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The Safety Nest: A Model of Family Coresidence

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Abstract

This analysis uses linked sibling data from the 1979 National Longitudinal Survey of Youth (NLSY79) to investigate the presence of a relationship between young adult and elderly coresidence within families. I find that children who departed late or returned to the parental home are more likely to have coresident parents later in life, such that even within a given family, parents requiring coresidence live with the child who exited later or returned. I present both linear and non-parametric models of this effect, and contextualize it with a mixed motivation behavioral model of intra-family generosity, which supports preferences consistent with these new facts. I show that neither altruism nor exchange alone can explain the intergenerational link in coresidence. The preferred model suggests that an increase in public aid to emerging young adults may decrease intra-family assistance to elderly individuals due to reduced signaling capacity, an important implication amid current policy discussions.

Keywords: Coresidence, parental transfers, altruism, old-age support

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1 Introduction

Parents can provide many forms of support to their children as they develop–for example, prenatal care, childhood health care, primary and secondary education involvement, and college financing. During the recent economic downturn, media outlets such as the *Chicago Tribune*, CNN, and the *New York Times* have highlighted an additional dimension to parents' support of children–prolonged coresidence and the "boomerang" phenomenon, in which adult children either continue to live with or move back in with their parents past the typical age of launching.

Over the last few decades, researchers have observed a delay in marriage, an increase in the frequency of parental coresidence, and an increase in financial transfers from parent to child (Glick, 1986; Furstenberg, 2010; Aquilino, 1990). No matter the cause, the traditional path to independence–school completion, full-time employment, independent housing, marriage, children–has lengthened and shifted over the last 30 years, resulting in a lower rate of marriage, a higher rate of extramarital childbearing, and longer and more frequent occurrence of adult children living with their parents (Settersten and Ray, 2010), suggesting that today's young people need more support from their parents than ever before.

However, young people are not the only generation requiring new forms of support. The United States and other developed nations have seen the simultaneous rise of the "sandwich" generation–the parents of the boomerang generation who face supporting not only their own children but also their aging parents, who may require transfers of time, money, or coresidence. Elaine Brody and Dorothy Miller originally developed the term "sandwich generation" to refer to individuals in their 40s and 50s facing these competing claims (Wassel, 2006). Now, individuals in their 60s and 70s are equally likely to be sandwiched, increasing the importance of understanding the underlying mechanisms. Although the literature has commented on the existence of increases in both coresidence by young adults and coresidence by aging parents, it has not yet posited a relationship between the two, leaving the benefit to those "sandwiched" a mystery. This paper will present empirical evidence of a link between these two forms of coresidence, contextualizing this finding with three competing models of coresidence behavior from the family transfers literature, with preliminary support for a mixed motivation behavioral model.

1.1 Motivation and previous work

While coresidence is related to processes within a family, it has key implications for those outside the home as well. When coresidence is used to smooth consumption, it takes the

place of government aid programs that are also intended to serve as a supplement in times of transition (e.g. Temporary Assistance for Needy Families). Coresidence can be an efficient way for family members to help each other, as joint residence permits consumption of an array of "public" goods, including housing, electricity, water, and potentially food and transportation. Identifying factors influencing coresidence among a broader cohort can help policymakers understand how government aid interacts with parental transfers (as suggested by Rosenzweig and Wolpin, 1994).

Children's coresidence also has implications for the welfare of the parent generation. Financial support results in a direct loss of disposable income, but coresidence may take a similar toll on parental happiness. Rosenzweig and Wolpin (1994) find that parents value privacy and prefer for their adult children to live independently, and parents with empty nests report higher marital satisfaction (White and Edwards, 1990). Bures (2009) finds that families with children (adult or otherwise) living at home are less likely to move than those with empty nests. Extending the launching process in this manner may delay the parent generation from being able to "downsize" or relocate for other reasons. The substitution of parental resources for governmental ones, therefore, is not without cost.

Furthermore, these costs may not be entirely private. Each coresident young adult is one not forming a new household, creating consequences for the rental and real estate markets. Figure 1 shows the fraction of young adults living with parents, and the homeownership rate among young adults. It is clear that these two factors are inversely correlated (see Figure 1): the homeownership rate drops as coresidence increases. Thus, understanding the factors that influence coresidence will aid in real estate market analysis.

Finally, one must consider the longer-term impacts of prolonged coresidence on those late to leave the parental home and on the parents housing them. Leopold (2012) finds that late home leavers maintain closer relationships with their parents, although it is unclear whether this is due to continued dependence or strengthened family ties. If parents receive future benefits in exchange for permitting extended coresidence, a comprehensive evaluation must include these components to accurately portray the intertemporal tradeoffs of coresidence. In addition, if children who "owe" their parents these future benefits (after leaving late or returning to the parental home) resist moving in order to pay their parents back in kind, there may exist mutually beneficial opportunities for cooperation or policy to improve efficiency.

