Raising Children to Work Hard: Altruism, Work Norms, And Social Insurance

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I. INTRODUCTION

I.A. Empirical Evidence of Delayed Welfare-State Effects on Work

- The timing of apparent negative effects on work looks different.

- From 1960, both the level and the development of the average hours of work were approximately the same in the United States and the EU up until the mid-1970s.

- After that, the average hours of work remained approximately constant in the United States, but continued to fall at about the same rate as before in the EU (see Figure I).

- Thus, the decline in the EU continued long after the generosity of the welfare state arrangements, and tax rates on labor income, had peaked.

- This is consistent with the hypothesis that the full effect of weakened economic incentives for work in Europe materialized with a considerable time lag.

Average Annual Hours Actually Worked per Person, Part-Time and Full-Time, USA versus EU15 (Available Countries) 1960–2003
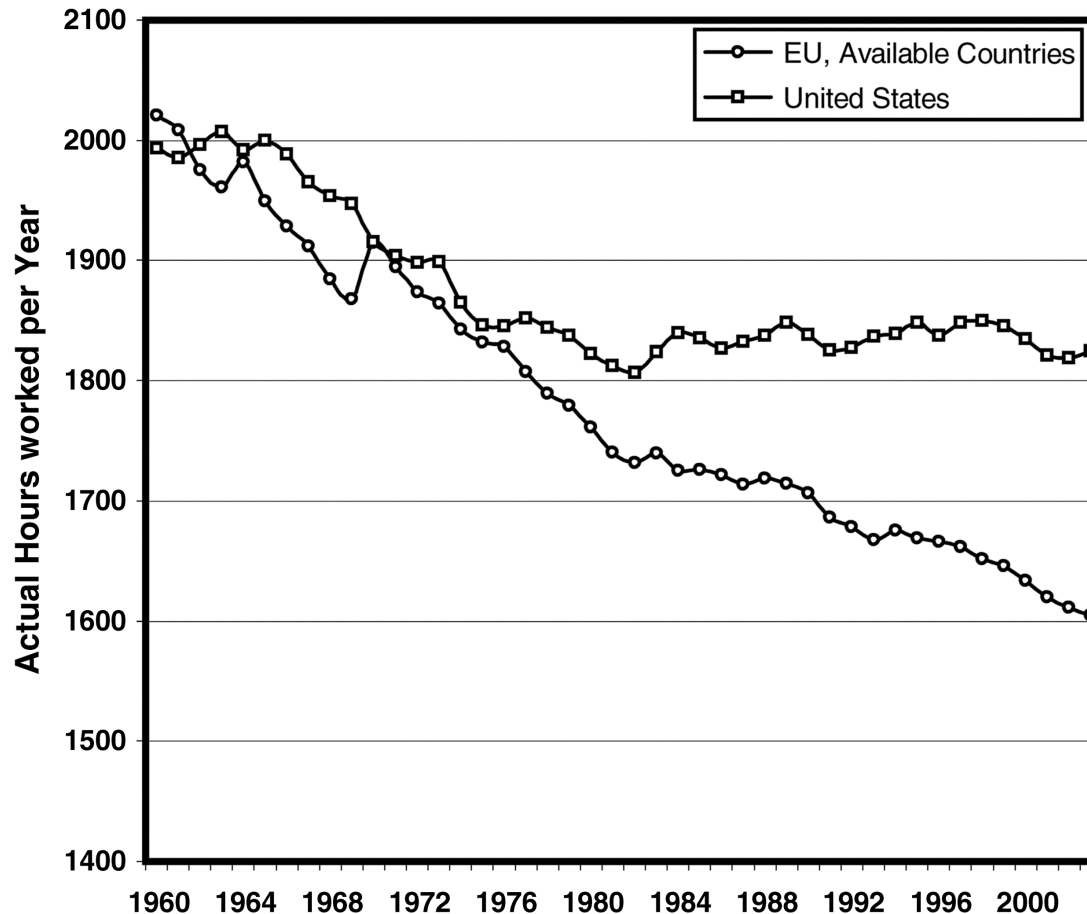
Source: OECD, Employment Outlook, Economic Outlook CD 2003/2.
Note: The uneven time-series before 1970 is a result of missing data for several countries. Every country has the same weight.

II. THE MODEL

- For simplicity, wages are assumed to be fixed—only the probability of receiving a high or a low wage depends on effort.

- The utility of the child is

$$(1) \qquad U_k(c_k, p, s) = \begin{cases} \ln c_k^h - v(p) & \text{with probability } p \\ \ln c_k^l - v(p) - s & \text{with probability } 1 - p, \end{cases}$$

- where the child's consumption c_k can take on two values, c_k^h and c_k^l, depending on how the child fares in the labor market.

