Intergenerational Support and Family Economic Consequences of Diabetes

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Introduction

Intergenerational exchanges between older adults and their adult children represent a major source of support for both parents and adult children. Population aging in the U.S. is occurring alongside later childbearing, rising life expectancy, and extended financial dependence of children (1-3)(4-5). As a result, parents may have more years in later life during which they provide substantial support for their children (6). In turn, rising life expectancies may imply more years lived with disability, extending the needs for upward support from children.

Diabetes has been increasing in the U.S. population, increases with age, and is a major source of morbidity and health-related costs. Diabetes is a common, progressive, and costly condition, affecting over 29 million people in the United States.[7] Studies have shown diabetes tends to cluster within families and that people whose spouse has a history of diabetes had higher risks of also having diabetes.[8]

The goal of this research is to understand the implications of diabetes for families' economic wellbeing and for intergenerational support. Specifically, we quantify changes in family economic stability after a diabetes diagnoses and assess whether giving of financial and instrumental support between older adults and their children is different in families that have had a diabetes diagnoses.

This analysis uses data on a long-term well-characterized cohort, the PSID (Panel Study of Income Dynamics). The PSID includes unparalleled data on families' economic situation, rich data on financial and instrumental support between parents and children, and self-reported health conditions, including diabetes. These data permit us to characterize longitudinally the positive and negative ways in which intergenerational support and financial wellbeing change with diabetes.

Background

Intergenerational relations revolve around exchanges of material, instrumental, and emotional

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support across the life course, with parents being providers at most stages, but also recipients at the oldest ages (9,10, 36). In the U.S., intergenerational relations tend to center on the needs of children, not of parents (11-12). Providing support generally is associated with better parental health (13-14).

At the same time, upward material, instrumental, and emotional support from children has been shown to be important to parents (15). In the U.S., when parents experience widowhood or declines in health, adult children increase contact, co-residence, and support and become less dependent on the surviving parent (16,17,18). About 1/3 of older adults in the U.S. would be living in poverty without co-residential support from relatives, and such support is especially important for economically disadvantaged individuals (19). Yet few studies have isolated the changes in upward financial and instrumental support in response to declines in parental health. Parents receiving support from children may have fewer depressive symptoms, fewer functional limitations, and lesser declines in mental health (20, 21, 22, 23). The few longitudinal studies to date suggest that children's responses may vary with the type of parental health decline (for example, reduced financial, instrumental, and emotional support after depressive symptoms) and may differ between sons and daughters (24).

Data and Methods

The PSID began in 1968 with a nationally representative sample of over 18,000 individuals living in 5,000 families in the United States. Information on these individuals and their descendants has been collected continuously, including data covering employment, income, wealth, expenditures, health, marriage, childbearing, child development, philanthropy, education, and numerous other topics.

A new module, the Family Roster and Transfer Module, provides rich data on financial and instrumental support provided between parents and children. The Family Roster and Transfer

Module collected data from 9,107 families participating in PSID in 2013. Of the 9,107 families, 4,767 had no adult child records, leaving 4,340 families with information on transfers to and from adult children, constituting our analytic sample. These data permit us to characterize longitudinally the positive and negative ways in which intergenerational support and financial wellbeing change with diabetes.

The PSID includes several questions on diabetes, collected every 2 years since 1999: Has a doctor ever told you that you have or had diabetes or high blood sugar? How long have you had diabetes? How old were you when you were first diagnosed with diabetes? Did this condition get much worse for a month or longer (in the past 12 months/since you were first diagnosed)? How much does this (condition/problem) limit your normal daily activities? Before you were 17 years old, did you have diabetes and was it Type I or Type II diabetes?

For this analysis, we focus primarily on the first-listed variable and determine for each participant. We examined both prevalent and incident cases of diabetes, as the implications of diabetes may be different during the first year after diagnosis. On one hand, there may be a shock of a new diagnosis, leading the newly diagnosed person to reconsider his or her giving or other family members to step in to offer help; thus, people may react with economic decisions and with giving and receiving not as a result of actual changes in health or need, but changes in worry and awareness of need. On the other hand, the morbidity associated with diagnosis takes time to set in, so the implications of the disease only take a toll with time; thus, individuals' needs and economic predicament are likely to increase with time since diagnosis. Thus, two variables were created: first, whether an individual is an incident case, calculated at each data year based on whether a diabetes diagnosis is reported at that wave but not at the previous wave; a prevalent case was coded as one at each wave if the individual reported having been diagnosed with diabetes at that or at any earlier data wave.

