

targeted towards the most needy parents is consistent with the cultural transmission model since children are genuinely altruistic; the crowding-in effect for private effort is also compatible with this theoretical hypothesis according to Proposition 2.

Concerning the economic situation of the recipients, the estimates for education are statistically insignificant. The probability of receiving informal care is positively affected by the parental earnings, although this effect is just significant. Nevertheless, the marginal impact of income is low and close to zero, suggesting that intergenerational altruism within the family remains weak (Cigno et al., 1998). As indicated by the negative effect of wealth, richer parents actually receive less informal care than poorer parents. That transfers fall as the parental wealth rises suggests that the threat of disinheritance does not affect donors' behaviour and hence strategic motives are not significant determinants of long-term care decisions. Both results are compatible with the cultural model of filial altruism. Even if the model makes no clear prediction for the recipients' resources, one usually expects a compensatory redistribution under altruistic motives. Conversely, these results rather disagree with intertemporal self-interest exchange, for which individuals would be obliged to care for parents whatever the economic situation of the latter may be, if they wanted this behaviour to be imprinted on their children or if they want to be paid back later by their children through exchange.

Let us now turn to the characteristics of the caregiving children. The data set indicates that the respondents who provide regular assistance to their elders are more likely to be women. This effect is significant at the 1% level and the probability of making time-related transfers rises by 13.9 percentage points for a woman at the sample mean. In order to control for specialization within the household, we also restrict the sample to employed respondents and estimate the same probit and tobit regressions. We find a similar pattern of daughters providing more care than sons, even if the marginal effect slightly decreases with a 10.5 additional percentage point of probability. Hence, sex differences in the provision of care cannot just be explained by male–female differences in the shadow price of time, as pointed out by Cox and Stark (1996).<sup>18</sup> Daughters may provide much higher levels of parental care than sons because of a greater intensity of altruism.

Another variable that influences the probability of giving is the presence of a spouse. According to the data, the parameter estimate on the binary variable for having no spouse is positive both in the probability and time amount equations. This result is statistically significant at the 10% level in the regression for the whole sample and even at the 1% level when the sample is restricted to active respondents. In the latter case, living alone increases the probability of caregiving by 12.7 percentage points. Various interpretations may be put forward. For example, this variable represents an aspect of the value of the donor's time. A middle-aged adult with no spouse has more time-related resources to devote to parents.

We also investigate the effect of the respondent's number of children. In the empirical analysis, the parameter estimate on this regressor is negative, but it remains statistically insignificant and of small magnitude. The result that old age support does not significantly depend on the number of children is fully consistent with a process of intergenerational transmission of altruistic behaviour. Conversely, one of the predictions of the irrational

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<sup>18</sup> Kotlikoff and Morris (1989) also show that the greater tendency of daughters than of sons to provide elder care cannot only be explained by the lower price of women's time. Even when equally paid, one observes that women help more their parents.

demonstration effect is the fact that having children should matter for old age support. Clearly, this result does not hold in our data.<sup>19</sup>

Also, the number of siblings is negatively correlated both with the likelihood and amount of upstream assistance. When elders have many children, the probability that a particular child makes a transfer is reduced. Indeed, the well-being of the parents may be considered as a public good, thereby giving rise to free-riding behaviour in the case where there are multiple altruistic children (see Schoeni, 2000). There is no clear relationship in the data between the donor's economic situation and the supply of private services. The pivot's income and wealth are not significant predictors of intergenerational transfers made. The estimates also indicate that distance is strongly negatively related to the provision of transfers at the 1% level, a variable that affects the price of services for the middle-aged adults. The geographical distance between the generations increases the cost of providing time-related help to elders.<sup>20</sup> All of these empirical results are in accordance with the predictions of the cultural model of altruistic values.

According to the trigenerational data set, there exists a cultural transmission of attitudes regarding parental care. The empirical results show that elders who themselves cared for their own parents in the past are characterized by a greater probability of being helped by their children. The parameter estimate is significant at the 5% level and, at the sample mean, the probability of receiving informal care increases by 5.2 percentage points when the elderly themselves devoted time-resources to parents in the past. While this positive effect contradicts the hypotheses of exogenous altruism and exchange where the decision to make a transfer does not depend of assistance granted in the past, the result is fully consistent with a model of cultural transmission of altruism relying on an unintended socialization.