- Consumption equals after-tax income and benefits plus any support provided by parents: $c_k^i = (1 - t)w^i + B^i + r^i = y^i + r^i$, where superscript one denotes parental support to the child and y^i denotes the disposable income before parental support.

- We assume that social insurance is less than complete, so that $y^l < y^h$.

- We assume the utility of an altruistic parent to depend on his own consumption and the utility of his child in the following way:

$$(2) \qquad U_p(c_p, c_k, p, s) = \ln c_p + \alpha U_k(c_k, p, s),$$

- where the parent's consumption c_p is his income I minus any support r^i provided to the child; i.e., $c_p^i = I - r^i$.

- Parental altruism is measured by   , i.e., the weight the parent attaches to the child's utility.

- We assume that parents are neither entirely selfish nor fully altruistic; i.e., $\alpha \in (0,1)$.

II.A. Choices of Financial Support and Effort

- Parents decide on financial support after having observed their child's performance in the labor market.

- Parents choose r^i to maximize utility, as expressed in (2), subject to $r^i \geq 0$, and the first-order condition is

$$\frac{dU_p}{dr^i} = -\frac{1}{I - r^i} + \frac{\alpha}{y^i + r^i} \leq 0.$$

- The optimal support, $r^i = \max\{(\alpha I - y^i)/(1 + \alpha), 0\}$, depends on parental altruism, income, and the child's earnings.

- Three cases can occur: parents do not provide financial support $(\alpha I < y^l)$: they only provide support in bad outcomes $(y^l < \alpha I < y^h)$; and they provide support in both outcomes $(\alpha I > y^h)$.

- Using the optimal r^i , the agents' consumption can be expressed as

$$c_k^i = \max\left\{\frac{\alpha}{1 + \alpha}(I + y^i), y^i\right\}$$

(3)

$$c_p^i = \min\left\{\frac{1}{1 + \alpha}(I + y^i), I\right\}.$$

- Given anticipated support and noneconomic incentives, the child chooses p to maximize the expected utility:

(4) $$E[U_k(c_k,s)] = p \ln c_k^h + (1-p)[\ln c_k^l - s] - v(p).$$

- The first-order condition for the child's choice of p is

(5) $$\ln \tilde{c}_k + s - v'(p) \leq 0 \quad \text{or} \quad \ln \tilde{c}_k + s - \frac{q}{1-p} \leq 0.$$

II.B. Norm Formation (Upbringing)

- Parents choose s to maximize the expected utility, taking the child's effort choice, implicitly given by (5), into account.

- The parent's expected utility is

$$(6) \quad E[U_p(c_p, c_k, s)] = p(s) \ln c_p^h + (1 - p(s)) \ln c_p^l + \alpha E[U_k],$$

- where we write $p(s)$ to emphasize the direct link between s and the child's choice of p. The first-order condition for the parent's choice of s is

$$(7) \quad \frac{dE[U_p]}{ds} = \ln \tilde{c}_p \frac{\partial p}{\partial s} + \alpha \left(\frac{\partial E[U_k]}{\partial s} + \frac{\partial E[U_k]}{\partial p} \frac{\partial p}{\partial s} \right) \leq 0,$$

- Where $\partial E[U_k]/\partial p$, since condition (5) is assumed to hold with equality.

- Moreover, it implicitly follows from the same condition $\partial p / \partial s = 1/v''(p) = (1-p)^2/q$, i.e., p increases in s, as would be expected.