Unless the underlying drivers of multigenerational coresidence–increased parental lifespan and challenges to labor market entry–reverse their trends, shared households are here to stay. In this paper, I present compelling empirical evidence that the phenomena of cores-

idence by parents and coresidence by young adults are related, and provide a model capable of generating insight into how changes in the provision of coresidence may impact the family decades later, with significant implications for governmental policy.

2 Data and Sample Characteristics

The full cohort of the 1979 National Longitudinal Survey of Youth (NLSY) is used for the analysis of sibling[1] departure ages as well as the analysis of young adult coresidence's correlation with elderly parent coresidence. The 1979 NLSY is a panel of almost 13,000 men and women born between 1957 and 1964 who have been surveyed annually from 1979 to 1994, and biennially after that. The most recent year of data is 2014.

The NLSY79 is advantageous due to the high accuracy of familial matches and broad coverage of topics. Questions range from basic demographics to financial practices, job history to sexual behavior, and drug use to political participation. For some categories of questions, participants are asked to recall monthly or weekly characteristics of their life over the last year. The interviews take less than 90 minutes, and participants (in early years, both the parent and the youth) were paid for their time.

2.1 Sample characteristics

As seen in the descriptive statistics presented in Table 1, of the 6,413 individuals in the sample, approximately a quarter are observed ever to have had coresident parents. This proportion increases if I limit the sample to those observed through later ages (e.g. 40). The average individual in the sample has completed high school and some college, scores slightly below the 50th percentile on the AFQT, and earns an average of 50,000 dollars between ages 30 and 45. The sample is equally divided between men and women, and about 30% are black, 20% are Hispanic, ad the rest are white or Asian. The average respondent has 3.8 siblings, exits the parental household just before age 22, and returns to the parental household, with a final exit at age 27. More than eighty percent of the sample has been married, with about half of those having been separated or divorced. About a quarter of the sample had a child before age 20, and just less than three quarters of the sample have biological children. The slightly lower fertility rates in the sample may be due to truncation during childbearing years, as these rates increase if I limit the sample to those observed through age 40.

[1]Many thanks to Joe Rodgers for creating and maintaining the NLSY sibling linkages.

2.2 Sample selection

The sample is limited by both structural factors and variable coverage. Due to the longitudinal nature of the NLSY, there is a large amount of attrition and missing information for the later waves. Although the Bureau of Labor Statistics attempts to survey every member of the original cohort, many original respondents have migrated or are otherwise out of contact, and two large oversamples–the military oversample and the poverty oversample–were dropped from active fielding in 1985 and 1991, respectively. Furthermore, the wave-like nature of the survey means that the respondents were at different life stages when first contacted in 1979. Consequently, approximately 5,000 of the respondents must be excluded from this analysis because they were born before 1960, as many of the members of this cohort would have already exited in 1979 and including only those respondents still coresident in 1979 would bias the sample.

Restricting the sample to individuals observed at least through age 30 (in order to have a chance of observing parents coresiding) drops another 1,000 respondents from the sample, and another 300 must be excluded because they are coresident for the duration of NLSY observations (thus, no age of exit can be recorded). This leaves a sample of 6,413 men and women, although in some regression specifications the sample will drop to 5,649 (due to missing birth order or fertility information). Additionally, the sibling sample is substantially smaller, consisting of approximately 2,700 respondents. Siblings were interviewed only if their ages fell within the sampling frame.

3 Econometric Model

This paper suggests that coresidence behavior by parents might be influenced by the launching behavior of children. In order to test this prediction, I take advantage of the longitudinal parent-child data in the NLSY. I model the incidence of elderly parents living with adult children as a function of those same children's coresidence behaviors that would have burdened parents during emerging adulthood:

$$\begin{aligned} Pr(\text{Parents Coreside with } i) = \beta_0 + \beta_1 \text{Child}_i \text{ Exited Late} + \beta_2 \text{Child}_i \text{ Returned} \\ + \beta_3 \text{Child}_i \text{ Demographics} + \beta_4 \text{Family Resources}_i + \epsilon_i \end{aligned} \tag{1}$$

Here, child demographics include gender, race, marital status, childbearing, and education. Family resources consist of the number of siblings of the child, the number of children of the child, and income quartile. In this way, I approximate the support network available to

the child's parents–children with more children of their own (for a given income) have fewer resources to share with parents, and parents with more children have more opportunities to draw resources. If either β_1 or β_2 is positive and significant in equation 1, I have preliminary evidence that coresidence by children is correlated with future coresidence by parents.

However, relating the two behaviors alone does not come close to establishing a causal link. Some families may have a general taste for living together, perhaps due to close ties or cultural norms. This would still manifest the phenomenon described above. Therefore, we need a more precise analysis, in which we difference out any family predisposition toward coresidence. I will estimate equation 1 again with a sample of siblings, including a family fixed effect. This "within-family" model will allow me to distinguish a general family taste for coresidence from a dyadic link in coresidence between parents and a particular child.

Unfortunately, even this approach does not generate sufficient identification for a causal claim. It is possible that parents have a favorite child, who is allowed more dependent behaviors (e.g., prolonged coresidence) and also is a preferred roommate should the parent(s) require coresidence. While the NLSY79 contains an extensive array of questions, I cannot identify a "favorite" or "most loved" child.[2] Nevertheless, it is important to understand any part of the increasingly prominent phenomenon of coresidence.

