

University of Illinois - Department of Economics
Economics 545: Economics of Education, Health and Human Capital

Professor Elizabeth Powers
Fall 2006

Course Objectives

Human capital is the collection of attributes that an individual combines with their own effort to produce output, whether valued explicitly in a formal market or not. Education and health are major determinants of the stock of human capital. This course provides an introduction to the economic theory of human capital and its application in the study of various topics, which may include fertility, discrimination, education, health, and migration. Students will learn the basic theory underlying these topics and various empirical approaches to hypothesis testing.

Class Meetings

Tuesdays and Thursdays, 10:00 a.m.-11:50 a.m., 222 David Kinley Hall, August 24, 2006 through December 7, 2006.

Required Course Materials

Book chapters, journal articles, and working papers are assigned. There is no textbook. Most assigned articles are available in electronic form. Older articles from the major economics journals are available from the web site JSTOR (www.jstor.org). Assigned working papers are available from the Social Science Research Network or NBER web sites. These downloads are free to students with a University of Illinois affiliation. The journals are also available in hardcopy in the library. Book chapters and other harder-to-find items are on reserve in the Business & Economics Library.

Other Resources

I strongly recommend the netcourses in the Stata statistical package that are offered by Stata Corp. through its website (www.stata.com).

Course Prerequisites

The official requirements are a course in microeconomic theory and a course in statistics. Unofficially, it is helpful to know that this course is aimed primarily at Ph.D. students in economics or closely related fields who are interested in writing a dissertation with a substantial empirical component.

Grades

The course grade will be determined by the total points earned over the semester. I use a four-point grading scale with pluses and minuses.

Class Rules

Successful students come to class prepared. Students with excessive absences will be reported to the college dean, in accordance the Code of Policies and Regulations Applying to All Students (Section 34).

I do not provide opportunities to make up missed exams or assignments. In particular, late assignments will not be accepted and extra credit opportunities will not be extended in lieu of scheduled assignments. Exceptions will be granted only under special circumstances, such as excused medical absences as defined in the Code of Policies and Regulations Applying to All Students (Section 34).

Consistent with University policy, violations of academic integrity will be considered a serious offense. A student who is discovered to have violated academic integrity in this course will be subject to the penalties discussed in Section 33 of the Code of Policies and Regulations Applying to All Students. Examples of penalties which may be imposed include a failing grade for the course.

Collaborative learning activities are encouraged, but activities such as copying from classmates' assignments or plagiarism constitute academic integrity violations.

Special Needs

Please contact me by the second class if you will require accommodation for special learning needs.

Class Web Site

Your primary source of information about the class is the class web site. Check it frequently for updates and announcements at <https://netfiles.uiuc.edu/epowers/www/>.

Office Hours and Contact Information

Office hours are on Mondays from 3:00-4:30 p.m., on Tuesdays from 3-4:30 p.m., or by appointment. My office is #231 in the Institute of Government and Public Affairs Building at 1007 W. Nevada Street. E-mail is the preferred method of first contact for most matters (epowers@uiuc.edu). For urgent situations, my office phone number is 244-4818.

Course Requirements

You will be graded on four items, each worth 25 percent of the course grade:

- (1) **A mock/practice referee report.** The objective is to think critically about what makes a paper good and how to make a paper better and to express your views clearly and concisely.
- (2) **Participation in class discussions and a required in-class presentation.** You are expected to read assigned materials before class and arrive prepared for discussion. You may also be assigned papers from some of the economics department seminars in the labor, development, and public fields as appropriate. Each student will also be asked to lead an in-class discussion of a paper. You will prepare a one-page handout with discussion points and lead a 20-minute discussion.

(3) **A written paper proposal.** The goal is to develop a well-defined paper topic, convince yourself and others that it is sufficiently interesting for you to devote your time to, and think through potential pitfalls in concept and implementation before starting the actual research. For empirical research, arguing for the appropriateness of the data source and including exploratory empirical work in support is critical. For theoretical research, you must demonstrate a good understanding of the theoretical grounding and explore solution techniques for feasibility.

(4) **A final exam.** The final will test your understanding of the theory of human capital and your knowledge of the literature.

