



# Consumption and the extended family



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## HIGHLIGHTS

- Empirical tests of the altruism and life-cycle models' predictions are conducted.
- Tests are based on national longitudinal data on consumption and own/extended family income.
- Little to no evidence is found in support of altruism.
- The extended family income affects own consumption, inconsistent with a simple life-cycle model.

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## ABSTRACT

This study examines whether resources of the extended family influence consumption. Extending prior tests on just food consumption to total consumption, little to no evidence is found in support of the strict definition of altruism among related households. However, resources of the extended family / dynasty do affect one's own consumption.

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## 1. Introduction

Empirical studies have examined the extent to which the economic decisions of extended family members are interconnected. Altonji, Hayashi, and Kotlikoff (AHK, 1992) is the most influential study of this type, where they find little evidence that income of extended family members affects food consumption. Furthermore, they find no empirical evidence in support of altruism as the underlying motivation for family behavior. AHK was limited by the fact that in their data – the Panel Study of Income Dynamics through 1985 – the only consumption category that could be analyzed was food consumption. Here we take advantage of the fact that the PSID subsequently significantly expanded the measurement of consumption, allowing us to study a much more comprehensive measure. Having more expansive data on

consumption may be important because food is a necessity so the effects of (own) income on food consumption are small relative to the effects on other components of consumption. AHK's conclusions that the income of the extended family has limited effects on food consumption may not characterize the effects on total consumption.

## 2. Data

The PSID expanded measures of consumption expenditures significantly in 1999, and again in 2005. With the new questions, the PSID captured roughly 70% of expenditures between 1999 and 2003 (food, housing, utilities, vehicles, transportation, health care, education, and child care) and 95% of expenditures from 2005 through 2011 (the prior list plus clothing and apparel, home repairs and maintenance, household furnishings and equipment, recreation and entertainment, and trips and vacations). Furthermore, estimates of spending based on the PSID align well with the estimates from the Consumer Expenditure Survey—the gold standard for consumption data (Li et al., 2010; Andreski et al., 2014). We report estimates for models for two time periods: 1999–2011 with

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**Table 1**  
Number of individuals, PSID family units, and dynasties.

	Analytic sample without restricting to nested dynasties (Baseline sample)					All individuals 24 and older				
	Number of individuals (unit of analysis)	Number of heads	Number of wives	Number of PSID family units	Number of dynasties	Number of individuals (unit of analysis)	Number of heads	Number of wives	Number of PSID family units	Number of dynasties
1999	5 310	3 523	1 787	4 696	1 326	11 687	6 795	3 840	6 691	2 490
2001	5 686	3 758	1 928	5 031	1 359	12 318	7 168	4 065	7 079	2 426
2003	6 106	4 083	2 023	5 403	1 414	13 014	7 612	4 169	7 490	2 393
2005	6 594	4 396	2 198	5 817	1 452	13 469	7 806	4 331	7 665	2 347
2007	6 879	4 613	2 266	6 053	1 473	13 905	8 102	4 454	7 909	2 278
2009	7 380	4 995	2 385	6 496	1 517	14 594	8 514	4 599	8 335	2 244
2011	7 612	5 207	2 405	6 719	1 504	14 887	8 735	4 594	8 549	2 190
Total	45 567	30 575	14 992	40 215	10 045	93 874	54 732	30 052	53 718	16 368

Analytic sample: heads and wives 24 and older who have – in the same year – at least one non-co-resident biological mother, father, child, or full/half sibling who is also a head or wife 24 or older.

the more limited set of measures, and 2005–2011 with the more expansive measures.

The PSID has two additional strengths. First, when children of PSID sample members leave a PSID household they continue to be interviewed by the survey. Second, the PSID contains detailed information on income, wealth, as well as consumption.

Our baseline sample consists of all PSID heads and wives aged 24 or over who have at least one non-co-resident relative (specifically, a biological mother, father, or child, or a half or full sibling) who is also a head or wife and at least 24 years old. The number of such individuals in each year is reported in Table 1.