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We also created a variable measuring duration of diabetes, to quantify the changes in economic wellbeing and in exchanges associated with additional years of exposure to the disease. This variable was based on time in 2013 since the first time the head reported having diabetes. As the question is asked every 2 years, duration was set at the midpoint of the interval. If the head never reported diabetes, the variable is 0 years of exposure.

We use measures of downward (parent-to-children) and upward (children-to-parent) monetary and instrumental support, as reported by parents in 2013. For downward support, among families where at least 1 of the spouses was over age 30 and had at least 1 child over age 18, respondents were asked whether they spent time helping each child and the amount of time; and whether they provided financial support and how much in terms of: money, loans, or gifts ≥$100; school-related expenses; assistance buying a home; other financial assistance. Upward support is measured by parents' reports of whether children spent time helping the parent and amount of time; and whether children gave money, loans, or gifts ≥$100 to the parent and amount given.

Analytic models include other characteristics that are believed based on the literature to be associated with intergenerational exchanges. For the current analysis, these are characteristics of the parent and household: education, household income (25-28,30), marital status (31,32,29), number of children (30), non-family social support (33).

Analysis include descriptive characteristics of the variables identified above, followed by longitudinal models. The general analytic strategy for examining economic consequences of a diabetes diagnosis is to examine changes in economic variables associated with a diabetes diagnosis relative to no diabetes diagnosis. The general analytic strategy for examining support patterns associated with a diabetes diagnosis is to estimate the probability of receiving or giving support from children for those who did and did not have a diabetes diagnosis. Using lagged analyses: first, we assess whether *changes* in parents' diabetes status between the previous data wave in 2011 and 2013

relate to giving or receipt of support from children in 2013. Then, we use the constructed variable of time since diagnosis to explore longer-term changes in parental health.

Results

Table 1 shows the prevalence of diabetes among household heads between 1999 and 2013. Consistent with other estimates for adults, the prevalence of diabetes increases by about 1% per year during the period, reaching almost 16% in 2013. Among household heads with diabetes in 2013, 5% had reported being diagnosed within the past 4 years, and the average time spent with diabetes among those diagnosed by 2013 was about 4 years.

Table 2 shows that families in which the household head has diabetes are different in many characteristics from households in which the household head has never been diagnosed with diabetes. The most important differences are in age, as would be expected –households with a diabetic household head are older, with both the household head and wife being a decade older (61.7 vs. 50.3 and 58.3 vs. 48.9). When the household head has diabetes, more often that person is a woman and is white. Households with a diabetic head are different in terms of household structure, at least in part due to being older: they have more children on average, but fewer children residing with them; they also have fewer surviving parents. They are also financially different, again, at least in part due to older age. The household head is less often employed (39.6 vs. 65.6%) and works 25% fewer hours per week (29 vs. 41 hours). They more often own their home and have health insurance, but have substantially lower income, at an average of $60,202 compared with $76,159 in households without diabetes. Household heads with diabetes give time and money less often to help their children, significantly so in terms of money (39% give any money, compared with 48% among other households). They also receive substantially less often time and monetary help from their parents.

Our first research question related to the economic consequences of diabetes. As a first approach to addressing this question, we examined the financial wellbeing of households whose head did and did not have diabetes in 2013 or the most recent data wave when the information was sought (Table 3). Separate models were estimated to examine the associations between prevalent diabetes and family income (logged), family wealth including equity (logged), home ownership, employment status, debts, and making charitable donations. After adjusting for the age and gender of the household head, whether he or she is working (for all models expect where employment is the outcome), number of co-residing children, urbanicity and census region, households with a diabetic head had generally poorer indicators of financial wellbeing across indicators. There were significant differences in wealth and employment: they had 4% lower wealth and were 40% less likely to be employed.