4 Empirical Results

In Table 2, I investigate the possibility of an exchange relationship through which parents permit inconvenient behaviors by the youth during emerging adulthood (delayed launches or returns) in exchange for future coresidence by the parent. In column 1, I present the correlation between late exits while controlling for a number of family background characteristics. Results suggest that exiting at 24 or older raises the probability of having future coresident parents by about 15 percentage points. In column 2, I present the correlation between returns and future coresidence, and find that returns to the parental home raise the probability of having coresident parents by about 27 percentage points. In column 3, I include both explanatory variables and find that they remain high significant, each raising the probability of coresident parents by at least 20 percentage points. This suggests that both home-leaving behaviors (delayed exits and returns) relate significantly to future parental coresidence.

[2]There are a small number of families in which some, but not all, children are sent to private school. This proxy for favoritism does not explain the dyadic pattern in coresidence mentioned above.

In Table 3, I model this relationship non-parametrically. There is an generally increasing trend in the likelihood of having coresident parents as the age of exit increases, suggesting that the linear approach is merited. In Table 4, I model these correlations separately for each income quintile, and find that these results are significant separately for each income group, although the model is most predictive for those in the middle range of incomes. In Table 5, I present how these results differ by race. I find the strongest relationship between parental coresidence and returns or late exits is found for non-white individuals, thought the relationship is significant for all racial/ethnic groups. The main finding is robust across specifications and subsamples.

In Table 6, I investigate the potential for a family "taste" for coresidence. The first column includes all respondents who are observed at least through age 40. Column 2 adds controls and family clustered standard errors, and Column 3 includes a family fixed effect. The family fixed effect allows for comparison between siblings–given different ages at exit, what is the probability that the parent chooses to live with the later exiting child? Parents are approximately 20 percentage points more likely to live with a child who exited after age 23, and approximately 30 percentage points more likely to live with a child who returned. Reassuringly, the sibling sample has similar coefficient magnitude and significance to the full sample, suggesting that the within-family result may be generalizable.

5 Models of Coresidence

There are a variety of behavioral explanations for the empirical evidence presented thus far. In order to interpret the correlation found, I will set forth two theoretical frameworks from the intra-family transfers literature, and discuss how the findings are contextualized by such models. I will also present a new "mixed motivation" signaling model, consistent with the emerging tendency to model intra-family support in this way.

To facilitate comparability across the three models (altruism, exchange, and mixed motivations) in this section, I will adapt all models to a generic framework. All models will represent these decisions as the behavior of the members of a two-generation, two-period game, where the child generation members are emerging adults (support from parents during childhood is taken as a given) and their parents comprise the other generation. I elect to use a two-period game in order to reflect the distinct timings involved in coresidence exchange.

I observe the education, income, residence, and fertility of the young generation, and the family linkages (siblings, parents, etc.) of these individuals. The young receive a stochas-

tic wage offer, low or high, and can choose whether to try[3] to continue coresiding with their parents or move out. In the second period, elderly parents receive an unobserved stochastic income, low or high, which is their only source of financial support (excluding in-kind services). The middle generation in each period (parents of young adults in the first period, children of elderly parents in the second) can choose to block or permit coresidence by either generation.

There is no opportunity for borrowing or saving in this model. Though T will be treated as continuous in all models, T could easily represent a continuous measure of parental generosity (perhaps through time transfers) with some threshold parameter $\bar{T}$ past which the generosity level is sufficient to permit coresidence, manifesting as the binary outcome observed.

In this model, parents pay a utility cost c for making transfers, they earn a benefit r, which is a function of the transfer to children, T_c, and they have some expectation of a transfer in the future, which is partly determined by the transfer they make to their children. Children also pay a utility cost c for transfers T_p made to parents, and earn a utility benefit θ for making transfers to parents, which depend on transfers made by parents in the first period.

The parent determines what transfer T_c to make to children in the first period in order to maximize his or her utility, U:

$$\max_{T_c} U = -cT_c + r(T_c) + E[T_p|T_c] \tag{2}$$

And in the second period, children determine what transfer T_p to make to parents to maximize their own utility:

$$\max_{T_p} U = -c(T_p) + \theta T_p(T_c) \tag{3}$$

5.1 Altruism

In the classical model of intra-family altruism proposed by Becker (1981), a benevolent wage-earner maximizes not just his/her own utility but also some weighted measure of another household member's utility. Essentially, the child's happiness is (a component of) the parent's happiness. Adapted to the coresidence framework, I have a parent maximizing his/her utility from consumption and some function of his/her child's utility, $\psi(U_c)$, wherein the

[3]Coresiding requires consent from the parents.

parent chooses T_c to transfer to the child as well as own consumption Z_p, and coresidence (d=1) is jointly determined:

With a coresident child (d=1), the parent's utility is given by

$$u_p = U(Z_p, d, \psi(U_c), T_c). \tag{4}$$

Without a coresident child (d=0), the parent's utility is

$$u_p = U(Z_p, \psi(U_c), T_c). \tag{5}$$

This setup has several important features:

