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The temporal structure of intergenerational exchange: A within-family analysis of parent–child reciprocity

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ABSTRACT

Previous studies of parent–child reciprocity have focused either on the long term (generalized exchange over the life course) or on the short term (concurrent exchange in later life). The purpose of this research was to investigate the linkage between both temporal patterns of reciprocity within an integrative conceptual framework. We assessed whether long-term and short-term reciprocity operated as interdependent mechanisms that initially selected and subsequently relieved intergenerational caregiving relationships. We used data from the Asset and Health Dynamics Among the Oldest Old study (AHEAD) provided by frail, single-living parents of at least two children ($N = 1010$ respondents comprising 3768 parent–child dyads). Fixed-effects conditional logit models estimated between-sibling differences in assistance provided to parents, measured by instrumental help (i.e., assistance with IADLs) and hands-on care (i.e., assistance with ADLs). Key predictors were two measures of financial transfers given to children referring to longer and shorter recall periods. Receiving earlier and current financial transfers increased adult children's propensity to support their parents in later life. The effect of earlier transfers pertained to help rather than care whereas the reverse was true for the effect of current transfers. We found no evidence for a linkage between long-term and short-term reciprocity. Overall, the results indicate that adult children might balance long-term support accounts relative to their siblings, suggesting an intra-generational orientation on equity.

Introduction

The principle of reciprocity is widely regarded as a fundamental mechanism governing intergenerational transfers of time and money (Henretta, Hill, Li, Soldo, & Wolf, 1997; Hjälm, 2012; Hollstein & Bria, 1998; Leopold & Raab, 2011; Silverstein, Conroy, Wang, Giarrusso, & Bengtson, 2002). Understood as a moral norm, reciprocity "defines certain actions and obligations as repayments for the benefits received" (Gouldner, 1960, p. 170). Recipients of intergenerational support remain indebted to the giver until balance is restored by an equivalent repayment. A major reason for the continuing scientific interest in reciprocity is its character as a universal, stable, and reliable norm: If reciprocity influences instrumental assistance between the generations, adult children's support to their elderly parents is unlikely to erode even in rapidly aging societies that burden families with increasing demands for help and care.

The literature has investigated two temporal patterns of reciprocal exchange[1] in parent–child relationships, long-term

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[1] For the purposes of the present study, we employ a rather basic notion of reciprocity building on the premise that receivers adhere to a norm that demands repayment of a debt. Scholarly traditions diverge with regard to the question of *why* this occurs. Economic exchange theory emphasizes self-interested motives behind the reciprocation of a transfer (e.g., avoiding shame and guilt, protecting reputation). Social exchange theory directs attention to the – often long-term – relationships between exchange partners and the role of trust and obligation in building and maintaining social cohesion (Silverstein et al., 2002). It was beyond the scope of the present study to discuss and test these perspectives in detail.

and short-term. The idea of *long-term reciprocity* posits that adult children repay parental support several years or even decades later (Finch & Mason, 1993; Hollstein & Bria, 1998). Accordingly, research on long-term reciprocity has conceptualized earlier parental support given to children as investment strategies or insurance policies (Silverstein et al., 2002) and, from a *within-family* perspective, as a factor influencing the selection of a caregiver among siblings (Henretta et al., 1997). These perspectives share the premise that earlier parental support is exogenous to a child's later assistance.

The idea of *short-term reciprocity* (Leopold & Raab, 2011) relates to late-life situations in which a child already provides support to an infirm parent. In these situations, reciprocity is assumed to operate within a much shorter time interval between giving and receiving. This concept proposes contemporaneous exchange as a disburdening arrangement in which elderly parents give financial support more often to those of their children who provide care.

So far, the ideas of long-term and short-term reciprocity have only been tested separately. The present study attempts to examine both temporal patterns within a common framework. Investigating the nature of their linkage integrates previous research on reciprocity in parent–child relationships and, at a more general level, contributes to understanding how mutual support in families operates. Our conceptual approach suggests two contrasting views: The first posits a sequential linkage of long-term and short-term reciprocity across the family life course. From a within-family perspective, this sequence of exchange patterns involves (long-term) selection and (short-term) disburdening of caregiving relationships. The second view suggests the absence of a sequential linkage, positing that long-term and short-term reciprocity operate independently within families.

We draw on data provided by single-living respondents from the first wave of the Asset and Health Dynamics Among the Oldest Old (AHEAD) study. Using within-family fixed-effects models, these data allow us to jointly investigate long-term and short-term reciprocity in parent–child relationships. Our analysis proceeds in four steps. First, we outline a conceptual model encompassing long-term as well as short-term patterns of parent–child reciprocity. Second, based on this conceptual model, we replicate and reexamine findings from a study that used the AHEAD data to investigate long-term reciprocity in parent–child relationships (Henretta et al., 1997). Third, we test whether the AHEAD data support the concept of short-term reciprocity (Leopold & Raab, 2011). Finally, we examine two contrasting hypotheses about the linkage between both temporal patterns of reciprocity.

Theoretical background

The long-term definition of reciprocity in parent–child relationships refers to their intimate, stable, and lasting character. Although at any one point in time, parent–child relations may appear asymmetrical, a support balance is achieved over the long term according to an implicit contract that demands equivalent compensation of the benefits received. In this sense, adherence to the norm of reciprocity guides a child's later repayment of debts to parents accumulated earlier in life. Dyadic analyses of panel data supported this idea, revealing that earlier financial support from parents produced a time-contingent repayment from an adult child (Silverstein et al., 2002). This exchange of money versus time pointed to an insurance mechanism triggered by parental health decline. A related finding emerged from within-family analyses of support provision to an infirm parent. Henretta et al. (1997) posited that reciprocity operates as a *selection mechanism* determining which child in a family provides assistance. Their study showed that those children who had received more financial support than their siblings were more likely to provide help and care in later life. In fact, previous receipt of transfers emerged as one of the key predictors of later support to parents: In terms of effect size, previous parental transfers were almost as important as gender in predicting a child's propensity to provide support in later life.