- Next, since $\partial E[U_k]/\partial p = -(1-p)$, condition (7) simplifies to

$$(8) \qquad \ln \tilde{c}_p \, \frac{\partial p}{\partial s} - \alpha(1-p) \leq 0 \quad \text{or} \quad \ln \tilde{c}_p - \alpha \frac{q}{1-p} \leq 0.$$
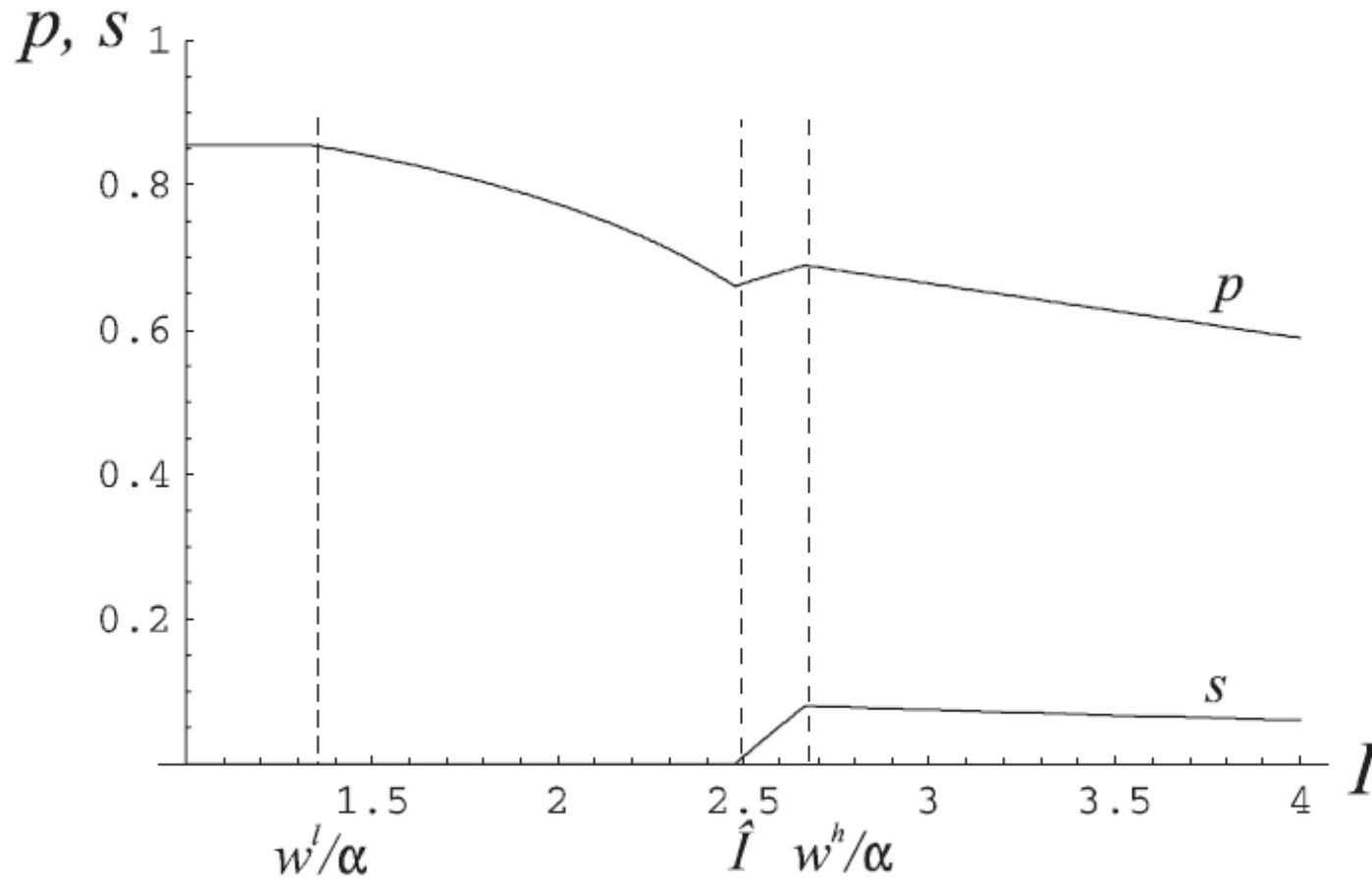
- This reflects a trade-off between the parent's own utility of a higher p, $\ln \tilde{c}_p$, and the utility cost this imposes on the child.

- An explicit expression for the parents' optimal choice of s can be derived by combining (5) and (8)

$$(9) \qquad s = \max \{ \ln \tilde{c}_p / \alpha - \ln \tilde{c}_k, 0 \}.$$

II.C. Comparative Statics

FIGURE II
Norm Formation and Labor Market Prospects as Functions of Parental Income

Note: In the example $w^h = 2, w^l = q, \alpha = 0.75, and\ q = 0.1$.

- Figure II illustrates how the choices of s and p depend on I in a case without social insurance.

- As parents begin extending support in bad outcomes, at $I = 4/3$, p starts to decline. At $\hat{I} = 2.48$, parents begin using noneconomic incentives, resulting in higher p.

- Above $I = 8/3 (= w^h/\alpha)$, parents provide support in both outcomes, and then s and p decline in income.

II.D. Social Insurance

- A policy, {t,B}, balances the social insurance budget in expectation if

$$(10) \qquad t[\pi w^h + (1 - \pi)w^l] = (1 - \pi)B.$$

- The budget-balancing transfer, $B = t[w^l + (\pi/(1 - \pi))w^h]$, strictly increases in π and t.

- Since B is only paid out in bad outcomes, the consumption ratios, $\tilde{c}_p$ and $\tilde{c}_k$, strictly decrease in π, causing individual effort and p to decrease in π.