- $\frac{\delta U_p}{\delta \psi(U_c)} > 0$ (parent is altruistic and gets utility from the child's consumption),
- $U_p|(d=0) > U_p|(d=1)$ (parents prefer independent living),
- $U_c|(d=0) > U_c|(d=1)$ (children prefer independent living)
- $\psi(U_c)$ is a monotonically non-decreasing function of U_c
- The parent's budget constraint is $Z_p + cT_c = Y_p$
- The child's budget constraint is $Z_c + (h(1-d)) = Y_c + T_c$, where h represents housing costs

Given that coresident children do not need to pay housing costs h, if a child's income is low enough, it is more efficient for the parent and child to live together than for the parent to subsidize the child through transfers, as this indirectly increases consumption for the child (by allowing the child to spend h housing cost on consumption instead of rent) and directly increases consumption for the parent (who no longer needs to transfer T_c out of his or her consumption budget).

Empirically, income potential tends to rise over time and peak between age 45 and 55, before dropping off rather sharply around retirement age. Logically, assuming the child's income potential (and thus consumption potential) is monotonically non-decreasing over time for the first 40 years of life, it is easy to see that coresidence is optimal early in life (e.g. during childhood and emerging adulthood when the child's income potential is low) and non-optimal later in life.[4]

[4]Parents with a lesser degree of altruism are more likely to stop permitting coresidence at a lower child income threshold, but the pattern will still hold.

If children are similarly altruistic toward their parents, altruism could explain parents moving in with children during later adulthood, should parent income (and thus consumption) fall below a certain threshold. Further, should economic circumstances (e.g. job loss during a recession) jeopardize the consumption of either party, coresidence may occur outside of these typical life cycle timings (as described in Kaplan, 2012).

While pure altruism can explain these coresidence behaviors individually, the multigenerational aspect suggests this altruism must be inherited. However, the results presented in the previous section additionally require that this altruism is selectively inherited.

5.2 Exchange

On the opposite end of the spectrum, the exchange hypothesis suggests that observed generosity is due to a "tit-for-tat" arrangement between parents and children, and not maximization of joint utility. Although the decision to have children itself is often viewed as an exchange to provide old-age security (Leibenstein, 1957; Nugent, 1985), this is perhaps less the case in developed nations with extensive savings and support networks for the elderly. Instead, I will take the decision to have children as external to our problem and focus instead on the parental decision to support children during emerging adulthood.

Parental utility is given as before in equations 4 and 5, except that $\frac{\delta U_p}{\delta \psi(U_c)} = 0$ (no altruism). Instead, parents use transfers and coresidence as an investment vehicle, optimizing over two periods by choosing how to support their children (T_c, d):

$$\max_{T_c, d_c} U_p = U_{p,t}(Z_p, d_c, T_c) + \beta U_{p,t+1}(Z_p, d_p(T_c, d_c), T_p(T_c, d_c)). \tag{6}$$

Exchange implies that the child's decision to provide T_p and coresidence, d_p, to a parent depends on the parent's provision of T_c and d_c to the child in the prior period. In their review of the intra-family transfer literature, Arrondel and Masson (2006) define exchange as "the implicit contract where (e.g.) parents trade prior education, or the promise of future inheritance, for children's support in their old age, [and] is expected to be mutually advantageous–if enforceable." Indeed, enforceability of this contract is the challenge, due to the distinct timings of each generation's need. If the link between children's late departures and parents' future coresidence were exchange, the system would require an additional mechanism to cause children to hold up their end of the bargain when it was their turn to provide housing, due to the distinctly separate timing of these events. A self-interested child would enjoy the benefits of coresidence and transfers during emerging adulthood, and renege on

the bargain with parents as they age. Rational parents would thus never provide transfers or coresidence in the first period.

Alternatively, this phenomenon could represent two sets of exchanges, where parents trade coresidence to children for simultaneous time transfers early in life, and then the children do the same with the parents later in life, but there is nothing to suggest that those two behaviors would be exhibited by the same individuals, so I cannot explain why child coresidence correlates with parental coresidence via exchange alone. Therefore, I will propose an alternative model that features characteristics of both altruism and exchange, requiring fewer assumptions about heterogeneity and gaining commitment on the part of the child generation.

5.3 Mixed motivation (behavioral)

The transfers literature has proposed several mixed models that feature elements of both models presented previously. Indirect reciprocity, also called retrospective altruism, describes the familial cycle of every parent generation providing goods or services to every child or elderly grandparent generation (Bevan and Stiglitz, 1980; Cox and Stark, 1996). This is not an exchange transaction, as there is not necessarily a two-way trade occurring, but the behavior also differs from altruism, and instead functions as a habituation or self-enforcing altruism mechanism. Cox and Stark refer to this as a demonstration effect that causes generations to repeat their parents' seemingly altruistic (or lack thereof) behavior.