We define a dynasty to include one's biological mother, father, child(ren), and full/half siblings who are also PSID heads or wives aged 24 or over and do not live in the same PSID family unit as that individual. The members of a dynasty can change over time as family members reach age 24 or become a head / wife, and because step-siblings may move in or out due to divorce or marriage by parents. Moreover, dynasty composition of a focal person may differ from the dynasty composition of a fellow dynasty member. Potential sources of such cases include in-law relationships, remarriage, grandchildren, and grandparents. About half of sample members are not nested within a dynasty.<sup>1</sup> For some empirical models we include dynasty fixed-effects. In these models we restrict the sample to individuals within dynasties where all members of a given dynasty share the same dynasty members.

Dynasty income and wealth is the average among family units within the dynasty, excluding those for one's own family unit. It is not clear whether AHK included the value of food stamps in their measure of food consumption. Therefore, we estimated models excluding and including food stamps and discuss both sets of results. CPI-U was used for the price adjustment, expressed in 2011 dollars. Descriptive statistics for all variables for each analysis sample are summarized in Table 2.

### 3. Testing altruism and life cycle models

The altruism model implies that own resources have no effect on own consumption once dynasty resources are controlled (AHK, 1992). The lifecycle model predicts that own resources influence own consumption. We test these predictions using AHK's econometric approach but with more expansive consumption data.

<sup>1</sup> We also estimated models using a broader definition of dynasty where anyone in the same PSID "1968 ID" is defined as being members of the same dynasty. Our substantive findings did not change and therefore we do not report estimates using the broad definition.

**Altruism.** The econometric model used for the static test of altruism is:

$$c_{ikt} = \beta' X_{ikt} + \varphi Y_{ikt} + \alpha_{it} + \mu_{ikt} \quad (1)$$

where  $c_{ikt}$  is log consumption (i.e., food 1999–2011; total 1999–2011; total, expanded 2005–2011) by household  $k$  of dynasty  $i$  in year  $t$ ,  $X_{ikt}$  are demographic control variables (quadratic in the number of members in own household and average number of members of households within one's dynasty, own age and age of household head, own gender and the gender of household head, race of household head, marital status of household head),  $Y_{ikt}$  is log own household income excluding private transfers,  $\alpha_{it}$  is the dynasty fixed effect, and  $\mu_{ikt}$  is the error term that is assumed to be uncorrelated with  $Y$ . All years of data are pooled (i.e., if an individual is observed  $n$  times, they contribute  $n$  observations to the analysis), and we include dummy variables for each year as controls.

The dynamic test is the first difference of (1):

$$\Delta c_{ikt} = \beta' \Delta X_{ikt} + \varphi \Delta Y_{ikt} + \Delta \alpha_{it} + \Delta \mu_{ikt}. \quad (2)$$

The test of altruism in Eqs. (1) and (2) is  $\varphi = 0$ . Standard errors for both models are White standard errors, allowing for clustering at the year-dynasty level. Because the PSID has surveyed respondents every two years since 1997, the first difference in our analysis is the difference between year  $t$  and year  $t - 2$ . Households are not stable units over time. For example, when a couple divorces the household splits. Therefore, all analyses use individual adults (PSID heads / wives) as the units of analysis.

To compare our results with AHK's, we begin by modeling food consumption but for the years of data on which we focus, 1999–2011 (Table 3). For the static models, we find that own income has a sizable effect, with an elasticity of 0.290 when the dynasty fixed effect is not included but we restrict to individuals in nested dynasties, very similar to AHK's estimate of 0.286 (Table 3, row 1, in brackets). Not restricting to nested dynasties leads to a very similar estimate, 0.303. Adding fixed effects lowers the income effect to 0.240, which is the same as AHK (0.240; their Table 3, row 1).

The dynamic test implies a substantially lower but still statistically significant effect of own household income: 0.075 without dynasty fixed effects and 0.090 with the fixed effects. Our dynamic estimates are smaller than AHK's. Including the amount of food stamps as food spending lowers the effect of own income; however, the effect of own income remains statistically significant and substantial.