- Since π is the average success probability in the population, this observation ensures that for any tax rate, there exists a unique fixed point in π and a corresponding budget-balancing benefit.

- If the tax rate t is too high, then effort does not pay and π = 0.

III. SOME EMPIRICAL EVIDENCE

- Hard work is a discrete choice variable and we estimate both a linear probability model and a logit model, Tables I and II, respectively.

- To allow for the predicted effect of household income, a hump-shape that levels off, we estimate a cubic as well as two quadratic specifications, one for low incomes (the first three deciles) and one for high incomes (from the fourth decile and up).

- Apart from income these specifications also contain social expenditure, GINI and GDP growth, which enter linearly—columns (1)–(3) in Tables I and II.

- In columns (4)–(6) we have added control variables, and columns (7)–(9) include region dummies.

TABLE I
OLS REGRESSION FOR THE EMPHASIS ON HARD WORK

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Household income	0.1208 [5.57]	0.1815 [2.38]	0.1163 [−5.20]	0.0772 [2.27]	0.1897 [1.66]	−0.0918 [−2.78]	0.0560 [1.66]	0.1637 [1.46]	−0.0857 [−2.63]
Household income squared	−0.0282 [−6.23]	−0.0388 [−2.09]	0.0074 [4.48]	−0.0185 [−2.64]	−0.0434 [−1.59]	0.0069 [2.81]	−0.0146 [−2.10]	−0.0405 [−1.51]	0.0067 [2.77]
Household income cubic	0.0017 [6.11]			0.0012 [2.85]			0.0010 [2.43]		
Government social spending	−0.0084 [−8.19]	−0.0116 [−6.07]	−0.0069 [−5.70]	−0.0129 [−8.59]	−0.0181 [−6.54]	−0.0108 [−6.02]	−0.0184 [−5.42]	−0.0343 [−5.43]	−0.0114 [−2.83]
GINI	0.0023 [2.42]	−0.0005 [−0.30]	0.0034 [3.01]	−0.0014 [−1.09]	−0.0061 [−2.58]	0.0007 [0.44]	0.0012 [0.51]	−0.0117 [−2.63]	0.0063 [2.21]
Real GDP growth per capita	0.0118 [2.81]	−0.0035 [−0.50]	0.0254 [4.40]	0.0291 [3.52]	0.0332 [2.16]	0.0287 [2.90]	0.0324 [3.63]	0.0333 [1.95]	0.0326 [3.07]
Luck or connections				−0.0109 [−4.34]	−0.0095 [−2.22]	−0.0117 [−3.75]	−0.0127 [−5.12]	−0.0127 [−3.03]	−0.0129 [−4.15]
Left to right				0.0019 [0.57]	−0.0002 [−0.04]	0.0025 [0.61]	0.0079 [2.39]	0.0061 [1.04]	0.0080 [1.97]
Social class				0.0244 [3.10]	0.0109 [0.78]	0.0303 [3.17]	0.0233 [2.98]	0.0085 [0.61]	0.0261 [2.75]
Age				0.0028 [5.97]	0.0032 [4.37]	0.0026 [4.10]	0.0023 [4.99]	0.0025 [3.51]	0.0023 [3.66]
Protestant				−0.1230 [−6.67]	−0.1399 [−4.03]	−0.1183 [−5.42]	−0.0639 [−3.02]	−0.0581 [−1.54]	−0.0704 [−2.75]
Gender male				0.0486 [3.54]	0.0389 [1.58]	0.0504 [3.03]	0.0496 [3.66]	0.0445 [1.85]	0.0516 [3.14]
North Europe							0.0146 [0.47]	0.0105 [0.18]	0.0117 [0.31]
South Europe							0.1480 [5.89]	0.1194 [2.48]	0.1502 [5.06]
Nordic Countries							−0.0211 [−0.44]	−0.0188 [−0.22]	−0.0294 [−0.51]
Asia							−0.1070 [−1.99]	−0.3807 [−3.71]	0.0061 [0.10]
Mexico and Turkey							−0.1713 [−4.37]	0.1662 [−2.39]	−0.1695 [−3.55]
Constant	0.2552 [4.00]	0.4071 [3.31]	0.6492 [6.60]	0.3515 [3.40]	0.5403 [2.88]	0.5905 [3.92]	0.3633 [2.29]	1.1031 [3.56]	0.3463 [1.69]
Observations	9338	3068	6270	4540	1468	3072	4540	1468	3072
Adjusted R^2	0.0536	0.0429	0.0521	0.0831	0.0898	0.0784	0.1111	0.1270	0.1034

Note: z-values are in brackets. North Europe (Austria, Belgium, France, Germany, The Netherlands, and Switzerland); South Europe (Italy, Portugal, and Spain); "Nordic" countries (Denmark, Finland, Iceland, Norway, and Sweden); Asia (Japan and Korea); Turkey and Mexico; and the default region is Australia, Britain, Canada, Ireland, and the United States.