In order to adapt these mixed motivation models to the distinct timing challenges of coresidence, I will adopt some enforcement mechanisms from the behavioral literature. It is generally accepted that parents care to some degree about their children, and it is not unreasonable to extend this to parents caring about what their children think of them. Rabin (1993) pioneered the approach of incorporating of social goals in economic modeling, following empirical work by Weisbrod (1988) and Train (1987). Rabin presents a model of fairness wherein agents are willing to sacrifice their own utility to punish or reward individuals for being unfair or fair, respectively.

This tendency to care about others' opinions has also been documented empirically (Arai et al., 2000), such as when individuals do not take advantage of welfare or other publicly available support, due to concern about "public face." In short, there is a long behavioral literature demonstrating that the way we behave toward other people is in part determined by what we think they think of us–their esteem for us.

Ellingsen and Johanneson (2007, 2008) propose a model of worker-employer relations in

which worker effort is affected by employer generosity, as this perceived employer generosity determines how much the worker cares about the employer's opinion of his effort level. In their model, beliefs about generosity and respect are determined in one period. For the purposes of my analysis, I adapt this framework of generosity and esteem to a two-period model where a child's esteem for his parent is not just generated by chance, but instead determined by that parent's previous generosity toward the child–in particular, by the parent's generosity in permitting extended coresidence. In other words, how I (the child) behave toward my parents is a function of what I think of them, because I only care about their opinion of me if I think highly of them.

Contributed Model

I model the behavior of the members of a two-generation, two-period game, where the child generation members are emerging adults (baseline support from parents during childhood is taken as a given), and their parents comprise the other generation. This model is a two-period signaling game in order to reflect the distinct timings involved in coresidence exchange. I will present a very simple model in which there are two types of parents and children–generous and ungenerous–who decide whether or not to provide residence to each other during two periods. I observe the education, residence, and fertility of the young generation, the income and family characteristics of the parent generation, and the family linkages (siblings, parents, etc.) among these individuals.

The young receive a stochastic wage offer, low or high, and can choose whether to continue coresiding with their parents or move out. In the second period, elderly parents receive an unobserved stochastic income, low or high, which is their only source of financial support (excluding in-kind services). The middle generation (parents in the first period, children in the second) can choose to block or permit coresidence by each generation.

In this model, I prohibit access to credit markets, which is logical for the young generation who are unattractive to lenders, and potentially plausible as well for the middle generation if the intra-family interest rate on the exchange of in-kind goods such as residence exceeds that of the market. As a consequence, there is no borrowing or saving.

The model is parameterized as follows:

- T_c represents the amount (of time or some other service) parents transfer to children, and T_p represents current valuation of future transfers from children to parents ;
- θ_c is child's type, θ_p is parent's type (private information at the start of the game):

  - For both generations, type 1 is "generous" and type 2 is "ungenerous"
  - $\theta_{c1} > \theta_{c2} > 0$ (generous children get more utility from generosity)
- $c_1 T_c$ is the total cost of transfers to children made by generous parents; $c_2 T_c$ is the total cost of transfers to children made by ungenerous parents; $c_2 > c_1$
- c(T_p) is the cost function for children;
- p(T_c) is the probability the child holds the parent in esteem given T_c ;
- r is the parent's valuation of child's esteem

Transfers are costly, but they increase the probability of being held in high esteem this period, which both types value. Transfers also affect the likelihood of future transfers from children (which depend on both child type and the child's esteem for the parent); that is:

$$\max_{T_c} U = -c_1 T_c + rp(T_c) + E[T_p | p(T_c), \theta_c] \qquad \text{if type 1 (generous);} \tag{7}$$

$$\max_{T_c} U = -c_2 T_c + rp(T_c) + E[T_p | p(T_c), \theta_c] \qquad \text{if type 2 (ungenerous).} \tag{8}$$

The child gets utility from transfers to the parent according to her type, but pays a cost c(T_p) for that transfer, with her problem being:

$$\max_{T_p} U = -c(T_p) + \theta_1 T_p p(T_c) \qquad \text{if type 1 (generous);} \tag{9}$$

$$\max_{T_p} U = -c(T_p) + \theta_2 T_p p(T_c) \qquad \text{if type 2 (ungenerous).} \tag{10}$$

Proposition 1*: There exists a separating equilibrium satisfying the Intuitive Criterion in which parent type is fully revealed by amount transferred to children, wherein ungenerous parents give T_c=0 and generous parents give $T_c^* > 0$.*

Proof The Intuitive Criterion (Cho and Kreps, 1987) tells us that because transfers are costly, ungenerous parents must select T_c=0 and, thus, p(T_c) must also be 0. Therefore, transfers from the generous parents must be just high enough that ungenerous parents are indifferent between faking generosity and choosing T_c=0.

In contradiction, suppose there exists a pooling equilibrium where ungenerous parents choose T_c such that they are believed to be generous, that is, such that p(T_c)=1:

$$\max_{T_c} U = Y_c - c_2 T_c + r*1 + E[T_p | 1, \theta_c] \qquad \text{if type 2 (ungenerous).} \tag{11}$$

Then $T_c^2 \leq \frac{r + E[T_p|1,\theta_c]}{c_2}$, so generous parents will choose $T_c^{1*} = \frac{r + E[T_p|1,\theta_c]}{c_2}$ (as utility is decreasing in transfer amount once esteem is established), and we again establish separation

by type (assuming that indifferent ungenerous parents choose to give nothing rather than fake generosity). However, this must mean that ungenerous parents will choose $T_c^{2*} = 0$.