As expected, own income has a larger effect on the broader measures of consumption. First consider consumption (excluding food stamps) that is consistently measured from 1999–2011. For

**Table 2**  
Descriptive statistics.

Characteristic	Statistic	Nested dynasty sample N = 23 314	Baseline analysis sample N = 45 567	All individuals ≥ 24 N = 93 874
Age	mean (years)	48.4	47.1	45.3
Female	%	54.8	55.6	53.6
Race of head				
White	%	68.9	65.8	62.2
Black	%	26.5	30.8	30.9
Others	%	4.6	3.4	6.9
Marital status of head				
Married or permanently cohabiting	%	70.4	64.7	67.1
Single, never legally married	%	12.6	15.7	12.7
Widowed	%	4.9	5.5	5.7
Divorced	%	9.4	10.9	10.2
Separated	%	2.7	3.2	4.3
Number of family members	q25; q50; q75	2; 2; 4	2; 2; 4	2; 3; 4
Annual family consumption				
Food (without foodstamp)	median (\$)	6240	5720	6160
Foodstamp	% of >0; median \$ among >0	7%; 2400	9%; 2532	10%; 2760
Total consumption	median (\$)	31 131	29 637	31 047
Total consumption/# in FU	median (\$)	12 748	12 584	11 651
Total consumption 2005–2011	median (\$)	41 516	38 000	40 033
Total consumption/# in FU 2005–2011	median (\$)	17 032	16 285	15 072
Annual family income				
Family Income without transfer	median (\$)	56 108	51 000	52 706
Per capita Family Income without transfer	median (\$)	22 950	21 683	19 733
Family non-asset income	median (\$)	54 600	50 000	51 600
Annual narrow dynasty income				
No. of families per dynasty	q10; q50; q90	2; 4; 7	2; 3; 6	–
Average narrow dynasty income (per family)	median (\$)	61 323	58 180	–
Average expansive dynasty non-asset income (per family)	median (\$)	59 147	56 067	–
Family wealth				
Family wealth without equity	median (\$)	27 000	18 000	16 000
Per capita Family wealth without equity	median (\$)	10 500	7300	5700
Family wealth with equity	median (\$)	83 000	57 800	52 000
Per capita Family wealth with equity	median (\$)	32 075	23 000	18 339
Narrow dynasty wealth				
No. of families per dynasty	q10; q50; q90	2; 3; 5	2; 3; 6	–
Average narrow dynasty wealth without equity (per family)	median (\$)	48 880	41 683	–
Average narrow dynasty wealth with equity (per family)	median (\$)	106 734	92 225	–

**Table 3**  
Tests of altruism: Effects of own income on consumption.

	Static test					Dynamic test				
	Baseline sample		Restricted to nested dynasty sample			Baseline sample		Restricted to nested dynasty sample		
	No dynasty fixed effect	Sample size	No dynasty fixed effect	Dynasty fixed effect	Sample size	No dynasty fixed effect	Sample size	No dynasty fixed effect	Dynasty fixed effect	Sample size
Food 1999–2011, excluding food stamps	0.303***	44 085	0.290***	0.240***	22 677	0.084***	32 813	0.075***	0.090***	16 349
			[0.286 t = 33.07]	[0.240 t = 23.29]	23 257			[0.144 t = 13.35]	[0.137 t = 10.43]	15 439
Food 1999–2011, including food stamps	0.204***	44 481	0.212***	0.170***	22 826	0.050***	33 254	0.054***	0.056***	16 501
Total consumption 1999–2011, excluding food stamps	0.424***	44 632	0.418***	0.358***	22 895	0.090***	33 454	0.099***	0.100***	16 588
Total consumption 1999–2011, including food stamps	0.389***	44 611	0.391***	0.332***	22 883	0.075***	33 419	0.086***	0.084***	16 570
Total consumption, expanded, 2005–2011, excluding food stamps	0.459***	28 026	0.461***	0.405***	12 878	0.112***	18 455	0.126***	0.128***	8 236
Total consumption, expanded, 2005–2011, including food stamps	0.424***	28 003	0.433***	0.378***	12 865	0.098***	18 422	0.113***	0.110***	8 217

AHK's estimates reported in brackets and are from Table 3 in their manuscript. AHK dynamic tests are for two-year difference to parallel our two-year differences. Control variables included in all models: quadratics in the number of members in own household and average number of members of households within one's dynasty, own age and age of household head, own gender and the gender of household head, race of household head, marital status of household head, year dummies.

\*\*\* Indicates statistical significance at the 0.001 level.