Course Outline
Economics 545, Education, Health, and Human Capital
Fall 2006

- I. Introduction to Human Capital Theory
- II. Parental Investment in Children
 - A. The quantity-quality fertility model
 - i. An application to welfare programs
 - B. The investment decision
 - i. Basic theory
 - ii. Heterogeneous children
 - C. Intergenerational income mobility and inequality
- III. Fertility and Economic Development
- IV. Family Structure, Work, and Earnings
 - A. Impacts of children on parental earnings
 - B. Impact of family structure on children's adult earnings
- V. Investment in and Returns to Education
 - A. Investment in education and "ability bias"
 - B. Returns to education: introduction and overview
 - C. Returns to education: early approaches
 - D. Returns to education: twin/sibling models
 - i. Some examples
 - ii. Critiques
 - E. Returns to education: other approaches
 - i. Some examples
 - ii. Critiques of alternative approaches
 - F. Returns to education: variation by type of educational institution
 - G. Returns to education: variation by race and sex
- VI. Education Policy: Does Money Matter?
 - A. Introduction
 - B. Money doesn't matter
 - C. Money matters
- VII. Education and Economic Development
- VIII. Health and Human Capital
 - A. The demand for health and determinants of health
 - B. Determinants of children's health
 - C. Adult health, work, and earnings
 - D. Health and economic development
- IX. Aging
- X. Human Capital and Aggregate Growth: "Endogenous Growth" Models

Reading List
Economics 545, Education, Health, and Human Capital
Fall 2006

KEY: *on reserve in undergraduate library; ► required reading.

I. Introduction: Human Capital Theory

► Becker, Gary S., 1993, "Nobel Lecture: The Economic Way of Looking at Behavior," *Journal of Political Economy* 101(3), 385-409.

► Gary S. Becker, "Investment in Human Capital: A Theoretical Analysis," 1962. *Journal of Political Economy*, Vol. 70(5, Part 2: Investment in Human Beings.; October), 9-49.

II. Parental Investment in Children

A. The Quantity-Quality Fertility Model

► Rosenzweig, Mark R., and Wolpin, Kenneth I., 1980, "Testing the Quantity-Quality Fertility Model: The Use of Twins as a Natural Experiment." *Econometrica* 48(1), 227-40.

► Hanushek, Eric A., 1992, "The Trade-Off between Child Quantity and Quality." *Journal of Political Economy* 100 (February), 84-117.

► Angrist, Joshua D., Victor Lavy, and Analia Schlosser, 2005. "New Evidence on the Causal Link between the Quantity and Quality of Children." NBER Working paper #11835.

*Hotz, V. Joseph, Jacob Alex Klerman, and Robert J. Willis, "The Economics of Fertility in Developed Countries," 1998. Chapter 7 of the *Handbook of Population Economics* (V. 1A), Rosenzweig and Stark, editors.

*Becker, Gary, "The Demand for Children" Chapter 5 in *A Treatise on the Family*.

i. An application to welfare programs

► Rosenzweig, Mark R., 1999. "Welfare, Marital Prospects, and Nonmarital Childbearing", *Journal of Political Economy* v107(6-Part 2; Dec.), S3-32.

► Foster, E. Michael, and Saul D Hoffman, 2000. "AFDC Benefits and Nonmarital Births to Young Women," *Journal of Human Resources* 35(2, Spring), 376-91.

B. The investment decision

► Behrman, Jere R., Robert A. Pollack, and Paul Taubman, 1982. "Parental Preferences and Provision for Progeny," *Journal of Political Economy* 90(1, Feb.), 52-73.

► Jere R. Behrman, Mark R. Rosenzweig, and Paul Taubman, 1994. "Endowments and the Allocation of Schooling in the Family and in the Marriage Market: The Twins Experiment," *Journal of Political Economy* 102(6, Dec.), 1131-1174.

► Case, Anne, and Christina Paxson, 2001. "Mothers and Others: Who Invests in Children's Health?" *Journal of Health Economics* 20(3, May), 301-28.

► Butcher, Kristen, and Anne Case, 1994. "The Effect of Sibling Sex Composition on Women's Education and Earnings," *Quarterly Journal of Economics* 104(3, August), 531-63.

*Becker, Gary, "Family Background and the Opportunities of Children," in *A Treatise on the Family*.

*Behrman, Jere R., "Intrahousehold Distribution and the Family," 1998. Chapter 4 in Volume 1A, *Handbook of Population and Family Economics*, Rosenzweig and Stark, editors. (See especially sections 2.1, 3.2)

Behrman, Jere R., and Mark R. Rosenzweig, 2004. "Parental Allocations to Children: New Evidence on Bequest Differences among Siblings." *Review of Economics and Statistics* 86 (2, May), pp. 637-40.