A main feature of the data is that the econometric analysis of both contact and visits from children to parents leads to the same cultural transmission effect. Using the child level file, we estimate separate linear equations for the two dependent variables using ordinary least squares with Huber–White corrected standard errors (White, 1980). We also control for the unobserved familial heterogeneity using a generalized estimating equation extension to GLS random-effects estimator. According to the results reported in Table 4, individuals who have in the past supported their own elderly parents have greater contact and are more likely to be visited by their adult children. In that case, contact and visits between generations increase by almost 2.5 units per year.<sup>21</sup> Hence, our empirical results show that the better people treat

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<sup>19</sup> We make a distinction between the number of children in and out of the respondent's home, but the difference between the two coefficients is never statistically significant. The estimates also show that the effect of boys inside the household is negative while the number of daughters at home slightly increases informal care, but again the estimates are not significant. These results allow us to reject the irrational demonstration effect theory. On the one hand, the demonstration is expected to be more effective when children live at home rather than outside. On the other hand, caregiving is mainly a female activity, so that the donors should make more transfers to elders when they have daughters rather than sons, with a greater probability of being helped in return in the former case (Cox and Stark, 1996).

<sup>20</sup> In this analysis, the location is supposed to be exogenous to the provision of assistance to elders. There is no good instrument available in the data to test for the exogeneity of distance.

<sup>21</sup> These empirical results also indicate that the level of attention significantly increases for female informal helpers, with about 9 additional contact and 4 additional visits per year after controlling for unobserved familial heterogeneity.

Table 4  
 OLS and GEE random-effects estimates of contact and visits to parents

Variable	Contact				Visits			
	OLS <sup>a</sup>		Random effects <sup>b</sup>		OLS <sup>a</sup>		Random effects <sup>b</sup>	
	Coefficient	<i>t</i> -test	Coefficient	<i>t</i> -test	Coefficient	<i>t</i> -test	Coefficient	<i>t</i> -test
Constant	45.834	5.28	52.573	4.64	25.706	3.01	30.681	3.04
<i>Elder's characteristics</i>								
Female	1.925	1.51	2.509	1.49	0.572	0.48	0.834	0.56
Age	0.262	2.44	0.272	2.03	0.496	4.83	0.495	4.13
Widow	-1.738	-1.58	-1.624	-1.07	-1.180	-1.13	-0.848	-0.63
Education	-1.943	-1.03	-1.700	-0.72	-1.885	-1.10	-2.530	-1.22
Social status								
Farmer	-4.130	-3.24	-4.847	-2.76	0.214	0.18	0.052	0.03
Self-employed	-2.947	-1.62	-2.237	-0.95	-3.107	-1.70	-2.355	-1.11
Executive	-2.794	-0.97	-2.498	-0.58	-8.085	-2.98	-6.803	-1.78
Intermediary	0.209	0.10	1.617	0.56	-1.398	-0.68	-0.643	-0.25
Employee, worker	0	-	0	-	0	-	0	-
Health status								
Good	0	-	0	-	0	-	0	-
Fair	-2.874	-2.64	-2.288	-1.56	-0.607	-0.57	-0.475	-0.37
Poor	-5.613	-4.40	-5.219	-3.03	-3.629	-3.03	-3.494	-2.30
Receipt of professional help	-1.192	-1.09	-0.662	-0.44	-2.874	-2.80	-2.319	-1.76
Income (10E - 4)	1.256	1.04	1.614	0.83	0.525	0.44	0.508	0.30
Net wealth (10E - 6)	0.440	4.69	0.434	3.19	0.206	2.26	0.203	1.68
Care for one's elderly parents in the past	2.737	2.88	2.645	2.05	2.533	2.76	2.659	2.34
<i>Child's characteristics</i>								
Female	8.391	8.57	8.888	9.83	3.556	3.80	3.913	4.33
Age	-0.183	-1.92	-0.253	-2.83	-0.384	-4.14	-0.413	-4.65
No spouse	-2.462	-1.66	-1.247	-0.91	-1.043	-0.73	-0.089	-0.07
Number of siblings	-2.871	-13.49	-3.054	-10.19	-1.962	-9.72	-2.056	-7.84
Number of children	-1.610	-4.17	-1.319	-3.66	-1.428	-3.98	-1.414	-3.95
Presence of grandchildren	0.170	0.14	-0.128	-0.11	1.410	1.24	1.292	1.16
Education	0.907	4.24	0.569	2.62	0.585	2.97	0.352	1.68
Social status								
Farmer	6.972	2.81	7.725	3.54	10.205	4.03	10.140	4.70
Self-employed	0.550	0.30	0.387	0.22	-1.428	-0.80	-1.402	-0.81
Executive	-2.744	-1.45	-2.159	-1.12	-6.814	-3.94	-5.771	-3.04
Intermediary	1.347	0.98	0.967	0.71	-2.232	-1.71	-1.777	-1.31
Employee, worker	0	-	0	-	0	-	0	-
Spouse employed	1.125	1.03	0.759	0.75	-0.374	-0.36	-0.106	-0.11
Distance from parents	-0.037	-23.62	-0.036	-22.25	-0.051	-37.74	-0.051	-31.84
Number of observations	4228		4228		4228		4228	
Number of families	1189		1189		1189		1189	
$F/\chi^2$	44.35		850.38		68.10		1318.87	
$R^2$	0.189				0.249			

