Wage Inequality: Cross-Sectional Evidence
Figure 1: Changes in Real Wage Levels of Full-time U.S. Workers by Sex and Education, 1963–2012, Males

Source: Autor 2014, Skills, Education, and the Rise of Earnings Inequality Among the “Other 99 Percent”
Figure 2: Changes in Real Wage Levels of Full-time U.S. Workers by Sex and Education, 1963–2012, Females

Source: Autor 2014, Skills, Education, and the Rise of Earnings Inequality Among the “Other 99 Percent”
Figure 3: The U.S. College/High School Premium, 1963–2012

Source: Autor 2014, Skills, Education, and the Rise of Earnings Inequality Among the “Other 99 Percent”

Note: College versus high school wage gap. Figure uses March CPS data for earnings years 1963 to 2012. The series labeled Measured Gap is constructed by calculating the mean of the natural logarithm of weekly wages for college graduates and noncollege graduates, and plotting the (exponentiated) ratio of these means for each year. This calculation holds constant the labor market experience and gender composition within each education group. The series labeled Predicted by Supply-Demand Model plots the (exponentiated) predicted values from a regression of the log college/noncollege wage gap on a quadratic polynomial in calendar years and the natural log of college/noncollege relative supply.
Figure 4: Estimated Male College Wage Premium from Different Specifications

Of the total increase in 90–10 residual inequality from 1980 to 2000 (the time period when it increased the most), skills account for 15.3% of this growth for high school and 12.6% for college graduates. In any given year, skills explain a higher fraction of residual wage inequality in the college group because despite the fact that the variance of cognitive skills is lower among college graduates, the non-linearities in returns to high skill levels held by most college graduates imply a larger dispersion in earnings.

Skills have become more important in explaining inequality over time, partly because the variance of cognitive skills within gender–education groups has increased from 1980 to 2010, by 14% for college and 9% for high school male graduates. Also, the increase in returns to cognitive skills disproportionally favoured those supplying higher skill levels within groups. The importance of skills has grown faster for college graduates since their skill dispersion has increased more rapidly and there is a larger fraction of high cognitive skill individuals within the college group whose skill returns have grown more disproportionally.

I also study whether skills can account for the divergent growth patterns observed after 1990 in the 90–50 and 50–10 percentile differentials. Skills account for only small fractions of the 90–50 percentile differential within both education groups (Fig. 8). They explain 22.7% of the increase in 90–50 residual inequality for high school graduates from 1990 to 2000 but none of the much larger increase for college graduates.

Skills without quadratics explain on average 15.9% less of the residual inequality that is explained by including skills and their squared terms among college graduates, but only 1.4% less for high school graduates, showing non-linearities are more important for the college group.

Source: Capatina (2014).
Figure 5: College Share of U.S. Hours Worked Among All Adults (%), 1963–2012

Source: Autor 2014, Skills, Education, and the Rise of Earnings Inequality Among the “Other 99 Percent”
Figure 6: Percent of Adults with Some College Education by Age 35

Figure 7: Effect of Accounting for Skills on Residual Wage Inequality

(A) Residual 90/10 Hourly Wage Inequality

Source: Capatina (2014).
Figure 7: Effect of Accounting for Skills on Residual Wage Inequality (cont.)

(B) Residual 90/10 Hourly Wage Inequality

Men, College

Source: Capatina (2014).
Figure 8: Employment Polarization in the U.S.: Changes in Employment by Major Occupational Category, 1979–2012
Figure 9: Smoothed Changes in U.S. Employment by Occupational Skill Percentile, 1979–2012

Source: Autor, 2015.
Figure 10: Smoothed Changes in U.S. Mean Wages by Occupational Skill Percentile, 1979–2012

Source: Autor, 2015.
Family Income Inequality
Figure 11: Trends in Family Income Inequality in USA

Figure 13.

Cumulative Growth in Average Inflation-Adjusted After-Tax Income, by Before-Tax Income Group, 1979 to 2011

Source: Congressional Budget Office.

Notes: After-tax income is before-tax income minus federal taxes.

Before-tax income is market income plus government transfers. Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), capital income excluding capital gains, income received in retirement for past services, and other sources of income. Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs. Those transfers include payments and benefits from federal, state, and local governments.

Federal taxes include individual income taxes, payroll taxes, corporate income taxes, and excise taxes.

Income is converted to 2011 dollars using the personal consumption expenditures price index.