In a recent study on short-term reciprocity, we proposed a different temporal structure of reciprocal exchange in late parent–child relationships (Leopold & Raab, 2011). The analytical strategy drew on several ideas from Henretta et al. (1997), using a sample of infirm, single-living parents and estimating fixed-effects models to examine transactional patterns within families in the currencies of money versus time. The purpose of reciprocal exchange, however, was conceptualized differently: Rather than conditioning selection into caregiving, we assumed short-term reciprocity to ease a caregiving relationship that already existed. The corresponding pattern of exchange involved gifts and return-gifts that co-occurred within a time window of less than a year. The idea was that an elderly parent who provided concurrent reciprocation eased stress and burden of a caregiving child and alleviated feelings of dependency in times of physical decline. In contrast to long-term reciprocity, equivalence was less important because parents' contributions were not assumed to be proportional to the assistance received. For parents who required support, the issue was contributing to the best of their abilities rather than engaging in balanced exchange. In our empirical analyses with data from the Survey of Health, Ageing and Retirement in Europe (SHARE), we found that children who provided assistance to a frail parent more than doubled their chances of receiving concurrent financial transfers from that parent compared to non-helping siblings. Importantly, this effect was distinctly related to the intensity of a child's support as an indicator for stress and burden, emerging most clearly if a child provided time-consuming assistance.

It is important to note that in each of these quantitative studies of long-term and short-term reciprocity, children's transfers of time[2] (i.e., instrumental help and care) were exchanged against parents' transfers of money. This *heteromorphic* exchange (i.e., transfers of different currencies) is, on the one hand, consistent with specific age-related needs of both generations. Previous financial transfers from parents, for instance, are often indispensable for adult children to "get a start in life" or to recover from adverse events such as divorce (Leopold & Schneider, 2011). In later life, frail parents are clearly in need of time transfers. Moreover, financial transfers appear to be a more viable form of repayment, as

[2] In this manuscript we use the term time transfer as a broad category encompassing instrumental support of different types and intensities. This term is commonly used in the literature to reference one of the three main currencies of intergenerational transfers (time, money, and space; see Soldo & Hill, 1993).

physically impaired parents are often unable to reciprocate time transfers in the same currency. On the other hand, studying exchange only in the form of time versus money is obviously a limited approach, as it disregards the complexity of possible transfer currencies. Emotional support from parents, for instance, might complement or substitute financial transfers and prove to be particularly important for easing the burden of caregiving children (Merz, Schuengel, & Schulze, 2007; Leopold & Raab, 2011, p. 108). Unfortunately, the information available in the AHEAD data are restricted to transfers of help, care, and money, thus precluding the investigation of intergenerational support exchange based on a more inclusive set of transfer currencies.

A common framework for long-term and short-term reciprocity

Two basic tenets from the sociological literature on exchange suggest that long-term and short-term reciprocity are linked. The first pertains to a within-family perspective, stating that analyses of intergenerational exchange must reach beyond the dyadic view and recognize the family as a small-group structure representing the proximate context of transfer behavior. The second relates past to present exchange. Enduring social bonds accumulate a history of interdependent transfers. Late characteristics of a supportive parent–child relationship are thus shaped by the incidence and quality of earlier transactions (Molm & Cook, 1995). The following discussion is informed by both principles.

A within-family perspective: intra-generational orientation on equity

Fundamental to a within-family perspective on intergenerational exchange is the notion that characteristics of a parent–child dyad are assessed relative to other dyads within the family. This point has long been recognized by qualitative studies (e.g., Connidis & Kemp, 2008; Finch & Mason, 1993; Hequembourg & Brallier, 2005; Matthews, 1987, 2002). The quantitative literature on intergenerational relationships, however, does rarely account for the family as a small group structure surrounding dyadic interactions between parents and children. This research implicitly assumes that a parent's relationship with one child is independent of that parent's relationships with any other child (Pillemer & Suitor, 2008). As a result, most quantitative analyses are clearly limited in understanding important intergenerational phenomena such as the distribution of transfers across children and the negotiation of parental support among siblings.

A few studies exist, however, taking advantage of within-family designs that allow assessing the importance of individual or dyadic characteristics *relative to those of other individuals and dyads within a family* (e.g., Henretta et al., 1997; Kalmijn, 2012; Pillemer & Suitor, 2006). This approach has two main analytical benefits for understanding parent–child reciprocity. First, it controls for all background characteristics that are constant within a family. By the logic of the estimation (fixed-effects, see below), these factors are rendered inconsequential — based on the assumption that they are common to all units within a family. This benefit of a within-family approach is particularly valuable for the study of reciprocity because transfers in both directions might derive from family-level factors that are difficult to measure using standardized survey questions. Family norms arising from the interaction of its members, for instance, are often unmeasured (Bianchi, Hotz, McGarry, & Seltzer, 2008; Pyke & Bengtson, 1996). Thus, one might incorrectly infer parent–child reciprocity from the observation of support exchanged in both directions because shared family norms to unconditionally support each other are not controlled.

The second benefit is that in studies of reciprocity, a within-family design is often superior in modeling the substantive outcome of interest. In the study of family caregiving, for instance, including all adult children into the unit of analysis enables us to understand how the supportive link between an elderly parent and a particular child is affected by other children as alternative or complementary providers. This allows examining a specific caregiving arrangement as an outcome of the negotiation of responsibilities among siblings and as an effort requiring coordination between different providers (Finch & Mason, 1993). As Silverstein and Giarrusso (2010, pp. 1051f) have noted, this approach is "most informative because [it comes] closest to representing caregiving as it is actually experienced in families."