**Table 4**  
Static tests of life cycle model: Effects of own and dynasty resources on consumption.

	Food 1999–2011, excluding food stamps	Food 1999–2011, including food stamps	Total consumption 1999–2011, excluding food stamps	Total consumption 1999–2011, including food stamps	Total consumption, expanded, 2005–2011, excluding food stamps	Total consumption, expanded, 2005–2011, including food stamps
	N = 28 509	N = 28 493	N = 28 509	N = 28 493	N = 18 912	N = 18 899
Own income						
$t$	0.197***	0.122***	0.247***	0.226***	0.267***	0.247***
$t - 2$	0.076***	0.062***	0.129***	0.126***	0.135***	0.130***
$t - 4$	0.067***	0.055***	0.112***	0.109***	0.125***	0.124***
ihs own wealth time $t$	0.003***	0.002***	0.002***	0.002***	0.003***	0.003***
Dynasty income						
$t$	0.041***	0.031***	0.040***	0.038***	0.053***	0.050***
$t - 2$	0.007	0.008	0.014*	0.015	0.007	0.008
$t - 4$	0.019*	0.008	0.022***	0.018**	0.024**	0.020**
ihs dynasty wealth time $t$	−0.001	−0.002**	−0.001***	−0.001*	−0.001	−0.001***
Sum of income coefficients						
Own	0.340***	0.239***	0.488***	0.462***	0.526***	0.501***
Dynasty	0.066***	0.047***	0.076***	0.071***	0.083***	0.078***

Control variables included in all models: quadratics in the number of members in own household and average number of members of households within one's dynasty, own age and age of household head, own gender and the gender of household head, race of household head, marital status of household head, year dummies.

ihs = inverse hyperbolic sine transformation.

\* Indicates statistical significance at the 0.05 level.

\*\* Indicates statistical significance at the 0.01 level.

\*\*\* Indicates statistical significance at the 0.001 level.

\*\*\*\* Indicates statistical significance at the 0.10 level.

these categories of spending, the effect of own income in the dynamic fixed effect specification is 0.100 for total consumption versus 0.090 for food consumption only. The most inclusive measure of consumption, available for 2005–2011, has an own income effect of 0.128 in the dynamic fixed effect model. In sum, regardless of specification, own income has a substantial, statistically significant effect on consumption, which is inconsistent with altruism.

**Life-cycle model.** As expressed in Eq. (3), the static test of the life-cycle model consists of regressing log consumption on log own household income (excluding private transfers and asset income),  $Y_{ikt}$ , for time  $t$  and lagged two periods (recall that interviews are conducted every other year so a lag of one period represents a lag of two years in length), log average dynasty income (excluding private transfers and asset income),  $Y_{it}^d$ , for time  $t$  and lagged two periods, household wealth without home equity at time  $t$ ,  $W_{ikt}$ , and average dynasty wealth without home equity at time  $t$ ,  $W_{it}^d$ . We use the inverse hyperbolic sine transformation on wealth because a substantial share of families has zero or negative wealth.

$$C_{ikt} = \beta' X_{ikt} + \varphi^0 Y_{ikt} + \varphi^2 Y_{ikt-2} + \varphi^4 Y_{ikt-4} + \varphi^{d0} Y_{it}^d + \varphi^{d2} Y_{it-2}^d + \varphi^{d4} Y_{it-4}^d + \theta W_{ikt} + \theta^d W_{it}^d + \mu_{ikt}. \quad (3)$$

Control variables include demographic factors (a quadratic in the number of members in own household and average number of members of households within one's dynasty, own age and age of household head, own gender and the gender of household head, race of household head, marital status of household head) and year dummy variables. The lifecycle model predicts that the dynasty income effect is zero, i.e.,  $\varphi^{d0} + \varphi^{d2} + \varphi^{d4} = 0$ .

Estimates from the static model imply a substantial effect of own income on food consumption including food stamps, with a total effect (i.e., the sum of current and two lagged effects) equal to 0.239 (Table 4). The estimate of dynasty income is 0.047 and statistically significant.<sup>2</sup>

<sup>2</sup> Comparisons with AHK are not strictly comparable because they use annual data and lagged income measured at  $t - 1$  and  $t - 2$  instead of  $t - 2$  and  $t - 4$ . Furthermore, AHK includes own income (wealth) in dynasty income (wealth). We re-estimate the models reported in Table 4 by using AHK's definition of dynasty income and wealth and find effects of dynasty that are somewhat larger than those reported in the last row of Table 4; 0.113, 0.093, 0.143, 0.139, 0.163, and 0.157, with all estimates statistically significant at the 0.001 level.