Solving for the child's decision, because transfers are costly without esteem (remember if $T_c = 0$, $p(T_c) = 0$), ungenerous parents must then receive $T_p = 0$. Generous parents' transfer receipt depends on child type, with the child's problem becoming

$$\max_{T_p} U = -c(T_p) + \theta_1 T_p \qquad \text{if type 1 (generous);} \tag{12}$$

$$\max_{T_p} U = -c(T_p) + \theta_2 T_p \qquad \text{if type 2 (ungenerous),} \tag{13}$$

as $p(T_c) = 1$ if the parent is generous. Generous children will thus optimally give T_p such that c'(T_p)=θ_1, and ungenerous children will give T_p such that c'(T_p)=θ_2.

For the parents, the motivation to give is forward-looking, akin to Cox and Stark's demonstration effect. For the children, the motivation to give is backward-looking (as it depends on parent generosity), often called "retrospective" or "golden rule" generosity (Arrondel and Masson, 2001). This model features both esteem and exchange and most closely resembles a serial reciprocity model, in which good behavior is enforced through the family network (members care about other members' opinions as well as how that affects the likelihood of future transfers). It can be directly adapted to the coresidence framework by viewing T as a continuous measure of generosity (perhaps through time transfers), which has some threshold parameter $\bar{T}$ past which the generosity level is sufficient to permit coresidence.

This model also easily adapts to one in which T is offered and observed but not necessarily taken up, perhaps due to stochastic income draws. Individuals would still gain esteem for the offer of T, and future offers of T from children would depend on what the parental offer would be (regardless of use). The cost of offering T would decline (as a function of the probability of take-up), but the model would have identical predictions. Furthermore, this model can be adapted to allow the possibility of type inheritance, which would affect the expected value of generosity in the parent's utility function. For this model to be an accurate depiction of behavior, it requires that the incidence of generosity from parents (in this case, coresidence) is correlated with generosity from children, regardless of child's type. Furthermore, this model also provides a framework in which Cox and Stark's demonstration effect could enforce a family cycle of generosity, causing correlation in coresidence behavior across generations.

5.4 Limitations

Coresidence is a two-part decision (for both types)–observing it requires both that the householder offers it to the potential coresider (either parent or child), and that the coresider needs it. It is plausible that the family members have a prior on each other's generosity; that is, they know what the offer would be whether or not they need or take up coresidence. This is a problem for this analysis, as I observe only "used" offers. I am almost certainly underestimating the generosity from both generations, but one could argue that "making good" on the offer is a higher level of generosity, and that is what I am able to measure.

One concern for this analysis is that it may be the need for coresidence rather than the offer that is generationally correlated. In observing the young person's coresidence decisions (late exits/returns), I should be concerned about systematic differences in the need of coresidence that are inextricable from parental demonstrated willingness/generosity. However, I attempt to account for these systematic differences by approximating the individual's support network. To do this, I control for marriage and household income (two earners are less likely to need parental support), age at first birth (potentially a disruption to employment/education), and number of biological children (tighter budget constraint for a given income).

Although some geographic data are available in the NLSY, I do not observe residential location specifically enough to incorporate local labor market characteristics (of both the parent and child). Thus, I would be concerned about the situation where a youth needs coresidence because of an economy-driven job loss, but the parents are unable to provide coresidence due to foreclosure on their house or loss of income (though they are willing). This correlation between need and take-up could cause me to be under-observing generosity, which could potentially bias my estimate in the main regression specification. This would cause me to underestimate the magnitude on "returns," because there is generosity in the family that is unobserved, and economy-driven job loss blocking the visibility of generosity could also cause the parent to need coresidence later in life. However, that would mean that what I observe is an underestimate of the true effect, and my results support a positive finding, even with this potential bias.

For this analysis to overestimate the magnitude of the correlation, there would need to be an unobserved variable that is positively correlated with both parental coresidence and youth coresidence. Potential causes of this could be a disabled family member,[5] or other systematic hindrances to earning income (e.g. a disposition not conducive to employment

[5]Disabled family members are observationally rare in the NLSY; only 10% of respondent households have a disabled family member. Controlling for this does not affect the main results.

that is common to both generations). However, controlling for income should account for the majority of a family correlation in "need."

I have imputed exits for those who are observed to coreside in one year, then are missing in the data, and then show up as not coresident. This is a small number of exits (214 of more than 6,000), and their exclusion (or inclusion) does not significantly affect the estimates. As the data are self-reported, there are also concerns about misrepresentation. For example, some 17-year-olds claim to be living in a household independent of their parents in which they are the primary householder. I have recoded any occurrence of a respondent younger than 25 claiming to be the head of household but reporting coresident parents as independent housing for both; that is, I have not recorded this as parents living with children (dependent parents), but have not recorded this as children living with parents (dependent children). In the tables presented, the only parental figures coded as coresident are biological or step-parents (not in-laws), but inclusion of mothers-in-law, fathers-in-law, step-mothers-in-law, and step-fathers-in-law does not significantly change the estimates.