From a within-family perspective, reciprocal obligations of a child are interpreted and negotiated *relative to those of siblings* (Finch & Mason, 1993; Pillemer & Suitor, 2006). This entails that the "traits and behaviors of brothers and sisters within the pool also affect who bears primary responsibility for the care of a disabled parent" (Henretta et al., 1997: 112). Implicit in this view is that siblings are aware of what each of them has received and contributed in the past and evaluate obligations to parent care with respect to their relative position. Qualitative research has provided some support for this contention (Ingersoll-Dayton, Neal, Ha, & Hammer, 2003; Leinonen, 2011). Consequently, the question is not how much support each child owes to the parent in absolute (i.e., dyadic) terms but whether siblings who received *more than others* are expected and feel obliged to repay the *difference*. Considering long-term reciprocity, this theoretical distinction is important because it concerns the principle of *equity* which states that repayments should be proportional to debts. If a long-term support debt to parents is defined in a strictly dyadic way (*inter*-generational orientation on equity), most adult children must be considered substantially overbenefited when parents have reached old age, at least in western economies. A child's later selection into time-consuming transfers of care may thus be regarded an equitable repayment to earlier parental support. A within-family perspective, however, implies that long-term support debts to parents are assessed relative to those of siblings (*intra*-generational orientation on equity). As a result, previous assistance given equally to each child ("baseline support") is disregarded. This point is illustrated by a simple example in Fig. 1.

The figure presents support accounts of a parent (G1) and two adult children (G2) at two points in time. The bars in the left panel indicate each child's long-term support debt to the parent ("inter-debt") from earlier and middle periods of the family life course. The shaded part of the upper bar shows that Child 1 has received more support than Child 2 ("intra-debt"). For the purpose of the present study, this difference may be thought of as a sizeable financial transfer that only Child 1 received. Note that this difference is small

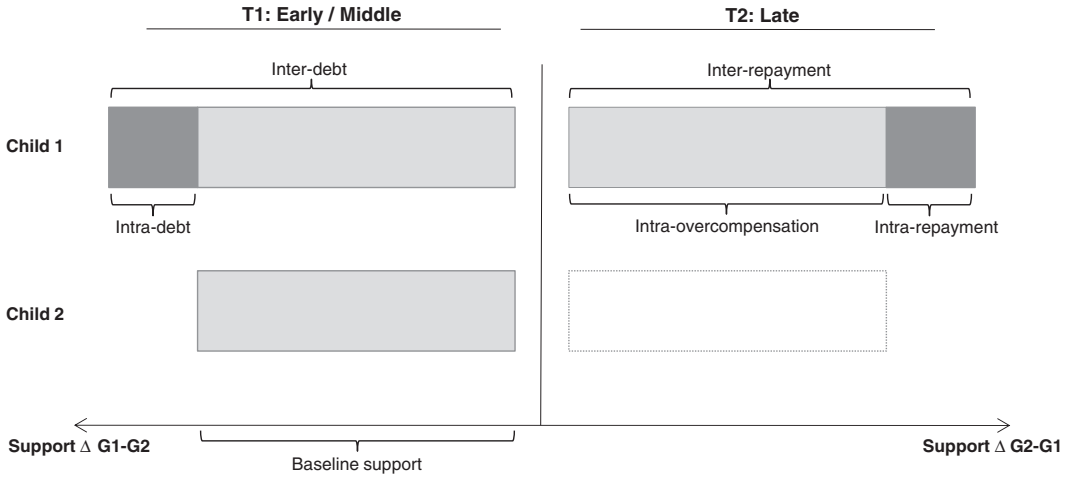

Fig. 1. Long-term reciprocity and intra-generational orientation on equity.

when compared to the amount of baseline support that both children received equally. The right panel illustrates a late-life situation in which Child 1 has selected into caregiving. Schematically, we may assume that this transfer constitutes a proportional repayment to earlier parental support ("inter-repayment"). The *relative debt* compared to the inactive Child 2, however, is clearly overcompensated for.

If siblings' negotiation of parent care involves an intra-generational orientation on equity, relatively small differences in terms of previously received support appear unlikely to influence the selection into care along with its potentially far-reaching social, mental, and physical consequences for the caregiving child (Robison, Fortinsky, Kleppinger, Shugrue, & Porter, 2009; Savla, Almeida, Davey, & Zarit, 2008). Instead, less-demanding help such as assistance with household chores could constitute an equitable repayment relative to a sibling who received less support from parents in previous life.

These considerations suggest that long-term reciprocity may govern selection into practical help rather than hands-on caregiving. In this respect, it is important to note that the outcome measures used in the previous analyses of long-term reciprocity were not restricted to intense transfers but covered a wide array of children's supportive activities (Henretta et al., 1997; Silverstein et al., 2002). Specifically, Henretta et al. (1997) operationalized children's support by a dichotomous measure covering occasional practical help as well as hands-on caregiving.

As discussed above, the principle of equity only applies to the long-term definition of parent–child reciprocity, whereas short-term reciprocity was argued to be associated only with intense time transfers for which frail parents usually cannot offer proportional repayments. In view of this distinction, we propose that a more differentiated consideration of support intensity provides insight into the linkage between long-term and short-term reciprocity across the family life course.

A linkage between long-term and short-term reciprocity?

As mentioned above, a sociological perspective on support exchange understands late-life patterns of intergenerational transactions within families as evolving from the history of relationships between each sibling and their parents. This view suggests a *sequential dependence* of long-term and short-term reciprocity. That is, parent–child reciprocity operates both longitudinally and contemporaneously, each temporal pattern corresponding to a specific purpose: Long-term reciprocity functions as a within-family selection mechanism exogenous to a child's initial support whereas concurrent reciprocation responds to selected children's stress and burden, easing the caregiving relationship.

Based on the above discussion of intra-generational orientation on equity, we propose two models of this sequential process. The first is based on previous accounts positing that long-term reciprocity determines the "[s]election of children to provide care" (Henretta et al., 1997, p. 110). This view is consistent with a *one-step* (*direct*) linkage between long-term and short-term reciprocity: Among siblings, those who have received more in previous life assume caregiving responsibilities to a frail parent whereas those who received less do not. Note that this account is intrinsically based on the assumption that orientation on equity is *inter*-generational. Caregiving thus constitutes an equitable repayment of earlier parental support, although the "selected" child assuming the caregiver role is likely to overcompensate for previous differences between siblings' support accounts (see Fig. 1). Short-term reciprocity, in turn, ensues as an exchange arrangement disburdening the caregiving relationship between the parent and the selected child.