Income groups are created by ranking households by before-tax income, adjusted for household size. Quintiles (fifths) contain equal numbers of people; percentiles (hundredths) contain equal numbers of people as well.

For more detailed definitions of income, see the appendix.
Figure 12: Income Inequality Has Been Rising Over the Past Three Decades: Trends in Inequality (Gini Coefficient) 1985–2012, Total Population

Note: OECD average: unweighted and based on 12 countries for which data are available at all points (Canada, Denmark, France, Germany, Israel, Italy, Netherlands, New Zealand, Spain, Sweden, United Kingdom and United States). Data for 2011 and 2012 are provisional. Source: OECD Income Distribution Database (2013).
Market incomes are distributed much more unequally than net incomes.

Note: Income refers to household income. Late 2000s refers to a year between 2006 and 2009. The OECD average excludes Greece, Hungary, Ireland, Mexico and Turkey (no information on market income available). Working age is defined as 18-65 years old. Countries are ranked in increasing order of disposable income inequality.

1. Information on data for Israel: http://dx.doi.org/10.1787/888932315602.

Source: Chapter 6, Figure 6.1
Figure 13: Demographic changes were less important than labour market trends in explaining changes in household earnings distribution.

Percentage contributions to changes in household earnings inequality, OECD average, mid-1980s to mid-2000s

Note: Working-age population living in a household with a working-age head. Household earnings are calculated as the sum of earnings from all household members, corrected for differences in household size with an equivalence scale (square root of household size). Percentage contributions of estimated factors were calculated with a decomposition method which relies on the imposition of specific counterfactuals such as: “What would the distribution of earnings have been in recent year if workers’ attributes had remained at their early year level?” The residual indicates the importance of unmeasured factors. These include other changes in household characteristics, such as trends in ageing or migration.

Source: Chapter 5, Figure 5.9.
**Figure 14:** Estimated Average Annual Percentage Change in Various Inequality Measures Accounted for by Factor Components, US 1979–2007

<table>
<thead>
<tr>
<th></th>
<th>Gini</th>
<th>GE(0)</th>
<th>GE(1)</th>
<th>GE(2)</th>
<th>CV</th>
<th>P90/P10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual</td>
<td>0.4</td>
<td>1.05</td>
<td>0.87</td>
<td>1.11</td>
<td>0.56</td>
<td>0.82</td>
</tr>
<tr>
<td>Household Structure</td>
<td>23%</td>
<td>22%</td>
<td>21%</td>
<td>17%</td>
<td>16%</td>
<td>33%</td>
</tr>
<tr>
<td>Men's Employment</td>
<td>5%</td>
<td>5%</td>
<td>3%</td>
<td>4%</td>
<td>4%</td>
<td>5%</td>
</tr>
<tr>
<td>Men's Earning Disparity</td>
<td>73%</td>
<td>30%</td>
<td>78%</td>
<td>100%</td>
<td>100%</td>
<td>50%</td>
</tr>
<tr>
<td>Women's Employment</td>
<td>-25%</td>
<td>-20%</td>
<td>-23%</td>
<td>-24%</td>
<td>-25%</td>
<td>-22%</td>
</tr>
<tr>
<td>Women's Earning Disparity</td>
<td>20%</td>
<td>11%</td>
<td>14%</td>
<td>6%</td>
<td>5%</td>
<td>29%</td>
</tr>
<tr>
<td>Assortative Mating</td>
<td>10%</td>
<td>8%</td>
<td>11%</td>
<td>11%</td>
<td>11%</td>
<td>11%</td>
</tr>
<tr>
<td>Other</td>
<td>-5%</td>
<td>44%</td>
<td>-5%</td>
<td>-14%</td>
<td>-11%</td>
<td>-6%</td>
</tr>
</tbody>
</table>

Evidence on the Top of Income Distribution
Decomposing Top 10% into 3 Groups, 1913-2012

The Top 0.1% Income Share and Composition, 1916-2014

Note: The Figure displays the top 0.1% income share and its composition.

Source: Piketty and Saez, 2003 updated to 2013. Series based on pre-tax cash market income including or excluding realized capital gains, and always excluding government transfers.
The areas highlighted above—transfers, tax-exempt capital income, capital gains, and deductions—may all give rise to cross-country differences and to lack of comparability over time in the income tax data. Any user needs to take them into account. We have tried to flag those items for each study in Table 4. The same applies to tax evasion, to which we devote the next subsection.