Haveman, Robert, and Wolfe, Barbara, 1995, "The Determinants of Children's Attainments: A Review of Methods and Findings." *Journal of Economic Literature* 33, 1829-1878.

Rose, Elaina, 1999, "Consumption Smoothing and Excess Female Mortality in Rural India," *Review of Economics and Statistics*, February.

C. Intergenerational Income Mobility and Inequality

► Behrman, Jere R., and Paul Taubman, 1990. "The Intergenerational Correlation between Children's Adult Earnings and their Parents' Income: Results from the Michigan Panel Survey of Income Dynamics." *Review of Income and Wealth* 36 (2), 115-27.

► Mazumder, Bhashkar, 2005. "Earnings Mobility in the US: A New Look at Intergenerational Inequality." *Review of Economics and Statistics* 82 (2, May), 235-55.

*Solon, Gary, 1999, "Intergenerational Mobility in the Labor Market," Chapter 29 in *Handbook of Labor Economics*, V. 3a.

III. Fertility and Economic Development

Galor, Oded and David N. Weil, 1996. "The Gender Gap, Fertility and Growth." *American Economic Review* 86 (3, June), 374-87.

Weil, David, 2005. "Accounting for the Effect of Health on Economic Growth." NBER Working Paper #11455.

Bloom, David E. and David Canning, "The Health and Wealth of Nations." *Science* 287, 2/18/2000, pp. 1207-1209.

Fogel, Robert W., "Economic Growth, Population Theory, and Physiology: The Bearing of Long-Term Processes on the Making of Economic Policy." *American Economic Review* 83:3, June 1994, 369-395.

IV. Family Structure, Work, and Earnings

*Becker, "Division of Labor in Households and Families," chapter 2 in *A Treatise on the Family*.

A. Impacts of children on parental earnings

► Angrist, Joshua, D., and Evans, William M., 1998, "Children and their parents' Labor Supply: Evidence from Exogenous Variation in Family Size." *American Economic Review* 88(3), 450-77.

► Korenman, Sanders, and David Neumark, 1991. "Does Marriage Really Make Men More Productive?" *Journal of Human Resources* 26(2), 282-307.

► Waldfogel, Jane, 1998, "Understanding the 'family gap' in pay for women with children," *Journal of Economic Perspectives* 12(1).

V. Investment in Education and the Return to Education

A. Education investment and "ability bias"

► Willis, Robert J., and Sherwin Rosen, 1979. "Education and Self-Selection," *The Journal of Political Economy* 87(5, Part 2: Education and Income Distribution; Oct.), S7-S36.

► Cameron, Stephen V. and James J. Heckman, 2003. "The Dynamics of Educational Attainment for Blacks, Hispanics, and Whites," *The Economics of Schooling and School Quality, Volume 1: Labor Markets, Distribution, and Growth*, pp. 262-306. Elgar Reference Collection, International Library of Critical Writings in Economics vol. 159, Chettenham, U.K., and Northampton, Mass.

► Goldin, Claudia, and Katz, Lawrence F., 2002. "The Power of the Pill: Oral Contraceptives and Women's Career and Marriage Decisions," *Journal of Political Economy* 110 (4, August), 730-70.

Jere R. Behrman, Robert A. Pollack, and Paul Taubman, 1989. "Family Resources, Family Size, and Access to Financing for College Education," *The Journal of Political Economy* 97(2, April), 398-419.

B. Returns to education: introduction and overview

► *Card, David, "The Causal Effect of Education on Earnings," 1999. *Handbook of Labor Economics* Volume 3a, Chapter 30.

*Angrist, Joshua D., and Krueger, Alan B., 1999. "Empirical Strategies in Labor Economics," *Handbook of Labor Economics*, Vol. 3 Ashenfelter and Card, eds.

C. Returns to education: early approaches

► Griliches, Zvi, and Mason, William M., 1972. "Education, Income and Ability," *Journal of Political Economy* 80(3), Part II, S74-S103.

► Griliches, Zvi, 1977. "Estimating the Returns to Schooling: Some Econometric Problems" *Econometrica* 45 (1, Jan.), 1-22.

Cardell, Nicholas Scott, and Hopkins, Mark Myron, 1977. "Education, Income and Ability: A Comment," *Journal of Political Economy* 85 (1, February), 211-215.

Griliches, Zvi, 1977. "Education, Income, and Ability: Rejoinder," *Journal of Political Economy* 85(1), p. 215.