A related specification of a sequential dependence of long-term and short-term reciprocity posits a *two-step* (*indirect*) linkage. This idea is based on an analytical separation between caregiving and instrumental help (e.g., Brandt, Haberkern, & Szydlik, 2009). The latter category includes activities that are not related to bodily care, such as aid with shopping, transportation, and household tasks. To an aging parent, this type of assistance is less reflective of dependency on the child; to an adult child, instrumental help is, on average, less demanding, less time-consuming and therefore less associated with stress and burden (Walker & Pratt, 1991; Walker, Pratt, & Eddy, 1995). If orientation on equity is intra-generational, an adult child's selection into instrumental help may constitute an equitable repayment

relative to siblings who received less parental support in previous life: Once a parent starts to require instrumental help, long-term reciprocity influences the selection of an initial helper among siblings. An initial helper, in turn, may be more likely to become a caregiver once parental need intensifies (Walker & Pratt, 1991). Some empirical evidence for the latter assumption exists, suggesting that aging parents are more likely to expect future caregiving from those children who already provide assistance (Pillemer & Suitor, 2006).

Note that in contrast to the direct linkage model, this specification comprises two steps, initial selection into help and subsequent transition into care, of which only the first is related to long-term reciprocity. Short-term reciprocity, however, is predicated on the onset of caregiving, requiring that the second step is complete. In this model, both temporal patterns of exchange are thus interrelated only to the extent to which initial helpers become later caregivers.

Taken together, these models of (direct or indirect) sequential dependence suggest that despite its different temporal shapes, reciprocal exchange is distinctly structured within families across the life course. That is, earlier patterns of giving and receiving translate into later patterns, reinforcing reciprocal exchange within specific parent–child dyads, as opposed to others. Thus, children who have repaid long-term support debts to parents are likely to be those who are subsequently involved in arrangements of short-term reciprocity (Hypothesis 1).

However, the idea of an intra-generational orientation on equity leaves room for an alternative view, suggesting the absence of a linkage and thus, *sequential independence* of long-term and short-term reciprocity (Hypothesis 2). According to this account, long-term reciprocity influences the selection of an initial helper — similar to the model proposing a two-step (indirect) linkage. The supporting child, however, does not overcompensate by investing far beyond what is necessary to restore the support balance relative to siblings. Once requirements for parental support become more demanding, responsibilities may be renegotiated among siblings (Finch & Mason, 1993). Consequently, long-term reciprocity might not bear on the process by which an adult child becomes a caregiver to an infirm parent. The latter may rather be viewed as a separate process. In this respect, compelling evidence exists on alternative models that conceptualize caregiving as *unconditional*, need-driven support governed, for instance, by altruism. According to the economic literature, altruistic children derive utility from supporting parents and thus respond readily to their need. The sociological equivalent to the altruistic motive is the norm of filial responsibility (Silverstein, Gans, & Yang, 2006). This norm is commonly regarded as a generalized expectation that children should support their parents when need arises (Gans & Silverstein, 2006). Because adult children internalize this norm, they feel obliged to help their parents irrespective of previous reception of parental support and without the expectation of future compensation. A related account highlights the importance of intergenerational attachment and relationship quality, rather than adherence to certain norms, as a motive to unconditionally support a parent (Collins & Feeney, 2000; Stuifbergen, Dykstra, Lanting, & van Delden, 2010).

For the empirical analysis, it is important to consider a number of other characteristics that have been found to influence sibling negotiations of responsibilities toward frail parents. In this regard, the work of Finch and Mason is particularly informative. Their concept of legitimate excuses (Finch, 1989; Finch & Mason, 1993) highlights specific conditions that may be regarded as acceptable reasons for not committing to family responsibilities. Among these conditions,[3] our data include only information on a number of relevant sociodemographic factors. First, sisters are mostly seen as more competent providers, as roles of helpers and caregivers are commonly considered "female" and thus more compatible with women's gender identity (Aronson, 1992; Matthews, 1995). Second, marital status indicates competing demands of an own family. Commitments to spouses and young children are considered legitimate reasons for reducing or avoiding involvement in parental care (e.g., Dwyer & Coward, 1991; Laditka & Laditka, 2001). Finally, lack of personal resources (indicated, for instance, by educational attainment) is frequently mentioned as an excuse for being unable to support an aging parent (Finch & Mason, 1993).

Methods

Sample

We used data from Wave 1 (1993) of the AHEAD study comprising 8222 non-institutionalized individuals aged 70 and over (i.e., born 1923 or earlier). The AHEAD is closely linked to the Health and Retirement Study (HRS) which was started in 1992 as a longitudinal household survey of older persons in the United States. The AHEAD data were particularly well suited to address our research questions because they included parents' retrospective reports on earlier financial transfers given to children within the past 10 years as well as information on more recent transfers from the past 12 months. Although AHEAD and HRS are panel studies, case numbers of respondents observed across two or more waves were not sufficient to study caregiving within families over time, including transitions from help to care under this study's sample restrictions.

Following Henretta et al.'s (1997) analysis of these data, we restricted the sample to respondents who were living without a partner, had between 2 and 10 living children, and were "at risk for care". The first restriction to single-living respondents removed 4460 individuals, focusing the analysis on elderly persons among whom, in the absence of a partner in the household, assistance from adult children was especially important. The second restriction, excluding further 1419 cases, was motivated by a within-family perspective that examines differences between siblings. Estimation of fixed-effects models requires at least two children per respondent and within-family variation in child characteristics (see below). The third restriction was based on the "risk for care" definition employed by Henretta et al. (1997), removing another 1307 individuals. This exclusion restricted the sample to those who satisfied at least one of the following criteria: (1) receiving help; (2) using equipment (e.g., cane, walker, or wheelchair); and (3) experiencing health-related difficulties in

[3] Further important excuses cited in the work of Finch and Mason (1993) are employment and geographical distance.

performing activities of daily living (ADLs) or instrumental activities of daily living (IADLs). Finally, we removed further 26 respondents who did not report on the receivers of transfers. After all restrictions, our analytic sample consisted of 1010 single-living frail parents with at least two children (12.3% of original sample size), comprising 3768 parent–child dyads.