Finally, there may be inherent characteristics that cause people to be dependent or simply prefer coresidence that are genetically or behaviorally transmitted between parents and children. One would expect, then, that children who themselves left late would be more likely to coreside with their children when older. Unfortunately the cohorts in the NLSY are not yet old enough to measure this effect, but this will be testable as the 1979 cohort ages.[6] Furthermore, just as with altruism, I would need these characteristics to be selectively transmitted along certain parent-child dyads and not others in order to find the between-sibling effect observed.

It is also possible that the dyadic links are indications of love or "favorite child" status. Unfortunately, this is not discernible in the NLSY79. In any case, although I may be putting the wrong label on the observed relationship, it is concretely observed. I would need exogenous variation in the intended age of departure (and thus in capacity to signal generosity) in order to disentangle our empirical findings from a simple model of love.

6 Conclusions

This paper presents evidence that behaviors by youth that inconvenience parents during emerging adulthood are correlated with future youth generosity (permitting parent coresi-

[6] As a robustness check, I compare demographic characteristics among those in the 10th percentile of exits, those in the 90th percentile of exits, and those at the mean. I show that while white individuals are more likely to leave early, and black individuals are more likely to leave late, exiters at all ages look fairly similar in terms of education, birth order, and self-esteem (although early exiters are slightly more educated).

dence in old age). These results are robust to including controls for family size (of both the parent and the child) and regional relocation. The strong results for the family size of both generations suggests that the support network available to the parents plays a role in determining their residence (both the need for coresidence instead of direct financial transfers and the offer of coresidence from various children).

Modeling these behaviors is important for policy in that there is significant potential for government action to crowd out family support networks. According to the mixed motivations model presented, an increase in government support to emerging adults decreases the need for parental transfers at that age, and thus adds noise to the signaling game, preventing parents from precisely communicating their types. This communication breakdown could have repercussions for parental support in old age, as children would be unable to determine which parents were generous and which were ungenerous. This problem is particularly relevant as life expectancies increase and parents outlive their individuals resources. Thus, I might expect an expansion of aid programs for emerging young adults to cause in increase in need for public aid among elderly individuals 20 years later, a non-intuitive result.

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7 Tables and Figures

Figure 1: Homeownership and Parental Coresidence among Young Adults

Note: Data from the Current Population Survey

Table 1: Descriptive Statistics of Sample

	Count(N)	Mean	Std. Dev.
Dependent Variable			
Parents ever live with respondent	6,413	0.24	0.43
Education/Income			
AFQT percentile	6,144	41.08	28.80
Highest grade completed	6,413	13.20	2.50
Average income from 30 to 45	6,272	49,988	51,981
Assets	5,850	6,048	12,003
Demographics			
Female	6,413	0.50	0.50
Hispanic	6,413	0.19	0.39
Black	6,413	0.30	0.46
First born	6,405	0.20	0.40
Last born	6,405	0.25	0.43
Total siblings	6,405	3.80	2.60
Exit variables			
Exited parental household prior to 1979	6,413	0.07	0.26
Age at first exit from parental household (of those not already out in 1979)	6,199	21.6	3.0
Age at last observed exit from parental household	6,199	27.0	7.5
First exited at 24 or older	6,413	0.20	0.40
Ever returned to parental household	6,413	0.61	0.49
Family formation			
Never married	6,413	0.18	0.39
Ever separated or divorced	6,413	0.41	0.49
Biologically parented child before age 20	5,089	0.24	0.42
Age at first birth	5,089	24.4	5.9
Any biological children	6,019	0.72	0.45
Biological children	6,019	1.60	1.40

Table 2: Coresidence is generationally correlated

	(1)	(2)	(3)
Exited at age 24+	0.147***		0.203***
	(0.0142)		(0.0133)
Black	0.0816***	0.0713***	0.0514***
	(0.0165)	(0.0145)	(0.0157)
Hispanic	0.166***	0.135***	0.131***
	(0.0185)	(0.0162)	(0.0177)
ln(Family income)	-0.0228***	-0.0135**	-0.00735
	(0.00759)	(0.00671)	(0.00721)
Ever married	-0.122***	-0.133***	-0.0788***
	(0.0232)	(0.0214)	(0.0225)
Ever separated or divorced	0.0807***	0.0282**	0.0429***
	(0.0138)	(0.0119)	(0.0132)
Ever returned		0.268***	0.294***
		(0.0126)	(0.0126)
Observations	5,045	5,882	5,045
R-squared	0.075	0.140	0.167

Specification is a linear probability model; dependent variable is having a coresident parent. All columns also control for gender, birth year, childbearing, education, and sibling composition.
*** Significant at the 0.01 level.
** Significant at the 0.05 level.
* Significant at the 0.10 level.

