

Nature vs. Nurture

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Holt International Adoption Services

- “Holt International Children’s Services is dedicated to carrying out God’s plan for every child to have a permanent, loving family.”
- “...develop and maintain programs overseas to give orphaned, abandoned and vulnerable children safe and nurturing environments in which to develop.”

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- Start by Harry and Bertha Holt
- Sought to aid American children in Korean orphanages
- Adopted 8 children themselves
- Had to have special legislation passed

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- Started the agency in 1956
- Largest adoption agency – placing 40K children
- Place 300 kids/year from a variety of countries

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Adoptions process

- Takes 12-18 months
- Application, home study, criminal check, adoption classes, adoptee comes to the US, adopted in family court
- Adoptions covered by US/Korean laws
- Parents must have
 - >125% of FPL
 - Adoptive parents 25-45 years of age
 - No more than 4 kids in house

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- Holt adoptions are first come, first serve
- Timing of when application completed determines
- Therefore, placement of children into household is quasi random
- Parents cannot specify gender of a child, but families with all boys or girls can request a child of the opposite sex
- After assignment, takes 4.5 months for the child to come home

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Data

- Survey of children placed by Holt 1964-85
- Data from Holt records and survey conducted 2004/5
- Target of sample were adoptees aged 24-34 but collected data on all adoptees
- Low response rate (34%)
- Relied on parents' responses about outcomes for adult children

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Scarr and Weinberg, 1978

Table 3. Unstandardized Regression Coefficients of Adolescent IQ on Family Demographic Characteristics and Parental IQ in Biologically-Related and Adoptive Families

	Bio.	Adopt.	Bio.	Adopt.	Bio.	Adopt.	Adopt.	Adopt.
Family Characteristics/N	237	150	237	150	237	150	150	132
Father's Education	.855	+	.795	+	.262	-.153	-.248	-.074
Mother's Education	.551	.362	.465	.343	-.525	.378	.336	.282
Father's Occupation	-.065	.040	-.069	.038	-.059	.032	.035	.014
Family Income	.170	-.020	.160	.010	.100	-.020	-.090	-.085
Birth Rank			-2.699	-3.063	-2.724	-3.078	-3.419	-4.077
Number of Children			.720	.303	.751	.390	.578	.605
Father's IQ					.274	.125	.115	.091
Mother's IQ					.357	-.020	*	-.021
Natural Mother's Education							1.325	1.554
Natural Mother's Age							-.226	-.121
Natural Mother's Occupation								.009
R ²	.107	.019	.145	.059	.309	.075	.138	.157

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Plug and Vijverberg, 2003

TABLE 4
ESTIMATES OF THE CHILD'S SCHOOLING MODEL: ADJUSTING FOR ABILITY EFFECTS THAT RUN THROUGH INCOME

	YEARS OF EDUCATION		COLLEGE ATTENDANCE	
	(1)	(2)	(3)	(4)
Intercept	14.726 (.259)***	14.743 (.256)***	1.707 (.159)***	1.704 (.156)**
Daughter	.156 (.035)***	.150 (.034)***	.147 (.021)***	.140 (.021)**
Age	-.153 (.006)***	-.153 (.006)***	-.116 (.003)***	-.116 (.003)**
Adoptee	1.650 (.769)**	1.611 (.741)**	.674 (.477)	.621 (.469)
IQ of parent (b_1c_1)	.408 (.016)***	.409 (.015)***	.191 (.010)***	.194 (.010)**
Adoptee \times IQ of parent ($-b_4c_1$)	-.241 (.072)***	-.241 (.070)***	-.104 (.045)**	-.102 (.043)**
Log ability-free income	.320 (.037)***		.150 (.022)***	