Measures

We used five measures for intergenerational transfers in the multivariate analyses (see Table 1). First, we replicated both transfer measures used by Henretta et al. (1997: 113) to investigate long-term reciprocity. Earlier financial transfers from parents to children were measured by a dichotomous indicator focusing on financial gifts of a greater size given within a 10-year window before data collection. This indicator was coded one if the parent answered positively to at least one of the following questions: (1) "In the past 10 years did you [or your (husband/wife/partner)] give a child (or grandchild) a deed to a house?; and (2) "Please think about the past 10 years. Not counting any shared housing or shared food, have you [and your (husband/wife/partner)] given financial help or gifts, including help with education, of $5000 or more to any child (or grandchild)?"

Affirmative responses were followed up by questions on the names of children or grandchildren who received the

Table 1
Descriptive statistics and variable descriptions, AHEAD 1993 (n = 1010 respondents; n = 3768 parent–child dyads).[a]

Variable	M	SD	Range	Description
Characteristics of respondents				
Male	.17			
Age	80.67	6.76	69–103	
Number of children	3.73	1.97	2–10	
Health problems with instrumental activities of daily living (IADLs)	1.44	1.50	0–5	Number of IADLs a respondent needs help with or does not do because of health problems; IADLs: preparing hot meals, grocery shopping, using a telephone, taking medications, and managing money
Health problems with activities of daily living (ADLs)	1.91	1.68	0–6	Number of ADLs for which a respondent is receiving assistance or using special equipment or having difficulty performing; ADLs: bathing, dressing, eating, toileting, bed transference, and walking across a room
Characteristics of children				
Male	.49			
Age	50.89	9.75	11–84	
Married	.65			Coded 1 if the child is married; 0 if the child is single, cohabiting, divorced, or widowed
Education	12.25	2.96	0–17	Education measured in years: 0 No formal education; 1–11 grades; 12 high school; 13–15 some college; 16 college grad.; 17 post college
Transfer behavior				
Parent gave large financial transfer (past 10 years)				
Dyadic level	.07			Coded 1 for parent–child dyads in which the parent gave a deed to a house and/or financial help or gifts, including help with education, of $5000 or more to the child (or child's spouse, or grandchild) in the past 10 years; not counting any shared housing or shared food
Family level	.15			Coded 1 if the corresponding dyadic indicator equals 1 in at least one dyad within the family
Parent gave financial transfer (past 12 months)				
Dyadic level	.06			Coded 1 for parent–child dyads in which the parent or his or her spouse/partner gave a financial transfer of at least $500 to the child (or child's spouse, or grandchild) in the past 12 months
Family level	.13			Coded 1 if the corresponding dyadic indicator equals 1 in at least on dyad within the family
Parent received help (past 12 months)				
Dyadic level	.15			Coded 1 for parent–child dyads in which the child, the child's spouse/partner, or one of the child's children are among the two persons who most often helped with IADLs in the past 12 months
Family level	.48			Coded 1 if the corresponding dyadic indicator equals 1 in at least on dyad within the family
Parent received care (past 12 months)				
Dyadic level	.03			Coded 1 for parent–child dyads in which the child, the child's spouse/partner, or one of the child's children most often helped with at least one of the six ADLs in the past 12 months
Family level	.11			Coded 1 if the corresponding dyadic indicator equals 1 in at least on dyad within the family
Parent received help and/or care (past 12 months)				
Dyadic level	.17			Coded 1 for parent–child dyads in which at least one of the above indicators (help or care) equals 1
Family level	.51			Coded 1 if the corresponding dyadic indicator equals 1 in at least on dyad within the family

[a] Sample of unmarried parents of 2 to 10 children who were "at risk for care" (i.e., received assistance and/or used special equipment and/or had difficulty performing any of the ADLs and/or had difficulty performing any of the IADLs and/or not performed these activities because of a health problem).

transfers. If the recipient was a grandchild, the transfer was indexed to his or her parent (i.e., one of the respondent's children). A second dichotomous indicator was used to measure time transfers received from children. This variable was coded one for dyads in which the child provided assistance with ADLs and/or IADLs in the past 12 months. Those who assisted with ADLs (bathing, dressing, eating, toileting, bed transference, and walking across a room) were identified as follows. First, respondents reported on each of the six ADLs whether anyone ever helped them to perform that activity during the last year. Positive responses were followed up by a question on how often they received help. Only if it was received "most of the time", a specific helper was identified by the question of "who most often helps?" In the cases of assistance with IADLs (preparing hot meals, grocery shopping, using a telephone, taking medications, and managing money), the AHEAD survey used a different strategy to identify helpers. Respondents who reported on any level ("most of the time, some of the time, only occasionally") of receiving assistance with at least one of the IADL tasks were asked to name the two persons that most often helped. Both for assistance with ADLs and IADLs, time transfers were indexed to the respondent's respective child if the helper was a child in law or a grandchild.

The indicator for time transfers covered a wide range of support activities. Testing our hypotheses, however, required more differentiated measures of children's time transfers. In this respect, the above definitions of ADL and IADL helpers provided a straightforward rationale to generate an indicator for "burdening" time transfers related to bodily care as well as an indicator for less-demanding support unrelated to bodily care. According to the AHEAD identification strategy, an ADL helper was the person who *most often* helped with one or more tasks related to *bodily care*. In addition, a helper was only named if the parent was in *great need* of support, receiving assistance most of the time when performing the activity. In contrast, persons named as IADL helpers were not necessarily the primary providers of support and their activities did *not* involve hands-on caregiving. Furthermore, identification of these helpers was not restricted to situations in which the respondent required assistance most of the time, but also if support was received only occasionally or some of the time. Based on these considerations, we divided the time transfer measure used by Henretta et al. (1997) into two additional indicators. The first ("care") was coded one for dyads in which the child was named as the person who most often assisted with at least one ADL. The second ("help") was coded one for dyads in which the child was among the two named persons who helped with at least one IADL.

Finally, we used an indicator for parents' financial transfers of more than $500 that were given to a child in the past 12 months. This measure concerned the analysis of short-term reciprocity that required consideration of downward (i.e., parent-to-child) financial transfers from the same recall period as upward time transfers (Leopold & Raab, 2011, p. 110). Again, transfers given to children-in-law or grandchildren were indexed to the respective child of the respondent.