Source: Survey CNAV Trois Générations 1992.

<sup>a</sup> Ordinary least squares regression with Huber–White robust standard errors.

<sup>b</sup> Generalized estimating equation extension to GLS random-effects estimator.

their parents in the form of old age support, the higher the value of the treatment they receive latter from their children.

Finally, the data make possible a test of the exchange model where intergenerational transfers are part of an implicit contract for immediate or delayed reciprocity between children and their parents. On account of the repayment obligation, the exchange motive predicts a positive effect of past parent-to-child assistance on the probability of current child-to-parent time transfers. In the survey, the middle-aged adults indicated whether they were financially helped by parents and benefited from child care in the past, up to the date of the interview. The estimates show that the receipt of past transfers does not particularly promote giving help in return (see Table 2). The coefficients on variables for financial gifts and child care received are positive, but not statistically significant at conventional levels. Further, the implied marginal effects are of very small magnitude. Since we find suggestive evidence that earlier parents-to-children transfers do not play a significant role in determining whether the respondents will provide assistance to elders during retirement, our empirical results clearly support the cultural transmission hypothesis.

#### **4. Conclusions**

The purpose of this paper has been to study the motives underlying upstream inter vivos transfers between the generations. We have departed from the traditional approach suggested by Becker (1991) with exogenous altruism and the exchange reciprocity hypothesis. Instead, we have used a model of endogenous altruism, where private transfers are aimed at shaping preferences within the family. Rather than relying on the demonstration effect theory, we have presented a model of cultural transmission of filial altruism in which individuals can be of two types, altruistic or nonaltruistic with respect to their parents, and the probability of a child being altruistic is positively influenced by the amount of upstream care shown by parents.

The predictions of the cultural transmission model are almost observationally equivalent to the one of the demonstration effect, without the logical flaw of the demonstration effect theory. We have shown that only the altruistic type of preferences survives evolutionary selection, and hence the cultural system converges in the long run to a population having kin obligations. The empirical analysis of a French trigenerational survey indicates that only the predictions of the cultural model of filial altruism are borne out by the data, while alternatives approaches (exogenous altruism, exchange) are rejected. In particular, helping one's elders is an effective way to receive services in old age from one's children.

Our paper demonstrates empirically transmission of preferences within the family. This fundamental issue is also pursued by Bisin et al. (2001), who present an empirical analysis of the intergenerational transmission of religious traits through family socialization and marital segregation decisions.

An important feature of our cultural model of altruistic values is that individuals provide help because they are genuinely altruistic. Hence, this process of intergenerational transmission of benevolent behaviour solves the paradox raised by the irrational demonstration effect theory, where there is a completely self-interested motive for altruistic transfers to parents (see Kapur, 1997). As argued by Akerlof (1983) and Frank (1988), the best

way to appear altruistic is to actually behave in an altruistic way, and such genuine altruism is likely to rub off on one's children.

A final comment concerns the policy implications of the model. Any public program that affects current transfers within the family will also influence the level of private assistance in the future, given the dynamic process of socialization. Our empirical results suggest that the expected diminution of the level of pensions in France for future years associated with the high cost of institutional care will result in a rise in informal caregiving efforts between generations and, thus, in an increased transmission for filial altruism inside the family.

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