D. Returns to education: twin/sibling models

i. Some examples

► Griliches, Zvi, 1979, "Sibling Models and Data in Economics: Beginnings of a Survey," *The Journal of Political Economy* 87 (5, Part 2: Education and Income Distribution; October), S37-S64.

► Ashenfelter, Orley, and Krueger, Alan, "Estimates of the Economic Return to Schooling from a New Sample of Twins," 1994, *The American Economic Review*, Vol. 84, No. 5. (Dec.), pp. 1157-1173.

Behrman, Jere R., and Mark R. Rosenzweig, 1999. "'Ability' Biases in Schooling Returns and Twins: A Test and New Estimates," *Economics of Education Review* 18(2), 159-67.

ii. Critiques

► Neumark, David, 1999. "Biases in Twin Estimates of the Return to Schooling," *Economics of Education Review* 18, (2, April), 143-48.

► Bound, John, and Solon, Gary, 1999. "Double Trouble: On the Value of Twins-Based Estimation of the Return to Schooling." *Economics of Education Review* 18 (2, April), 169-82.

Rosenzweig, Mark R., and Kenneth I. Wolpin, 2000. "Natural 'Natural Experiments' in Economics," *Journal of Economic Literature* 38 (December), 827-874.

E. Returns to education: other approaches
i. Some examples

► Angrist, Joshua D., Krueger, Alan B., 1991, "Does Compulsory School Attendance Affect Schooling and Earnings?" *Quarterly Journal of Economics* v106, n4 (November 1991): 979-1014

► Acemoglu, Daron, and Joshua Angrist, 1999. "How Large are the Social Returns to Education? Evidence from Compulsory Schooling Laws." NBER Working Paper #W7444 (October). Also appears in *Recent Developments in Growth Theory, Volume 1: Empirical Patterns*, 2004, pp. 387-437. Elgar Reference Collection, International Library of Critical Writings in Economics, Vol. 179, Chettenham, U.K., and Northampton, Mass., Elgar.

*Card, David, "Earnings, Schooling, and Ability Revisited," *Research in Labor Economics* 14 (1995), 23-48.

ii. Critiques

► Bound, John, David A. Jaeger, and Regina M. Baker, 1995. "Problems with Instrumental Variables Estimation When the Correlation between the Instruments and the Endogenous Explanatory Variable Is Weak." *Journal of the American Statistical Association* 90(430, June), 443-50.

Bound, John, and Alan Krueger, 1991. "The Extent of Measurement Error in Longitudinal Earnings Data: Do Two Wrongs Make a Right?" *Journal of Labor Economics* 9, 1-24.

F. Returns to education: variation by type of educational institution

► Kane, Thomas J., and Cecilia Elena Rouse, 1995. "Labor Market Returns to Two and Four-year College." *American Economic Review* 85 (3), 600-614.

► Brewer, Dominic J., Eric R. Eide, and Ronald G. Ehrenberg, 1999. "Does It Pay to Attend an Elite Private College? Cross-Cohort Evidence on the Effects of College Type on Earnings" *Journal of Human Resources* 34, (1, Winter), 104-23

Kane, Thomas J., and Cecilia Elena Rouse, 1999. "The Community College: Educating Students at the Margin between College and Work." *Journal of Economic Perspectives* 13 (1, Winter), 63-84.

G. Returns to education: variation by race and sex

► Card, David, and Alan B. Krueger, 1992. "School Quality and Black-White Relative Earnings: A Direct Assessment," *Quarterly Journal of Economics* 107 (February) 151-200.

* Cain, Glen G., "The Economic Analysis of Labor Market Discrimination: A Survey" *Handbook of Labor Economics* Volume 1, Chapter 13.

**Handbook of Labor Economics* Volume 3c, Chapter 48, "Race and Gender in the Labor Market" Joseph G. Altonji and Rebecca M. Blank, 1999.

Heckman, James J., Thomas M. Lyons, and Petra E. Todd, 2000. "Understanding Black-White Wage Differentials: 1960-1990." *American Economic Association Papers and Proceedings* (May).

VI. Education Policy: Does Money Matter?

A. Introduction

*Burtless, Gary, 1996, Introduction and Summary, *Does Money Matter? The Effect of School Resources on Student Achievement and Adult Success* (Brookings Institution Press, Washington, DC).

B. Money doesn't matter

► Hanushek, Eric A., 1996, "School Resources and Student Performance," Chapter 2 in *Does Money Matter? The Effect of School Resources on Student Achievement and Adult Success* (Brookings Institution Press, Washington, DC).