Holt Data

TABLE 1
EVIDENCE OF RANDOM ASSIGNMENT USING ADMINISTRATIVE RECORDS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Adoptee's age at arrival in US	Weight when entered Holt system (lb)	Height when entered Holt system (inches)	Adoptee is male	Birth mother was married	Birth mother's age at adoptee's birth	Birth mother highest grade completed
Log family income	0.001 (0.127) ^a	0.310 (0.258)	0.188 (0.225)	0.017 (0.022)	0.060 (0.081)	0.556 (1.784)	0.171 (0.968)
Father's years of education	-0.006 (0.010)	0.009 (0.043)	-0.019 (0.036)	0.006 (0.004)	-0.007 (0.015)	0.358 (0.376)	-0.094 (0.158)
Mother's years of education	-0.018 (0.015)	-0.037 (0.067)	0.014 (0.040)	0.003 (0.005)	0.001 (0.019)	-0.128 (0.545)	0.159 (0.172)
Log (median income in zip code in 1980)	0.145 (0.203)	0.201 (0.285)	0.149 (0.232)	-0.041 (0.029)	0.061 (0.111)	-3.422 (2.523)	-0.119 (1.106)
Observations	2158	2156	2157	2161	126	99	81
B-squared	0.143	0.704	0.640			0.232	0.345
F or χ^2 test for parental coeffs = 0							
$p > F$, $p > \chi^2$	1.10	0.72	0.48	6.47	1.48	0.88	0.23
	0.354	0.580	0.753	0.166	0.830	0.479	0.920

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TABLE III
SUMMARY STATISTICS

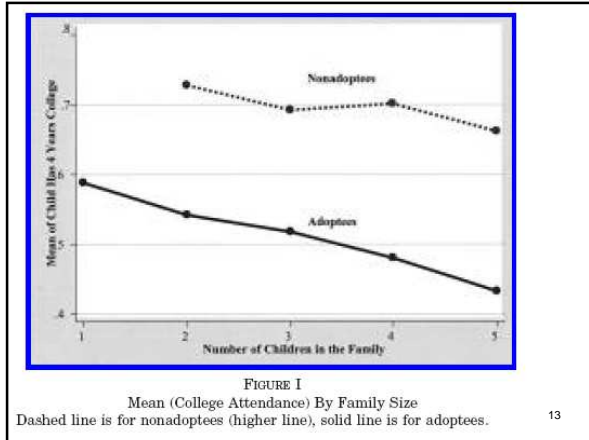
Variable	Adoptees			Nonadoptees	
	Obs	Mean	Std. dev.	Obs	Mean
For the children					
Child is male	1650	0.295	0.456	1196	0.622
Child's current age	1650	28.215	4.557	1196	32.292
Child's age at arrival in US	1640	1.369	0.826		
Child's years of education	1256	15.088	2.153	1051	15.914
Child has 4+ years college	1256	0.576	0.494	1051	0.713
Child graduated from a US News ranked college	1256	0.373	0.484	1051	0.469
Acceptance rate of college	725	0.697	0.174	598	0.672
Child's family income	1209	49.268	35.141	1025	64.239
Log (child's family income)	1209	3.648	0.740	1025	3.932
Child is married	1642	0.386	0.487	1156	0.633
Child's number of children	1562	0.520	0.905	1125	1.083
Child's BMI	1590	23.113	3.733	1130	24.007
Child is overweight	1590	0.240	0.427	1130	0.343
Child is obese	1590	0.061	0.239	1130	0.061
Child smokes	1649	0.230	0.421	1161	0.115
Child drinks	1635	0.593	0.491	1149	0.687
Child ever had asthma	1650	0.089	0.285	1188	0.089

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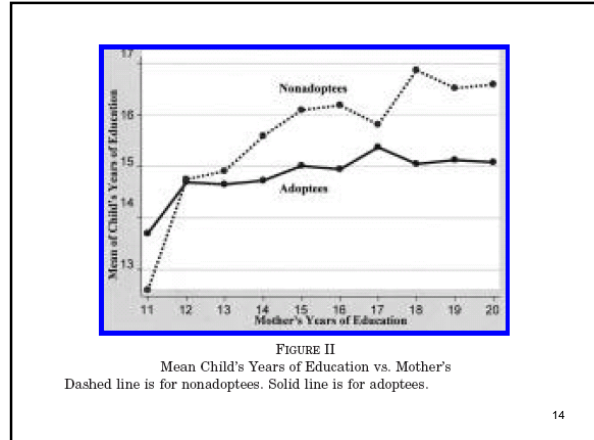
TABLE III
SUMMARY STATISTICS