As a next step, we examined whether households had actually experienced negative economic shocks after the household head was diagnosed with diabetes. In Table 4, we examined changes in financial wellbeing between 2009 and 2013, comparing those who had reported a diabetes diagnosis between 20005 and 2009 with those who had never reported a diagnosis in terms of income change, wealth change, loss of home, discontinuation of employment, and discontinuation of charitable donations. After adjusting for the demographic and residential variables, we found no difference in financial shocks across this period between households with and without a head with diabetes.

Our second research question related to the consequences of diabetes for intergenerational exchanges. As a first approach to addressing this question, we examined intergenerational exchanges between the household head and wife and their parents and children in 2013 in households where the head had and had not ever been diagnosed with diabetes (Table 5). Separate models were estimated to examine upward and downward giving of support (time and money to parents and

children) and upward and downward receipt of support (time and money from parents and children). After adjusting for the age and gender of the household head, whether he or she was working, household income, number of surviving children and parents, urbanicity and census region, households with a diabetic head were generally less likely to give assistance to their parents and children and were not more likely to receive assistance from their parents and children. They were 20% less likely to give money to their children. There is some indication that they may receive more time and money from their children, but these relationships did not reach significance.

To better understand the ways in which a diabetes diagnosis may affect intergenerational exchanges, we then examine exchanges with parents and children among households in which the household head had been diagnosed within the previous 4 years compared with those in which the household head had never been diagnosed. We hypothesized that, after a diabetes diagnosis, the household head and wife would decrease their giving and their children would come forward to help; we found some evidence of this general pattern, but the only relationship that reached significance was lower odds of monetary gifts to children among families with a recent diagnosis.

Discussion

Diabetes is a progressive chronic disease that is increasingly prevalent in the U.S. People with diabetes are at risk of developing major health complications, which can include blindness, organ failure, and amputations. Diabetes can often be managed through careful lifestyle changes involving diet and physical activity, but can incur major medical costs. Given these major lifestyle, health, and financial implications of diabetes, the goal of this research was to examine the implications of diabetes for the family: how is diabetes associated with the family's financial wellbeing and exchanges between parents and children. Using the PSID, a national cohort of families with longitudinal data on diabetes and economic circumstances and with data on giving and

receiving, we found that families with a head with diabetes had poorer economic circumstances, especially lower wealth and employment rates. These poorer economic circumstances were not the result of recent economic shocks following a diabetes diagnosis. Families with a head with diabetes were less likely to give time or money to their parents and children. They were not significantly more likely to receive help from their parents or children, even in the years following a new diabetes diagnosis.

Table 1: Prevalence of households in which the head has been diagnosed with diabetes

	Percent/ Mean	SE
Year %		
1999	5.00	0.437
2001	6.88	0.503
2003	7.70	0.528
2005	8.92	0.559
2007	10.39	0.598
2009	12.30	0.647
2011	14.59	0.703
2013	15.86	0.727
New case 2009-13 %	4.59	0.434
Years spent with diabetes (mean) (among those with diabetes in 2013)	4.12	0.211

Table 2: Economic characteristics of U.S. households in which the head does and does not have diabetes, 2013

	Household head without diabetes (n=7,161)		Household head with diabetes (n=1,218)		T-test
	% or Mean	SE	% or Mean	SE	p-value
Demographic characteristics %					
Male head	68.45	0.723	64.45	2.10	0.073
Head age (years)	50.32	0.282	61.74	0.601	0.000
Wife age (years)	48.91	31.55	58.26	66.41	0.000
Urban	65.82	0.697	66.14	1.95	0.876
N-H white head	57.24	0.724	61.34	2.01	0.054
Economic characteristics %					
Head is employed	65.45	0.743	39.62	2.01	0.000
Weekly hours worked	40.68	1.369	29.03	3.187	0.001
Owns home	58.83	0.729	64.04	2.04	0.017
Has debts (2009)	52.33	0.835	50.51	2.21	0.442
Health insurance (2011)	89.36	4.805	91.62	1.185	0.077
Made charitable donations	58.02	0.733	60.54	2.035	0.244
Family income (mean $)	76,159.88	1775.029	60,202.53	2414.39	0.000
Family wealth incl. equity (mean $)	314,558.9	15252.9	332,256	76495.01	0.821
Household structure %					
Head is married	44.60	0.727	46.56	2.06	0.371
Number of co-residing children	.546	.0123	0.300	0.029	0.000
Number of living children	1.35	0.025	2.220	0.070	0.000
Number of living parents	1.20	0.015	0.635	0.032	0.000
Intergenerational support given (% for those with at least one living child/parent)					
Spends time helping parents	48.37	0.818	49.15	2.904	0.795
Gives money to parents	19.13	0.064	20.30	2.35	0.629
Spends time helping children	46.13	1.080	44.33	2.30	0.481
Gives money to children	47.96	1.092	39.00	2.257	0.000
Intergenerational support received					
Parents spend time helping	32.90	0.743	19.28	2.18	0.000
Receives money from parents	25.68	0.711	20.11	2.43	0.027
Children spend time helping	35.98	1.058	38.84	2.289	0.258
Receives money from children	12.17	0.749	15.11	1.752	0.123