TABLE II
LOGIT REGRESSIONS FOR THE EMPHASIS ON HARD WORK

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Household income	0.6323 [5.79]	0.8622 [2.46]	−0.5916 [−5.03]	0.3745 [2.32]	0.8620 [1.61]	−0.4341 [−2.75]	0.2855 [1.72]	0.7727 [1.40]	−0.4288 [−2.67]
Household income squared	−0.1470 [−6.40]	−0.1831 [−2.16]	0.0374 [4.30]	−0.1957 [−2.69]	−0.0434 [−1.54]	0.0326 [2.78]	−0.0749 [−2.19]	−0.1886 [−1.43]	0.0335 [2.82]
Household income cubic	0.0088 [6.24]			0.0059 [2.89]			0.0053 [2.53]		
Government social spending	−0.0412 [−8.08]	−0.0530 [−6.08]	−0.0347 [−5.50]	−0.0588 [−8.41]	−0.0820 [−6.31]	−0.0498 [−5.94]	−0.0901 [−5.30]	−0.1714 [−5.34]	−0.0546 [−2.69]
GINI	0.0107 [2.31]	−0.0031 [−0.39]	0.0175 [3.02]	−0.0063 [−1.05]	−0.0273 [−2.54]	0.0034 [0.46]	−0.0016 [−0.14]	−0.0667 [−3.03]	0.0255 [1.77]
Real GDP growth per capita	0.0456 [2.24]	−0.0201 [−0.66]	0.1314 [3.92]	0.0291 [3.40]	0.1538 [2.14]	0.1277 [2.74]	0.1455 [3.41]	0.1428 [1.73]	0.1454 [2.87]
Luck or connections				−0.0516 [−4.33]	−0.0435 [−2.20]	−0.0563 [−3.76]	−0.0620 [−5.11]	−0.0620 [−3.05]	−0.0634 [−4.16]
Left to right				0.0086 [0.56]	−0.0004 [−0.02]	0.0110 [0.57]	0.0384 [2.39]	0.0316 [1.13]	0.0384 [1.94]
Social class				0.1118 [3.00]	0.0457 [0.69]	0.1419 [3.11]	0.1101 [2.88]	0.0399 [0.58]	0.1244 [2.67]
Age				0.0136 [6.11]	0.0149 [4.38]	0.0127 [4.25]	0.0118 [5.15]	0.0126 [3.54]	0.0117 [3.81]
Protestant				−0.6580 [−6.92]	−0.7347 [−4.14]	−0.6346 [−5.61]	−0.3167 [−3.14]	−0.0581 [−1.59]	−0.3716 [−2.80]
Gender male				0.2338 [3.59]	0.1808 [1.58]	0.2460 [3.08]	0.2509 [3.79]	0.2246 [1.91]	0.2637 [3.25]
North Europe							−0.0121 [−0.08]	−0.0076 [−0.03]	−0.0251 [−0.13]
South Europe							0.6302 [5.26]	0.4924 [2.16]	0.6629 [4.66]
Nordic Countries							−0.4245 [−1.63]	−0.3226 [−0.70]	−0.4861 [−1.52]
Asia							−0.6412 [−2.40]	−2.004 [−3.97]	−0.0473 [−0.15]
Mexico and Turkey							−0.7555 [−4.14]	−0.7331 [−2.31]	−0.7447 [−3.30]
Constant	−1.1005 [−3.51]	−0.3910 [−0.70]	0.9166 [1.80]	−0.7139 [−1.49]	0.1464 [0.17]	0.4542 [0.64]	−0.2907 [−0.37]	3.4519 [2.26]	−0.4621 [−0.45]
Observations	9338	3068	6270	4540	1468	3072	4540	1468	3072
Pseudo R^2	0.0441	0.0346	0.0439	0.0681	0.0759	0.0655	0.0937	0.1106	0.0890

Note: z-values are in brackets. North Europe (Austria, Belgium, France, Germany, The Netherlands, and Switzerland); South Europe (Italy, Portugal, and Spain); "Nordic" countries (Denmark, Finland, Iceland, Norway, and Sweden); Asia (Japan and Korea); Turkey and Mexico; and the default region is Australia, Britain, Canada, Ireland, and the United States.

IV. CONCLUDING REMARKS