Variable	Adoptees			Nonadoptees	
	Obs	Mean	Std. dev.	Obs	Mean
For the parents					
Mother's years of education	1650	15.122	2.456	1180	15.285
Mother has 4+ years college	1650	0.528	0.499	1188	0.547
Father's years of education	1625	15.908	2.879	1171	16.272
Father has 4+ years college	1650	0.618	0.486	1179	0.673
Income at time of adoption (survey)	1624	32.472	23.646	1166	33.649
Income at time of adoption (Holt records)	1218	16817.780	9893.756	939	16675.520
Log family income (Holt records)	1216	9.591	0.534	935	9.581
Mother is overweight	1574	0.463	0.499	1132	0.436
Mother smokes	1629	0.033	0.177	1162	0.023
Mother drinks	1624	0.526	0.499	1161	0.571
Both parents have college degrees and family has three or fewer children	1627	0.273	0.446	1170	0.232
Neither parent has a college degree and family has four or more children	1627	0.128	0.334	1170	0.170

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TABLE VIII
TRANSMISSION COEFFICIENTS FROM PARENTS TO CHILDREN FOR ADOPTEEES AND NONADOPTEEES

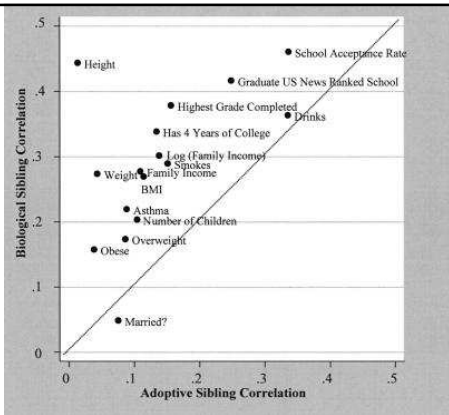
	(1) Adoptees' Transmission coefficient	(2) Nonadoptees' transmission coefficient
Years of education (mother to child)	0.089 (0.029) ^a **	0.315 (0.038)**
Has 4+ years college (mother to child)	0.102 (0.034)**	0.302 (0.037)**
Log household income (parents to child)	0.186 (0.111)	0.246 (0.080)**
Height inches (mother to child)	-0.004 (0.034)	0.491 (0.049)**
Is obese (mother to child)	0.003 (0.020)	0.108 (0.034)**
Is overweight (mother to child)	-0.026 (0.029)	0.174 (0.037)**
BMI (mother to child)	0.002 (0.025)	0.221 (0.045)**
Smokes (0-1) (mother to child)	0.132 (0.088)	0.108 (0.115)
Drinks (0-1) (mother to child)	0.210 (0.033)**	0.244 (0.038)**

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TABLE IV
CORRELATIONS IN OUTCOMES AMONG PAIRS OF ADOPTIVE SIBLINGS AND PAIRS OF BIOLOGICAL SIBLINGS

Outcome	Adoptive sibling correlation	Biological sibling correlation	N Adoptive	N Biological
Has 4 years of college	0.135	0.338	1360	578
Highest grade completed	0.157	0.378	1360	578
Family income	0.110	0.277	1314	554
Log (family income)	0.139	0.301	1314	554
Drinks	0.336	0.363	1903	640
Smokes	0.152	0.289	1938	654
Height	0.014	0.443	1910	646
Weight	0.044	0.273	1822	629
BMI	0.115	0.269	1821	629
Overweight	0.087	0.173	1821	629
Attended US News ranked school	0.249	0.416	1360	578
Acceptance rate of school	0.337	0.460	560	245
Married	0.076	0.048	1917	650
Number of children	0.105	0.203	1802	633

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TABLE V
PROPORTION OF OUTCOME VARIANCE EXPLAINED BY HERITABILITY, SHARED FAMILY ENVIRONMENT, AND NON-SHARED ENVIRONMENT USING A SIMPLE BEHAVIORAL GENETICS MODEL

Outcome	Proportion explained by nurture (shared family environment)	Proportion explained by nature (heritability)	Unexplained portion (non-shared environment)
Has 4 years of college	0.135	0.406	0.459
Highest grade completed	0.157	0.443	0.400
Family income	0.110	0.334	0.556
Log (family income)	0.139	0.324	0.537
Drinks	0.336	0.055	0.609
Smokes	0.152	0.273	0.575
Height	0.014	0.858	0.128
Weight	0.044	0.458	0.498
BMI	0.115	0.308	0.577
Overweight	0.087	0.172	0.741
Attended US News ranked school	0.249	0.335	0.417
Acceptance rate of school	0.337	0.245	0.418
Married	0.076	-0.056	0.979
Number of children	0.105	0.196	0.699

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