All models controlled for a common set of socio-demographic covariates at child level including age, gender, marital status, and education (see Henretta et al., 1997). The share of missing data on these covariates was 0.6% for gender, 4.1% for age, 1% for marital status, and 6.1% for years of education. Before conversion into dyadic data, we imputed missing values on these covariates using a background model that included all variables from the multivariate models and a number of auxiliary variables at family level. We used multiple imputation by a sequence of chained equations (Royston, 2009; van Buuren, Boshuizen, & Knook, 1999), generating ten estimates for each missing value. In the multivariate models, parameter estimates and standard errors were calculated by Rubin's rules (Rubin, 1987). In contrast to single imputation, this procedure adjusts for the fact that imputation involves uncertainty with regard to the missing values and avoids underestimation of standard errors by taking into account the variation between and within imputations.

Fixed-effects models

We used fixed-effects conditional logit models to investigate patterns of reciprocal exchange within families. Because this analytical strategy focuses on differences between siblings, estimates are only obtained for characteristics that vary among them. As noted in the background, there are two important advantages of a fixed-effects approach for the purpose of the present study. First, it controls for unobserved factors at family level. A shared family culture to unconditionally support one another, for instance, may govern intergenerational transfers in both directions. If this is the case, the omitted variable is correlated with predictors and outcomes, potentially leading to biased estimates. In fixed-effects models, all characteristics (observed and unobserved) that are constant within a family drop out of the estimation equation and do therefore not affect the estimates. Second, fixed-effects models are well suited to analyze intra-family processes (Silverstein, Conroy, & Gans, 2008). As discussed, intra-generational orientation on equity in the process of negotiating responsibilities to help and care among siblings implies that previous support received equally by each child is disregarded. A fixed-effects approach corresponds well to this idea because parents' "baseline amount" of support is a factor shared among siblings and thus conditioned out of the models (see Fig. 1).

The fixed-effects models are presented in Tables 2, 3, and 4. These models are organized as follows. First, we reproduced the multivariate model estimated by Henretta et al. (1997, p. 117) to investigate long-term reciprocity within families (Model 1, Table 2). This model represents the baseline specification for all subsequent models in the sense that these models share a common set of covariates and vary only with regard to the transfer measures used. In the remaining models from Table 2, the outcome variable is replaced by the more differentiated outcomes "help" (Model 2) and "care" (Model 3). These models pertain to the concept of intra-generational orientation on equity, testing whether the effect of earlier parental transfers varied with regard to the distinction between help and care.

The second set of models, presented in Table 3, tests for short-term reciprocity. Analogous to the previous models, we used time transfers as outcome measures in Models 4, 5, and 6. Model 4 is specified in the same way as Model 1 except that earlier financial transfers are replaced by current financial transfers as a predictor of children's support. Similar to the first

Table 2
Conditional logistic regression results for receiving help and/or care, AHEAD 1993.[a]

	Parent received help and/or care (past 12 months)		Parent received help (past 12 months)		Parent received care (past 12 months)	
	Model 1		Model 2		Model 3	
	B (SE)	Odds ratio	B (SE)	Odds ratio	B (SE)	Odds ratio
Long-term reciprocity						
Parent gave large transfer (past 10 years)	1.10**	3.01	1.14**	3.14	0.58	1.79
	(0.37)		(0.39)		(0.74)	
Characteristics of child						
Age	−0.02*	0.98	−0.02*	0.98	−0.04†	0.96
	(0.01)		(0.01)		(0.02)	
Male	−1.01***	0.36	−0.93***	0.39	−1.60***	0.20
	(0.11)		(0.12)		(0.31)	
Married	−0.51***	0.60	−0.46***	0.63	−0.82**	0.44
	(0.12)		(0.13)		(0.28)	
Years of education	0.04	1.04	0.03	1.03	0.08	1.09
	(0.03)		(0.03)		(0.07)	
χ^2	134.01		109.13		55.84	
df	5		5		5	
Pseudo R^2	0.09		0.08		0.19	
Number of parent–child dyads	2033		1953		460	

† $p < .10$.
* $p < .05$.
** $p < .01$.
*** $p < .001$.
[a] See Table 1 for details on measures; standard errors (SE) in parentheses.

set of models from Table 3, the remaining models separately predict the differentiated outcome variables "help" and "care".

The final set of models, shown in Table 4, tests our contrasting hypotheses, including both earlier and current financial transfers from parents as predictors of time transfers received from children. Again, initial estimation of the broad outcome measure of time transfers (Model 7) is complemented by more differentiated models for help (Model 8) and care (Model 9).

Results

Descriptive analysis

Table 1 presents a descriptive overview of the sample and all measures used in the analyses. As a result of our sample restrictions, male respondents were underrepresented; average age and number of surviving children were at relatively high levels compared to the full sample of AHEAD; and health

Table 3
Conditional logistic regression results for receiving help and/or care, AHEAD 1993.[a]

	Parent received help and/or care (past 12 months)		Parent received help (past 12 months)		Parent received care (past 12 months)	
	Model 4		Model 5		Model 6	
	B (SE)	Odds ratio	B (SE)	Odds ratio	B (SE)	Odds ratio
Short-term reciprocity						
Parent gave financial transfer	1.14**	3.14	0.97*	2.63	1.70*	5.47
(past 12 months)	(0.43)		(0.43)		(0.77)	
Characteristics of child						
Age	−0.02†	0.98	−0.02*	0.98	−0.04†	0.96
	(0.01)		(0.01)		(0.02)	
Male	−1.01***	0.36	−0.93***	0.39	−1.58***	0.21
	(0.11)		(0.12)		(0.31)	
Married	−0.52***	0.59	−0.46***	0.63	−0.91**	0.4
	(0.12)		(0.13)		(0.29)	
Years of education	0.05†	1.05	0.04	1.04	0.1	1.11
	(0.03)		(0.03)		(0.07)	
χ^2	131.98		105.24		60.53	
df	5		5		5	
Pseudo R^2	0.09		0.08		.21	
Number of parent–child dyads	2033		1953		460	

† $p < .10$.
* $p < .05$.
** $p < .01$.
*** $p < .001$.
[a] See Table 1 for details on measures; standard errors (SE) in parentheses.