Hanushek, Eric A., 1986, "The Economics of Schooling: Production and Efficiency in Public Schools." *Journal of Economic Literature* 24 (September) 1141-77.

i. If not, why?

► Angrist, Joshua, and Guryan, Jonathan, 2003, "Does Teacher Testing Raise Teacher Quality? Evidence from State Certification Requirements." NBER Working Paper #w9545 (March).

Ballou, Dale, 1996, "Do Public Schools Hire the Best Applicants?" *Quarterly Journal of Economics* (February)

Hanushek, Eric A., Kain, John F., and Rivkin, Steven G., 1999, "Do Higher Salaries buy Better Teachers?" NBER Working Paper 7082 (April).

C. Money matters

► Card, David, and Alan B. Krueger, 1992, "Does School Quality Matter? Returns to Education and the Characteristics of Public schools in the United States," *Journal of Political Economy* 100 (February): 1-40.

► Betts, Julian R., 1995, "Does School Quality matter? Evidence from the National Longitudinal Survey of Youth." *Review of Economics and Statistics* 77 (May): 231-50.

► Angrist, Joshua, and Victor Lavy, 1999, "Using Maimonides' Rule to Estimate the Effect of Class Size on Scholastic Achievement," *Quarterly Journal of Economics* (May).

*Card, David, and Krueger, Alan B., "Labor Market Effects of School Quality: Theory and Evidence," Chapter 5 in *Does Money Matter? The Effect of School Resources on Student Achievement and Adult Success* (Brookings Institution Press, Washington , DC). [also NBER #5450]

*Betts, Julian R., 1996, "Is there a link between school inputs and earnings? Fresh Scrutiny of an old literature." Chapter 6 in *Does Money Matter? The Effect of School Resources on Student Achievement and Adult Success* (Brookings Institution Press, Washington , DC).

*Heckman, James, Layne-Farra, Anne, and Todd, Petra, 1996, "Does Measured School Quality Really Matter? An Examination of the Earnings-Quality Relationship," Chapter 7 in *Does Money Matter? The Effect of School Resources on Student Achievement and Adult Success* (Brookings Institution Press, Washington , DC).

Guryan, Jonathan, 2000, "Does Money Matter? Regression-Discontinuity Estimates from Education Finance Reform in Massachusetts." Mimeo.

Card, David, and A. Abigail Payne, 2002, "School Finance Reform, the Distribution of School Spending, and the Distribution of Student Test Scores." *Journal of Public Economics*, 83 (1, January), 49-82.

Loeb, Susanna, and Marianne E. Page, 2000, "Examining the Link between Teacher Wages and Student Outcomes: The Importance of Alternative Labor Market Opportunities and Non-Pecuniary Variation." *The Review of Economics and Statistics* 82(3), 393-408.

VII. Education and Economic Development

► Bils, Mark, and Peter J. Klenow, , "Does Schooling Cause Growth?" *American Economic Review* 90 (5), 1160-1183.

► Hanushek, Eric A., and Dennis D. Kimko, "Schooling, Labor-Force Quality, and the Growth of Nations." *American Economic Review* 90 (5).

► Moretti, Enrico, 2003, "Human Capital Externalities in Cities." NBER Working Paper # W9641 (April).

*Topel, Robert, "Labor Markets and Economic Growth," *Handbook of Labor Economics Vol 3*, Ashenfelter and Card, eds., 2944-2981.

Owen, Ann L., Weil, David N., 1998, "Intergenerational Earnings Mobility, Inequality, and Growth," *Journal of Monetary Economics* 41 (1, February), 71-104 (also National Bureau of Economic Research Working Paper: 6070, 1997).

VIII. Health and Human Capital

A. The Demand for health and determinants of health

► Grossman, 1972, "On the Concept of Health Capital and the Demand for Health." *Journal of Political Economy* 80: 223-255.

► Becker, Gary S., and Murphy, Kevin M., 1988, "A Theory of Rational Addiction." *Journal of Political Economy* 96 (4) (August), 675-700.

► Smith, James, 1999, "Healthy Bodies and Thick Wallets: The Dual Relations between Health and Economic Status." *Journal of Economic Perspectives* 13(2): 145-166.