Table 3: Relationship robust to non-parametric specification

	(1)	(2)
Exited at 20	0.0237	
	(0.0240)	
Exited at 21	0.0520**	
	(0.0243)	
Exited at 22	0.0934***	
	(0.0246)	
Exited at 23	0.0761***	
	(0.0239)	
Exited at 25	0.187***	
	(0.0287)	
Exited at 24	0.109***	
	(0.0265)	
Exited at 26	0.242***	
	(0.0327)	
Exited at 27	0.291***	
	(0.0398)	
Exited at 28	0.285***	
	(0.0429)	
Exited at 29+	0.522***	
	(0.0296)	
Ever returned	0.315***	0.268***
	(0.0123)	(0.0126)
Black	0.0328**	0.0713***
	(0.0154)	(0.0145)
Hispanic	0.114***	0.135***
	(0.0173)	(0.0162)
ln(Family income)	-0.000652	-0.0135**
	(0.00714)	(0.00671)
Ever married	-0.0726***	-0.133***
	(0.0218)	(0.0214)
Ever separated or divorced	0.0472***	0.0282**
	(0.0128)	(0.0119)
Observations	5,045	5,882
R-squared	0.210	0.140

Specification is a linear probability model; dependent variable is having a coresident parent. All columns also control for gender, birth year, childbearing, education, and sibling composition.

*** Significant at the 0.01 level.

** Significant at the 0.05 level.

* Significant at the 0.10 level.

Table 4: Relationship persists across income strata

	(1) Low	(2) Lower Middle	(3) Middle	(4) Upper Middle	(5) Upper
Exited at age 24+	0.201***	0.174***	0.242***	0.180***	0.235***
	(0.0322)	(0.0320)	(0.0285)	(0.0276)	(0.0274)
Ever returned	0.312***	0.259***	0.364***	0.297***	0.272***
	(0.0287)	(0.0281)	(0.0274)	(0.0279)	(0.0270)
Black	0.0395	0.00889	0.0258	0.0880**	0.0975***
	(0.0369)	(0.0339)	(0.0345)	(0.0346)	(0.0367)
Hispanic	0.123***	0.130***	0.119***	0.149***	0.120***
	(0.0440)	(0.0406)	(0.0358)	(0.0396)	(0.0387)
Ever married	-0.0313	-0.128***	-0.0383	-0.140*	-0.107
	(0.0435)	(0.0446)	(0.0527)	(0.0750)	(0.0764)
Ever separated or divorced	0.0197	0.0309	0.0188	0.0380	0.0767***
	(0.0393)	(0.0351)	(0.0281)	(0.0252)	(0.0269)
Observations	1,015	1,026	1,029	1,039	1,102
R-squared	0.142	0.140	0.206	0.179	0.178

Specification is a linear probability model; dependent variable is having a coresident parent. All columns also control for gender, birth year, childbearing, education, and sibling composition.

*** Significant at the 0.01 level.

** Significant at the 0.05 level.

* Significant at the 0.10 level.

Table 5: Family linkages exist across racial/ethnic subgroups

	(1) White	(2) Black	(3) Hispanic
Exited at age 24+	0.189***	0.199***	0.249***
	(0.0179)	(0.0251)	(0.0330)
Ever returned	0.285***	0.296***	0.314***
	(0.0170)	(0.0237)	(0.0301)
ln(Family income)	-0.0125	-0.00603	0.00399
	(0.00907)	(0.0143)	(0.0198)
Ever married	-0.0766**	-0.0809**	-0.0612
	(0.0360)	(0.0363)	(0.0566)
Ever separated or divorced	0.0478***	0.0217	0.0611*
	(0.0166)	(0.0280)	(0.0337)
Observations	2,695	1,417	933
R-squared	0.149	0.146	0.165

Specification is a linear probability model; dependent variable is having a coresident parent. All columns also control for gender, birth year, childbearing, education, and sibling composition.
*** Significant at the 0.01 level.
** Significant at the 0.05 level.
* Significant at the 0.10 level.

Table 6: Needy parents likely to coreside with child who "inconvenienced"

	All respondents 40+	Respondents with sample siblings	
	(1)	(2)	(3)
Exited at age 24+	0.203***	0.210***	0.198***
	(0.0133)	(0.0176)	(0.0273)
Ever returned	0.294***	0.294***	0.286***
	(0.0126)	(0.0168)	(0.0252)
ln(Household income at age 40)	-0.00735	-0.00826	-0.0101
	(0.00721)	(0.00972)	(0.0151)
Married	-0.0788***	-0.0902***	-0.0688*
	(0.0225)	(0.0276)	(0.0400)
Separated or divorced	0.0429***	0.0345*	0.0399
	(0.0132)	(0.0181)	(0.0272)
Controls for family background	Y	Y	N
Family fixed effect	N	N	Y
Observations	5,045	2,688	2,719

Specification is a linear probability model; dependent variable is having a coresident parent. All columns also control for gender, birth year, childbearing, education, and sibling composition.

*** Significant at the 0.01 level.

** Significant at the 0.05 level.

* Significant at the 0.10 level.