N=9,032
Estimates are survey-adjusted.
** p<0.01, * p<0.05, + p<0.1

Table 3: Diabetes status of household head and household economic situation, 2013 (or most recent data wave)
Results from survey-adjusted multivariate linear regression (Models 1-2) and multivariate logistic regression (Models 4-6)

	(1) Family income2013 (logged)	(2) Family wealth withequity2013 (logged)	(3) Owns home 2013	(4) Is employed 2013	(5) Has debts 2009	(6) Makes donations2013
VARIABLES	Coefficients		Odds ratios			
Head has diabetes	-0.02	-0.43**	0.83	0.60**	1.07	1.02
	(0.039)	(0.098)	(0.103)	(0.070)	(0.128)	(0.112)
Male household head	0.77**	1.24**	3.42**	1.51**	0.75**	1.53**
	(0.039)	(0.096)	(0.337)	(0.159)	(0.070)	(0.140)
Head age (years)	0.01**	0.06**	1.05**	0.91**	0.97**	1.03**
	(0.002)	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)
White race	0.27**	0.82**	1.88**	1.61**	1.25*	2.05**
	(0.036)	(0.099)	(0.189)	(0.172)	(0.121)	(0.189)
Is working	0.83**	0.66**	2.23**	.	1.74**	2.20**
	(0.045)	(0.094)	(0.219)	(.)	(0.151)	(0.195)
Urban residence	0.21**	0.28**	0.91	1.20+	1.19*	1.39**
	(0.032)	(0.073)	(0.082)	(0.110)	(0.092)	(0.112)
Census region (ref: Northeast)						
North Central	-0.18**	-0.34**	1.05	0.87	0.92	0.77*
	(0.049)	(0.110)	(0.139)	(0.115)	(0.108)	(0.093)
South	-0.16**	-0.31**	1.21	0.89	1.06	0.87
	(0.047)	(0.104)	(0.160)	(0.115)	(0.121)	(0.104)
West	-0.09+	-0.08	0.88	0.96	0.86	0.85
	(0.053)	(0.113)	(0.118)	(0.134)	(0.106)	(0.107)
Number of co-residing children	0.09**	0.08*	1.23**	1.04	0.91*	1.13**
	(0.014)	(0.035)	(0.052)	(0.055)	(0.033)	(0.043)
Constant	9.28**	6.90**	0.05**	279.63**	4.06**	0.12**
	(0.120)	(0.278)	(0.015)	(88.676)	(0.993)	(0.034)

Estimates are survey-adjusted.
** $p<0.01$, * $p<0.05$, + $p<0.1$

Table 4: Subsequent economic shocks in 2009-13 among households in which the household head developed diabetes between 2005 and 2009

Results from survey-adjusted multivariate linear regression (Models 1-2) and multivariate logistic regression (Models 3-4)