Table 4
Conditional logistic regression results for receiving help and/or care, AHEAD 1993.[a]

	Parent received help and/or care (past 12 months)		Parent received help (past 12 months)		Parent received care (past 12 months)	
	M7		M8		M9	
	B (SE)	Odds ratio	B (SE)	Odds ratio	B (SE)	Odds ratio
Reciprocity						
Long-term Parent gave large transfer (past 10 years)	0.95* (0.38)	2.58	1.04** (0.40)	2.83	0.18 (0.79)	1.20
Short-term Parent gave financial transfer (past 12 months)	0.92* (0.44)	2.52	0.79† (0.44)	2.19	1.66* (0.79)	5.26
Characteristics of child						
Age	−0.02† (0.01)	0.98	−0.02* (0.01)	0.98	−0.04† (0.02)	0.96
Male	−1.01*** (0.11)	0.36	−0.93*** (0.12)	0.39	−1.58*** (0.31)	0.21
Married	−0.52*** (0.12)	0.59	−0.46*** (0.13)	0.63	−0.90** (0.29)	0.41
Years of education	0.04 (0.03)	1.05	0.03 (0.03)	1.03	0.10 (0.07)	1.10
χ^2	138.55		112.34		60.59	
df	6		6		6	
Pseudo R^2	0.10		0.08		0.21	
Number of parent–child dyads	2033		1953		460	

† $p < .10$.
* $p < .05$.
** $p < .01$.
*** $p < .001$.
[a] See Table 1 for details on measures; standard errors (SE) in parentheses.

problems with ADLs and IADLs were widespread. The proportion of transfers given and received is presented at family level and at dyad level. The family level measure represents the proportion of families in which at least one transfer was recorded whereas the dyadic indicator was calculated by the total number of transfers divided by the number of dyads. Approximately every second parent received help or care from at least one child in the past 12 months and about 16% of all children provided such assistance. The separate measures for help and care indicate that the former represents the predominant type of support that parents received. Downward financial transfers of greater size were given in 15% of all families within the past 10 years; among all children, approximately 7% received this type of parental support. Fairly similar numbers were found with regard to downward financial transfers of $500 or more given in the past year.

Multivariate analysis

Test for long-term reciprocity

Model 1 (Table 2) shows that we were able to reproduce the main finding from the study by Henretta et al. (1997, p. 117). Children who received large parental gifts in the past 10 years were more likely to give time transfers to a frail parent. Previous financial transfers from parents emerged as a key predictor of siblings' selection into time transfers, as the marginal effect of this indicator was no less important than the child's gender in estimating the propensity of providing support. Models 2 and 3, however, provide a critical qualification to this result, revealing marked differences with respect to the type of time transfer. The findings from these models suggest that children's long-term repayments to parents take the form of help rather than care.

Test for short-term reciprocity

The results on short-term reciprocity, shown in Table 3, are similar to those obtained from European data of the SHARE (Leopold & Raab, 2011). Giving money to a child tripled the odds of receiving assistance from that child within the same year (Model 4). As suggested by the concept of short-term reciprocity, these patterns were distinctly related to the intensity of children's support, emerging most clearly if the child was a primary caregiver (Model 6). Note, however, that compared to the findings on long-term reciprocity, differences with regard to the help-care distinction were not as clear-cut. That is, although short-term reciprocity was most strongly associated with caregiving, it was also present if the child only provided help (Model 5).

Test for sequential dependence

Despite the evidence for long-term and short-term reciprocity in Tables 2 and 3, these results were already inconsistent with Hypothesis 1, positing a sequential linkage between both patterns of reciprocal exchange. As expected, short-term reciprocity was associated with caregiving. However, earlier parental transfers predicted a child's selection into providing help rather than care, contradicting the model of a one-step, direct linkage. Importantly, even if selection into help was the precursor to caregiving (two-step, indirect linkage), earlier parental transfers should still have predicted caregiving, even though the transition from help to care could not be observed from these cross-sectional data.

The models presented in Table 4 explicitly tested our competing hypotheses on the linkage between long-term and short-term reciprocity. The rationale behind this set of models was as follows: Suppose that infirm parents gave concurrent financial reciprocation to those children who

provided time transfers. In a within-family fixed-effects model for time transfers, current financial transfers from parents would therefore "predict" the outcome. If those children who provided assistance were selected on earlier parental transfers, the latter would represent an omitted variable that correlated both with the predictor and the outcome. In this case, the effect of parents' current financial transfers on receiving time transfers should decrease markedly after the inclusion of information on earlier giving. That is, the effect of the current distribution of financial transfers among adult children would be explained, to a certain extent, by earlier patterns. Considering our hypotheses, this result would support Hypothesis 1, indicating that long-term and short-term reciprocity were sequentially linked, either directly or indirectly via instrumental help. In the absence of a linkage (Hypothesis 2), instead, earlier patterns would not explain the current distribution of financial transfers.

The findings from Table 4 provided strong support for Hypothesis 2, thus rejecting the model of sequential linkage posited by Hypothesis 1. Model 7, including both indicators of reciprocity simultaneously, shows that compared to Model 4, the effect of current financial transfers decreased only slightly when controlling for the distribution of earlier transfers among siblings. The comparison of Model 2 with Model 8 and of Model 6 with Model 9 further highlights the lack of evidence for Hypothesis 1, showing that simultaneous inclusion of the indicators for long-term and short-term reciprocity did not markedly change their coefficients. In short, the former predicted help whereas the latter was primarily associated with caregiving.

The results on the covariates were consistent with the literature on intergenerational transfers. Daughters were more likely to support their parents than sons, in particular with regard to caregiving. Those who were married – an indicator for competing demands – had lower propensities of assisting their parents. Again, the difference was more pronounced in the models predicting care. Education is a more ambiguous proxy, possibly indicating both higher opportunity costs of supporting parents as well as personal resources that may increase availability. In our analysis, education did not affect a child's propensity of assisting an infirm parent. Finally, the age effect shows that within families, older children were less likely to provide support than their younger siblings.