The effects of own income and dynasty income are larger for the more expansive measures of consumption. When food stamps are included, for food, total consumption (1999–2011), and total expanded consumption (2005–2011), the own income effect (dynasty income effect) is 0.239 (0.047), 0.462 (0.071), and 0.501 (0.078), respectively.

The dynamic test of the lifecycle model consists of estimating equation (3) but where change in log consumption is the dependent variable and change in log own income and change in log average dynasty income are the key explanatory variables. Control factors include year dummy variables and changes in the demographic factors listed above for Eq. (3). We estimate models of change over two years and four years. For two-year change, we find estimates of own income on food of 0.049 when food stamps are included (Table 5). As expected, own income effects are larger when consumption on additional items is considered: 0.093 for the most comprehensive measure of consumption. The estimates based on four-year change (0.136 for the most comprehensive measure of consumption) are larger than two-year change (0.093).

The dynamic tests with four-year change imply marginally significant but meaningful effects of dynasty income. For food consumption including food stamps, the dynasty effect is 0.011, which is roughly 1/7th the size of the effect of own income, 0.070. The more comprehensive measure available for 1999–2011 has a similar dynasty effect – 0.010 – and is roughly 1/10th the size of the effect of own income. For the most comprehensive measure of consumption, available for 2005–2011, the dynasty effect is 0.014, also roughly 1/10th the size of the effect of own income, 0.136. However, with roughly half the sample size, this effect is not statistically significant. In sum, we interpret the collection of estimates from the static and dynamic models as indicating suggestive evidence of an effect of dynastic income on one's own consumption.

#### 4. Conclusions

AHK's seminal study uses data on food consumption in the PSID to test whether resources are shared fully within families. They

**Table 5**  
Dynamic tests of the life cycle model: Effects of change in own and dynasty resources on change in consumption.

	Food 1999–2011, excluding food stamps	Food 1999–2011, including food stamps	Total consumption 1999–2011, excluding food stamps	Total consumption 1999–2011, including food stamps	Total consumption, expanded, 2005–2011, excluding food stamps	Total consumption, expanded, 2005–2011, including food stamps
$t - (t - 2)$	$N = 30\,718$	$N = 30\,852$	$N = 30\,948$	$N = 30\,913$	$N = 17\,867$	$N = 17\,837$
Change in own income	0.085 <sup>***</sup>	0.049 <sup>***</sup>	0.084 <sup>***</sup>	0.070 <sup>***</sup>	0.107 <sup>***</sup>	0.093 <sup>***</sup>
Change in dynasty income	0.008	0.004	0.005	0.005	0.005	0.004
$t - (t - 4)$	$N = 23\,611$	$N = 23\,713$	$N = 23\,777$	$N = 23\,758$	$N = 11\,064$	$N = 11\,052$
Change in own income	0.120 <sup>***</sup>	0.070 <sup>***</sup>	0.129 <sup>***</sup>	0.112 <sup>***</sup>	0.155 <sup>***</sup>	0.136 <sup>***</sup>
Change in dynasty income	0.013 <sup>****</sup>	0.011 <sup>****</sup>	0.011 <sup>****</sup>	0.010 <sup>****</sup>	0.014	0.014

Control variables included in all models: quadratics in the number of members in own household and average number of members of households within one's dynasty, own age and age of household head, own gender and the gender of household head, race of household head, marital status of household head, year dummies.

<sup>\*\*\*</sup> Indicates statistical significance at the 0.001 level.

<sup>\*\*\*\*</sup> Indicates statistical significance at the 0.10 level.

examine the effect of own income on consumption controlling for extended-family fixed effects, and they strongly reject strict altruism and furthermore find limited to no evidence that changes in dynastic income lead to changes in food consumption over the period 1976–1985. Our estimates using more comprehensive information on consumption from 1999 to 2011 imply similar qualitative conclusions about altruism. However, the estimates from the static and dynamic models taken together imply evidence in favor of effects of dynastic income on own consumption.

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