	Income change 2009-13 (logged)	Wealth change 2009-13 (logged)	Lost home 2009-13	Stopped donating 2009-13	Stopped working 2009-13
Variables	Coefficients		Odds ratios		
Head developed diabetes in 2005-09	0.04	-0.16	0.59	0.61	0.83
	(0.172)	(0.264)	(0.428)	(0.286)	(0.325)
Male household head	0.63**	1.05**	0.47**	0.81	0.69**
	(0.074)	(0.097)	(0.089)	(0.118)	(0.089)
Head age (years)	-0.02**	0.03**	0.98**	1.06**	0.99*
	(0.002)	(0.003)	(0.008)	(0.006)	(0.004)
White race	0.13+	0.29**	0.90	0.68**	0.57**
	(0.070)	(0.090)	(0.159)	(0.090)	(0.070)
Urban residence	0.30**	0.34**	1.00	0.91	0.76*
	(0.064)	(0.083)	(0.159)	(0.115)	(0.085)
Census region (ref: Northeast)					
Central	-0.15+	-0.05	1.48	0.99	1.33+
	(0.091)	(0.127)	(0.389)	(0.188)	(0.223)
South	-0.09	-0.16	1.26	0.98	1.12
	(0.094)	(0.122)	(0.328)	(0.171)	(0.184)
West	-0.10	0.11	1.77*	1.07	1.18
	(0.095)	(0.132)	(0.496)	(0.204)	(0.210)
Number of co-residing children	0.05*	0.01	1.05	0.76**	0.95
	(0.023)	(0.034)	(0.079)	(0.058)	(0.051)
Constant	9.52**	7.81**	0.42	0.02**	0.83
	(0.154)	(0.201)	(0.230)	(0.007)	(0.249)

SE in parentheses
Estimates are survey-adjusted.
** $p < 0.01$, * $p < 0.05$, + $p < 0.1$

Table 4: Household head's diabetes status and probability of exchanges with parents and children, 2013
  Odds ratios from multivariate logistic regression models

VARIABLES	(1) Spent time helping parent[a]	(3) Gave money to parent[a]	(5) Spent time helping child[b]	(7) Gave money to child[b]	(2) Got time help from parent[a]	(4) Got money from parent[a]	(6) Got time help from child[b]	(8) Got money from child[b]
Head has diabetes	0.79+	0.94	1.14	0.78*	0.98	0.89	1.17	1.18
	(0.110)	(0.172)	(0.134)	(0.091)	(0.196)	(0.168)	(0.138)	(0.203)
Male head (years)	1.06	1.42*	0.89	1.06	0.80	0.93	0.33**	0.38**
	(0.132)	(0.232)	(0.113)	(0.128)	(0.118)	(0.144)	(0.038)	(0.057)
Head age	1.02**	1.00	0.95**	1.00	0.92**	0.98**	1.02**	1.01+
	(0.005)	(0.007)	(0.005)	(0.005)	(0.006)	(0.006)	(0.005)	(0.008)
White race	1.04	0.46**	1.21	0.92	1.53**	1.37*	0.95	0.53**
	(0.114)	(0.058)	(0.141)	(0.109)	(0.204)	(0.193)	(0.113)	(0.091)
Urban residence	0.96	1.63**	0.93	1.16	0.95	1.33*	0.77*	1.15
	(0.085)	(0.195)	(0.092)	(0.112)	(0.103)	(0.154)	(0.077)	(0.180)
Census region (ref: Northeast)								
North central	0.90	0.95	0.95	1.00	0.88	0.78	1.15	0.67+
	(0.116)	(0.165)	(0.136)	(0.144)	(0.138)	(0.122)	(0.169)	(0.151)
South	0.82	1.42*	0.68**	1.00	0.79	0.78	0.79+	0.78
	(0.103)	(0.233)	(0.094)	(0.140)	(0.122)	(0.119)	(0.114)	(0.158)
West	0.66**	1.65**	0.83	1.04	0.69*	0.71*	0.91	0.92
	(0.089)	(0.276)	(0.125)	(0.155)	(0.111)	(0.115)	(0.143)	(0.204)
Number of children	0.89**	1.06	1.02	0.87**	0.74**	0.91*	1.00	1.03
	(0.030)	(0.046)	(0.031)	(0.029)	(0.041)	(0.043)	(0.031)	(0.046)
Number of parents	0.93	0.89	0.97	1.03	1.02	0.98	1.21**	0.71**
	(0.054)	(0.065)	(0.062)	(0.064)	(0.068)	(0.070)	(0.078)	(0.076)
Head is employed	0.93	1.55**	1.09	1.00	0.92	0.81+	0.94	1.11
	(0.097)	(0.221)	(0.127)	(0.112)	(0.128)	(0.105)	(0.104)	(0.188)
Household income	1.00*	1.00*	1.00	1.00**	1.00	1.00	1.00	1.00
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.74	0.15**	16.59**	0.70	21.21**	0.89	0.43*	0.20**
	(0.234)	(0.065)	(6.474)	(0.266)	(8.032)	(0.351)	(0.167)	(0.109)
Observations	3,903	3,903	3,531	3,531	3,903	3,903	3,531	3,510