3.2.3 Tax Avoidance and Tax Evasion

As highlighted above, the standard objection to the use of income tax data to study the distribution of income is that tax returns are largely works of fiction, as taxpayers seek to avoid and evade being taxed. The underreporting of income can affect cross-country comparisons where there are differences in prevalence of evasion and can affect measurement of trends where the extent of evasion has changed over time.

It is not a coincidence that the development of income taxation follows a very similar path across the countries studied. All countries start with progressive taxes on comprehensive income using high exemption levels that limit the tax to only a small group at the top of the distribution. Indeed, at an early point, tax policy was designed to address the issue of income inequality.
## Real Income Growth by Groups

<table>
<thead>
<tr>
<th></th>
<th>Average Income Real Growth</th>
<th>Top 1% Incomes Real Growth</th>
<th>Bottom 99% Incomes Real Growth</th>
<th>Fraction of total growth (or loss) captured by top 1%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Full period</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1993-2012</td>
<td>17.9%</td>
<td>86.1%</td>
<td>6.6%</td>
<td>68%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Clinton Expansion</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1993-2000</td>
<td>31.5%</td>
<td>98.7%</td>
<td>20.3%</td>
<td>45%</td>
</tr>
<tr>
<td>2001 Recession</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2002</td>
<td>-11.7%</td>
<td>-30.8%</td>
<td>-6.5%</td>
<td>57%</td>
</tr>
<tr>
<td><strong>Bush Expansion</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002-2007</td>
<td>16.1%</td>
<td>61.8%</td>
<td>6.8%</td>
<td>65%</td>
</tr>
<tr>
<td><strong>Great Recession</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007-2009</td>
<td>-17.4%</td>
<td>-36.3%</td>
<td>-11.6%</td>
<td>49%</td>
</tr>
<tr>
<td>Recovery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2009-2012</td>
<td>6.0%</td>
<td>31.4%</td>
<td>0.4%</td>
<td>95%</td>
</tr>
</tbody>
</table>

Computations based on family market income including realized capital gains (before individual taxes).
Incomes exclude government transfers (such as unemployment insurance and social security) and non-taxable fringe benefits.
Incomes are deflated using the Consumer Price Index.
Column (4) reports the fraction of total real family income growth (or loss) captured by the top 1%.
For example, from 2002 to 2007, average real family incomes grew by 16.1% but 65% of that growth accrued to the top 1% while only 35% of that growth accrued to the bottom 99% of US families.
**Figure 16:** Average Pay (Estimated) of S&P 500 CEOs Relative to Average AGI of Top 0.1% of Taxpayers from 1993 to 2013

*Source:* ExecuComp, Piketty and Saez (2013).
The share of the richest 1% in total pre-tax income has increased in most OECD countries in the past three decades, particularly in some English-speaking countries but also in some Nordic (from low levels) and Southern European countries. Today, they range between 7% in Denmark and the Netherlands up to almost 20% in the United States. This increase is the result of the top 1% capturing a disproportionate share of overall income growth over the past three decades: up to 37% in Canada and even 47% in the United States. This explains why the majority of the population cannot reconcile the aggregate income growth figures with the performance of their incomes. At the same time, tax reforms in almost all OECD countries reduced top personal income tax rates as well as rates of other taxes affecting the highest income earners. The crisis did put a temporary halt to these trends—but it did not undo the previous surge in top incomes. In some countries, top incomes had already largely recovered in 2010.

To respond to these trends, governments have several options at hand to increase effective taxation paid by top income recipients without necessarily raising their marginal rates, to improve tax compliance and to reduce tax avoidance.

Inequality and policies to restore equal opportunities have moved to the forefront of the political debate in many countries. Topping the bestseller lists is Thomas Piketty’s 700-page study of how the very richest in society are accumulating an ever-increasing proportion of national incomes (Capital in the Twenty-first Century). After the OECD’s flagship publications Growing Unequal in 2008 and Divided we Stand in 2011, new analysis by the OECD uses data developed by Piketty and collaborators on top incomes to look at trends across countries, and identify concrete policy options to ensure a fairer distribution of resources and promote more inclusive growth.