► Ettner, Susan L., 1996, "New Evidence on the Relationship between Income and Health" *Journal of Health Economics* 15 (1, February): 67-85

Becker, Gary S., Michael Grossman, and Kevin M. Murphy, 1991, "Rational Addiction and the Effect of Price on Consumption." *American Economic Review* v81, n2 (May): 237-41

Becker, Gary S., Grossman, Michael, and Murphy, Kevin M., 1994, "An Empirical Analysis of Cigarette Addiction." *American Economic Review* v84, n3 (June): 396-418

B. Determinants of Children's health

► Behrman, Jere, F., and Mark R. Rosenzweig, 2004. "Returns to Birthweight." *Review of Economics and Statistics* 86 (2, May), pp. 586-601.

► *Rosenzweig, Mark R., and Schultz, T. Paul, (1982?) "The Behavior of Mothers as Inputs to Child Health: The Determinants of Birth Weight, Gestation, and Rate of Fetal Growth," chapter 2 in *Economic Aspects of Health*, Victor R. Fuchs, ed., (Chicago: University of Chicago Press).

*Wolpin, Kenneth I., 1997, "Determinants and Consequences of the Mortality and Health of infants and Children." *Handbook of Population and Family Economics Vol 1A*. Rosenzweig and Stark, editors. 484-555.

Rosenzweig, Mark R., and Wolpin, Kenneth I., 1991, "Inequality at Birth: The Scope for Policy Intervention," *Journal of Econometrics* 50 (102), 205-228.

Case, Anne, Darren Lubotsky, and Christina Paxson, 2002. "Economic Status and Health in Childhood: The Origins of the Gradient." *American Economic Review* 92 (5), 1308-34.

C. Adult health, work, and earnings

▶ Bartel, Ann, and Paul Taubman, 1979, "Health and Labor Market Success: The Role of Various Diseases." *The Review of Economics and Statistics* 61(1) (February), 1-8.

▶ Stern, Steven, 1989. "Measuring the Effect of Disability on Labor Force Participation." *Journal of Human Resources* 24 (3, Summer), pp. 361-95.

▶ Butler, S., Richard V. Burkhauser, Jean M. Mitchell, Theodore P. Pincus, 1987. "Measurement Error in Self-Reported Health Variables," *The Review of Economics and Statistics*, Vol. 69, No. 4. (Nov.), pp. 644-650.

▶ Kreider, Brent, 1999. "Latent Work Disability and Reporting Bias" *Journal of Human Resources* v34, n4 (Fall 1999): 734-69.

▶ Parsons, Donald, O., 1977. "Health, Family Structure, and Labor Supply," *The American Economic Review* 67(4, September), 703-712.

▶ Ettner, Susan L., 1996. "The Opportunity Costs of Elder Care" *Journal of Human Resources* 31 (1, Winter), 189-205.

Sickles, Robin C., and Paul Taubman, 1998. "Mortality and Morbidity among Adults and the Elderly, " in Volume 1A, *Handbook of Population and Family Economics*.

Wolfe, Douglas A., and Beth J.Soldo, 1994. "Married Women's Allocation of Time to Employment and Care of Elderly Parents." *Journal of Human Resources* 24(4, Fall), pp. 1259-1276.

D. Health and Economic Development

Fogel, Robert W., 1994. "Economic Growth, Population Theory, and Physiology: The Bearing of Long-Term Processes on the Making of Economic Policy," *American Economic Review* 84 (June), 369-395.

Deaton, Angus, 2003. "Health Inequality and Economic Development," *Journal of Economic Literature*. XLI (1, March).

IX. Aging

► Kalemli-Ozcan, Sebnem, Ryder, Harl E., and Weil, David N., 2000, "Mortality Decline, Human Capital Investment, and Economic Growth," *Journal of Development Economics* v62, n1 (June): 1-23.

*Hurd, Michael D., "The Economics of Individual Aging," 1998, in *Handbook of Population and Family Economics*.

*Weil, David N., "The Economics of Population Aging," 1998, in *Handbook of Population and Family Economics*.

Deaton, Angus S. and Christina H. Paxson, 1998. "Aging and Inequality in Income and Health," *American Economic Review* 88 (2, May), 248-53.

X. Human Capital and Aggregate Growth: "Endogenous Growth" Models

► Lucas, Robert E., Jr., 1988, "On the Mechanics of Economic Development," *J. Monetary Econ.* 22, 3-42.

► Becker, Gary S., Murphy, Kevin M., and Tamura, Robert, 1990, "Human Capital, Fertility and Economic Growth." *Journal of Political Economy* 98 (5, part 2), S12-S37.

► Barro, Robert J., and Sala-I-Martin, Xavier, 1992, "Convergence" *Journal of Political Economy* 100 (April) 223-51.