[a] Only estimated for those under age 80 years with at least 1 living parent (includes parents of the household head and the wife)

[b] Only estimated for those over age 20 years with at least 1 living adult child (includes children of the household head and the wife)

SE in parentheses

** p<0.01, * p<0.05, + p<0.1

Table 5: Exchanges between households and children associated with diabetes diagnosis of the spouse during the previous 4 years

VARIABLES	(1) Spent time helping parent[a]	(3) Gave money to parent[a]	(5) Spent time helping child[b]	(7) Gave money to child[b]	(2) Got time help from parent[a]	(4) Got money from parent[a]	(6) Got time help from child[b]	(8) Got money from child[b]
Head developed diabetes in 2009-13	0.93	0.87	0.91	0.65+	0.88	0.73	1.06	1.35
	(0.228)	(0.314)	(0.201)	(0.157)	(0.320)	(0.261)	(0.241)	(0.444)
Male head	1.09	1.41*	0.93	0.97	0.77+	0.95	0.36**	0.39**
	(0.141)	(0.243)	(0.127)	(0.126)	(0.119)	(0.153)	(0.044)	(0.064)
Head age (years)	1.02**	1.00	0.95**	1.00	0.92**	0.98**	1.02**	1.01
	(0.006)	(0.008)	(0.005)	(0.006)	(0.007)	(0.007)	(0.006)	(0.008)
White race	1.03	0.46**	1.19	0.93	1.49**	1.35*	0.85	0.48**
	(0.119)	(0.061)	(0.155)	(0.121)	(0.207)	(0.198)	(0.113)	(0.094)
Urban residence	0.97	1.64**	0.96	1.16	0.92	1.41**	0.74**	1.06
	(0.090)	(0.206)	(0.104)	(0.121)	(0.103)	(0.168)	(0.081)	(0.183)
Census region (ref: Northeast)								
North central	0.88	0.90	1.00	1.02	0.84	0.88	1.10	0.65+
	(0.118)	(0.165)	(0.155)	(0.159)	(0.137)	(0.143)	(0.175)	(0.158)
South	0.82	1.44*	0.72*	1.03	0.74+	0.82	0.72*	0.72
	(0.108)	(0.247)	(0.110)	(0.157)	(0.118)	(0.130)	(0.115)	(0.162)
West	0.67**	1.72**	0.88	1.11	0.64**	0.80	0.91	0.94
	(0.094)	(0.300)	(0.143)	(0.180)	(0.108)	(0.134)	(0.156)	(0.228)
Number of children	0.89**	1.06	1.03	0.87**	0.74**	0.90+	1.02	1.00
Number of parents	(0.032)	(0.050)	(0.036)	(0.032)	(0.044)	(0.047)	(0.035)	(0.053)
Head is employed	0.89+	0.88	1.01	1.05	1.03	0.98	1.20**	0.68**
	(0.054)	(0.068)	(0.068)	(0.069)	(0.071)	(0.072)	(0.083)	(0.078)
Household income	1.00*	1.00+	1.00	1.00**	1.00	1.00	1.00	1.00*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.80	0.15**	12.76**	0.73	23.96**	0.81	0.48+	0.27*
	(0.261)	(0.069)	(5.381)	(0.302)	(9.517)	(0.328)	(0.201)	(0.158)
Observations	3,620	3,620	3,024	3,024	3,620	3,620	3,024	3,005

[a] Only estimated for those under age 80 years with at least 1 living parent (includes parents of the household head and the wife)

[b] Only estimated for those over age 20 years with at least 1 living adult child (includes children of the household head and the wife)

SE in parentheses

Estimates are survey-adjusted.

** p<0.01, * p<0.05, + p<0.1

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