**Figure 17: Top Incomes Surged**

Shares of top 1% incomes in total pre-tax income, 1981-2012 (or closest)

Note: Incomes refer to pre-tax incomes, excluding capital gains, except Germany (which includes capital gains). Latest year refers to 2012 for the Netherlands, Sweden and the United States; 2011 for Norway and the United Kingdom; 2009 for Finland, France, Italy and Switzerland; 2007 for Germany; 2005 for Portugal; and 2010 for the remaining countries. Source: OECD calculations based on the World Top Income Database.
Figure 18: Real incomes at the top fell during the crisis but recovered quickly

Percentage changes in real incomes across income groups, average of nine OECD countries, 2008 to 2010

Note: Incomes refer to pre-tax incomes, excluding capital gains. Nine OECD countries for which data are available for these years are Australia, Canada, Denmark, Japan, New Zealand, Norway, Spain, Sweden and the United States. Source: OECD 2014, World Top Incomes Dataset.
Figure 19: In some countries, one fifth or more of total income growth was captured by the top 1%
Figure 20: The share of capital income increases moving up to the very top of the income ladder

Note: Incomes refer to pre-tax incomes, excluding capital gains. Data refer to 2007 (Italy 2005), latest date available. 
Consumption Inequality
Figure 21: Real Changes in Income at Various Percentiles, 2000-2011

Notes: Income is after-tax money income plus food stamps and housing and school lunch subsidies. Figures are adjusted for inflation using the adjusted CPI-U-RS. Source: Meyer and Sullivan (2013).
**Figure 22:** Real Changes in Consumption at Various Percentiles, 2000-2011

*Notes:* Consumption is adjusted for underreporting by calculating a predicted value of consumption from a regression of unadjusted consumption on core consumption and demographic characteristics using data from 1980 and 1981. See text for more details. Figures are adjusted for inflation using the adjusted CPI-U-RS. *Source:* Meyer and Sullivan (2013).
III. Inequality and the Great Recession

For our analyses of inequality between 2000 and 2011, we focus on the 90/10 ratio rather than the variance of the logarithm or the Gini coefficient because the ratios are not sensitive to the extreme tails of the distribution that we expect may be poorly measured in survey data, in particular the lower tail for income and the upper tail for consumption.

Figure 1 displays the ratio of the ninetieth percentile to the tenth percentile for our measures of income and consumption since 2000. Income inequality rose throughout this period, with a particularly large share of the increase in 2003. Between 2008 and 2011 income inequality again rose sharply. For the entire period from 2000 to 2011 the ratio grew by 19 percent. The pattern for consumption inequality is quite different. Consumption inequality rose slowly through 2005. If we did not account for the underreporting of consumption the rise would be barely noticeable. After 2005 consumption inequality fell, dipping below its 2000 level by 2009 and remaining at a lower level. During the years of the Great Recession, consumption and income inequality moved in opposite directions. In fact, the differences between income and consumption inequality since 2007 are among the most striking differences between income and consumption patterns in recent decades.

To examine more fully the changes in the distribution of income and consumption, we plot various percentiles of income and consumption for our sample period. Figure 2 shows the changes in the fifth, tenth, twenty-fifth, fiftieth, seventy-fifth, and ninetieth percentiles of income after 2000. There was a pronounced spreading of the distribution. The seventy-fifth and ninetieth percentiles increased the most: both rose by 10 percent in real terms during this period. The increases at the median and twenty-fifth percentile were more modest. The tenth percentile in 2011 was only slightly higher than in 2000, and the fifth percentile fell nearly 15 percent during this period.

The percentiles of consumption followed a very different pattern, as shown in Figure 3. Consumption rose at all percentiles through 2006 but rose more at each successively higher percentile. The rise at the ninetieth percentile was about 7 percentage points higher than at the fifth percentile. In the following years, the pattern was sharply different. Consumption fell

Notes: Income is after-tax money income plus food stamps and housing and school lunch subsidies. Consumption is adjusted for underreporting by calculating a predicted value of consumption from a regression of unadjusted consumption on core consumption and demographic characteristics using data from 1980 and 1981. See text for more details.

Has the increase in income inequality been matched by an equally large increase in consumption inequality?

Alternative evidence

Source: Krueger and Perri (2006). Notes: LEA is after-tax labour earnings plus transfers, i.e. the sum of wages and salaries of all household members, plus a fixed fraction of self-employment farm and nonfarm income, minus reported federal, state, and local taxes (net of refunds) and SS contributions, plus government transfers (unemployment insurance, food stamps, and welfare). Household’s consumption ND+ is the sum of expenditures on nondurables, services, and small durables (such as household equipment), plus imputed services from housing and vehicles. Each expenditure component is deflated by expenditure-specific, quarter-specific consumer price indexes (CPIs).
Has the increase in income inequality been matched by an equally large increase in consumption inequality?