Discussion

This article proposed a common framework for analyzing different temporal shapes of reciprocal exchange in parent–child relationships. Drawing on basic principles from social exchange theory, we took a within-family approach, assessing whether long-term and short-term reciprocity operated either as interdependent mechanisms that initially selected and subsequently relieved intergenerational caregiving relationships (sequential dependence) or as separate processes (sequential independence). Data from AHEAD on previous and current transfers allowed considering current patterns of late-life support exchange in families as well as their historical antecedents, measured by large parental transfers given to children within the past 10 years.

Using fixed-effects models, we were able to reproduce previous findings on long-term reciprocity (Henretta et al., 1997) and on short-term reciprocity (Leopold & Raab, 2011). The results, however, did not support Hypothesis 1 which posited either a direct or an indirect sequential linkage between both temporal patterns of parent–child reciprocity. Instead, the intensity of adult children's time transfers, operationalized by the distinction between instrumental help and care, emerged as the key feature that separated long-term from short-term reciprocity. Our findings indicated, first, that children who were overbenefited with regard to previous parental support were more likely than their siblings to provide instrumental help, but not hands-on care. These results were broadly consistent with an intra-generational orientation on equity, suggesting that children might not repay proportionally to prior parental investments but balance support accounts relative to their siblings. Second, short-term reciprocal exchange was primarily associated with caregiving (i.e., children's intense time transfers). Overall, these findings were in line with Hypothesis 2 which stated that within-family selection of a caregiver is influenced by factors other than long-term reciprocity.

Although our data did not allow testing alternative models of caregiver selection directly, even the few covariates included in our estimation pointed to a number of relevant factors. Married children, for example, were generally less likely to support their parents and in particular to provide care. This finding is consistent with previous research (e.g., Dwyer & Coward, 1991), indicating how competing demands, in this case an own family, constrain the time available for providing intergenerational assistance. The issue of availability and structural constraints also pertains to the marked gender differences which emerged as a key predictor of support provision, again particularly with regard to caregiving.

There are several limitations to this study. First, we had to rely on parental reports of earlier and current transfer behavior. These data do not allow tracing continuity and change in the patterns of intergenerational transfers. Most notably, we were unable to examine transitions from intergenerational help to caregiving. Although AHEAD and the associated HRS are panel studies, case numbers under the sample restrictions of the present study were not sufficient to use a longitudinal approach. A further limitation in this regard is that our retrospective data did not permit a comprehensive reconstruction of the history of family transfers across the life course. A large financial transfer to a child observed within the past 10 years, for instance, could compensate for transfers given to other children prior to our window of observation. Moreover, our indicators for financial transfers in the short-term (the past year) and long-term (the past 10 years) were not mutually exclusive, introducing some uncertainty with regard to their temporal ordering. However, as survey questions about transfers from the past year are phrased in the present whereas those about earlier transfers are phrased in the past tense, the wording structure is likely to yield the presumed temporal ordering (Henretta et al., 1997, p. 118). Despite their drawbacks, the retrospective data we exploited still provided valuable longitudinal information that allowed testing basic hypotheses about the presence or absence of a linkage between long-term and short-term reciprocity. Namely, the presence of a sequential linkage is predicated on the assumption that between-sibling differences in earlier receipt of parental support are predictive of their later selection or non-selection into caregiving. In this respect, the patterns we found

suggested a distinctive structure that is unlikely to be observed if long-term and short-term reciprocity were sequentially linked.

Second, our analysis relied on dichotomous transfer variables. A more accurate depiction of how siblings actually divide responsibilities would require more differentiated information on each child's contributions. Our measures reflected the rather simplistic view that certain children occupy the role of a helper or caregiver whereas others do not. The recent literature, however, has highlighted that informal help and care are often shared among siblings (Davey & Szinovacz, 2008). Consequently, between-sibling variation would be better captured by a design that allows identifying more than one or two helpers and includes gradual rather than dichotomous measures of each child's contributions. With regard to intra-generational orientation on equity, we further note that we had to infer negotiations among siblings on which we lacked direct information.

Third, our models controlled for relatively few factors at child level. Despite the obvious benefits of using fixed-effects models to deal with unobserved heterogeneity, omitted variable bias may still exist if unobserved characteristics that vary between parent–child dyads within a family were correlated with predictors and outcomes. Examples are geographical distance, the extent to which children endorse norms of obligation toward parent care (Gans & Silverstein, 2006), and intimacy in parent–child relationships (Schwarz, 2006). Our models, however, would hardly benefit from cross-sectional information on these characteristics because it would remain unclear if they were exogenous or endogenous to supportive exchanges (Henretta et al., 1997, p. 118).

In conclusion, our joint investigation of two temporal patterns of parent–child reciprocity did not yield empirical evidence in support of a linkage between earlier and later exchange relationships within families. Although our findings are far from conclusive, we see three important analytical contributions of the present study. First, our analyses strongly suggest that studies of intergenerational exchange should distinguish carefully between different types of children's time transfers. Short-term reciprocity has already been proposed as a disburdening arrangement primarily associated with time-consuming assistance. Analysts of long-term reciprocity, in contrast, did not explicitly consider different levels of time transfer intensity. As already noted by Walker et al. (1995) and corroborated by the present study's results, measures that subsume various activities under the category of "time transfers" may mask important differences.

Second, choosing a within-family approach yields analytical benefits both at the theoretical and at the empirical level. Existing studies often concentrate only on the latter, stressing the advantages of within-family models in dealing with unobserved heterogeneity. We consider it worthwhile, however, to reach beyond this view and reconsider existing theoretical models of transfer behavior in light of a within-family perspective. The model of intra-generational orientation on equity – focusing on how children evaluate long-term support obligations relative to siblings instead of parents – is an attempt to move in this direction.

Third, at a more general level, the present investigation has demonstrated the benefits of replication for developing, testing, and revising important theoretical ideas such as parent–child reciprocity. In reproducing the results of Henretta et al. (1997), on the one hand, we promoted confidence in the reliability and integrity of their study. In challenging and extending their study both theoretically and empirically, on the other hand, we were able to determine its scope and limits, providing an important qualification to the original interpretation of long-term reciprocity.

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