Source: Krueger and Perri (2006). Notes: LEA is after-tax labour earnings plus transfers, i.e. the sum of wages and salaries of all household members, plus a fixed fraction of self-employment farm and nonfarm income, minus reported federal, state, and local taxes (net of refunds) and SS contributions, plus government transfers (unemployment insurance, food stamps, and welfare). Household’s consumption ND+ is the sum of expenditures on nondurables, services, and small durables (such as household equipment), plus imputed services from housing and vehicles. Each expenditure component is deflated by expenditure-specific, quarter-specific consumer price indexes (CPIs).
Poverty
In 2014, the official poverty rate was 14.8 percent. There were 46.7 million people in poverty. Neither the poverty rate nor the number of people in poverty were statistically different from the 2013 estimates (Figure 4 and Table 3).

For the fourth consecutive year, the number of people in poverty at the national level was not statistically different from the previous year’s estimates (Figure 4 and Table 3). The 2014 poverty rate was 2.3 percentage points higher than in 2007, the year before the most recent recession (Figure 4).

The 2014 poverty rates for most demographic groups examined were not statistically different from the 2013 rates. Poverty rates went up between 2013 and 2014 for only two groups: people with a bachelor’s degree or more and married-couple families (Table 3 and Table 4).

For most groups, the number of people in poverty did not show a statistically significant change. The number of people in poverty increased for unrelated individuals, people aged 18 to 64 with a disability, people with at least a bachelor’s degree, and married-couple families (Table 3 and Table 4).

The poverty rate in 2014 for children under age 18 was 21.1 percent. The poverty rate for people aged 18 to 64 was 13.5 percent, while the rate for people aged 65 and older was 10.0 percent. None of these poverty rates were statistically different from the 2013 estimates (Table 3 and Figure 5).

Race and Hispanic Origin

The poverty rate for non-Hispanic Whites was 10.1 percent in 2014, lower than the poverty rates for other racial and ethnic groups. Since unrelated individuals under age 15 are excluded from the poverty universe, there are 364,000 fewer children in the poverty universe than in the total civilian noninstitutionalized population.
Poverty Rate by Age: 1959 to 2014

- Non-Hispanic Whites: 61.8% of total population, 42.1% of people in poverty.
- Neither poverty rate nor number of people in poverty experienced a statistically significant change between 2013 and 2014.
- Blacks: 26.2% poverty rate, 10.8 million people in poverty.
- Asians: 12.0% poverty rate, 2.1 million people in poverty.
- Hispanics: 23.6% poverty rate, 13.1 million people in poverty.
- None of these estimates were statistically different from the 2013 estimates.

Age
- In 2014, 13.5% of people aged 18 to 64 (26.5 million) were in poverty compared with 10.0% of people aged 65 and older (4.6 million) and 21.1% of children under age 18 (15.5 million).
- Children represented 23.3% of the total population and 33.3% of the people in poverty.
- None of these age groups experienced a statistically significant change in the number or rate of people in poverty between 2013 and 2014 (Table 3 and Figure 5).

Related children are people under age 18 related to the householder by birth, marriage, or adoption who are not themselves householders or spouses of householders.
- The poverty rate and the number in poverty for related children under age 18 were 20.7% and 15.0 million in 2014, not statistically different from the 2013 estimates.
- For related children in families with a female householder, 46.5% were in poverty, compared with 10.6% of related children in married-couple families.

Note: The 2013 data reflect the implementation of the redesigned income questions. See Appendix D for more information. The data points are placed at the midpoints of the respective years. For information on recessions, see Appendix A. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see ftp://ftp2.census.gov/programs-surveys/cps/techdocs/cpsmar15.pdf.

Figure 26: Official and Alternative Income Poverty Rates and
Consumption Poverty Rate, 1960–2010\textsuperscript{a}

Sources: CPS ASEC/ADF; Consumer Expenditure (CE) Survey; authors’ calculations.

\textsuperscript{a} Poverty status is defined as in figure 1, note a.

\textsuperscript{b} Defined as in figure 1, note b.

\textsuperscript{c} Defined as in figure 1, notes c and d.

\textsuperscript{d} Calculated using data from the CE; see the online appendix for further details. Dotted lines indicate periods for which CE data are unavailable.
Figure 27: Childhood Poverty Rates by Race, 1979–2010

Source: United States, Department of Commerce, Census Bureau, 2010.
Figure 28: Family Poverty Rates by Household Type, 1979-2010: Households with Children Under Age 18

Source: United States, Department of Commerce, Census Bureau, 2010.
Figure 29: Poverty Rates by Household Type, 2010

Note: Data refer to 2009 for Hungary, Ireland, Japan, New Zealand, Switzerland and Turkey; 2011 for Chile. Poverty thresholds are set at 50% of the median income of the entire population.
Source: Secrariet calculation of data from the OECD Income distribution database (version Jan 2014).
Child Quality and Inequality
Note: Parents are defined as the head of the household. Children are defined as individuals under 18, living in the household, and the child of the head of household. Children who have been married or are not living with their parents are excluded from the calculation. Separated parents are included in “Married, Spouse Absent” Category.

Figure 31: Fraction of Children Younger than 18 in Different Living Arrangements, All Children, White, Black, and Hispanic

Figure 32: The decoupling of marriage and childbearing

% of births to unmarried women

Note: Whites and blacks include only single-race non-Hispanics. Hispanics are of any race. 2014 data are preliminary. Data for Asians only not available.

Source: National Center for Health Statistics natality data.
Figure 33: For the less educated, more births outside of marriage

% of new mothers who are unmarried

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than High school</td>
<td>59</td>
</tr>
<tr>
<td>High school</td>
<td>54</td>
</tr>
<tr>
<td>Some college</td>
<td>43</td>
</tr>
<tr>
<td>College grad+</td>
<td>11</td>
</tr>
</tbody>
</table>

Note: Based on women ages 15–44 who have given birth in the past year. Marital status is based on time of survey.
Source: Pew Research Center analysis of 2014 American Community Survey (IPUMS).
Figure 34: Per Capita Enrichment Expenditures on Children ($2008) Top Versus Bottom Quartile of Households

Source: Duncan and Murnane (2011).
Children enter school with “meaningful differences” in vocabulary knowledge.

1. **Emergence of the Problem**

In a typical hour, the average child hears:

<table>
<thead>
<tr>
<th>Family Status</th>
<th>Actual Differences in Quantity of Words Heard</th>
<th>Actual Differences in Quality of Words Heard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welfare</td>
<td>616 words</td>
<td>5 affirmatives, 11 prohibitions</td>
</tr>
<tr>
<td>Working Class</td>
<td>1,251 words</td>
<td>12 affirmatives, 7 prohibitions</td>
</tr>
<tr>
<td>Professional</td>
<td>2,153 words</td>
<td>32 affirmatives, 5 prohibitions</td>
</tr>
</tbody>
</table>

2. **Cumulative Vocabulary at Age 3**

<table>
<thead>
<tr>
<th>Cumulative Vocabulary at Age 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children from welfare families:</td>
</tr>
<tr>
<td>Children from working class families:</td>
</tr>
<tr>
<td>Children from professional families:</td>
</tr>
</tbody>
</table>
Figure 35: Disparities in Weekly Time Spent in Literacy Activities by Age and Household Income Quintile

Source: Meredith Phillips, based on Panel Study of Income Dynamics, 2009. Bars show difference relative to children whose family is in the top quintile, adjusted for child's age in month and gender. *Denotes statistically significant difference at the $p < 0.05$ level.
Trend in mean by age for cognitive score by maternal education

Each score standardized within observed sample. Using all observations and assuming data missing at random. Source: Brooks-Gunn et al. (2006).
Figure 36: Average percentile rank on anti-social behavior score, by income quartile

- Lowest Income Quartile
- Second Income Quartile
- Third Income Quartile
- Highest Income Quartile
Figure 37: Fraction of Twelfth-Graders Expecting to Obtain a B.A. by Sex and Parents’ Education, 1979–2007

Source: Brian L. Jacob and Tamara Linkow Wilder, Using data from the Monitoring the Future survey.

Source: Jacob, Linkow and Wilder, 2011.

Some Facts

Source: Duncan and Murnane (2011).
Figure 38: College attendance by AFQT Capability and Family Income Quartiles (1997)

Source: Belley and Lochner (2007).
Figure 39: Fraction of Students Entering College, by Income Quartile and Birth Year

Figure 40: Fraction of Students Completing College, by Income Quartile and Year of Birth


Figure 41: Cognitive skills at age 15-16 and parental income / wealth

(a) CNLSY  
(b) Denmark

Source: James J. Heckman and Rasmus Landersø (2014).
Figure 42: College attendance and parental income / wealth

(a) CNLSY  
(b) Denmark

Source: James Heckman and Rasmus Landersø (2014).
Figure 43: High school completion by parental income and wealth — $\theta^C$, $\theta^N,C$

(a) CNLSY  (b) Denmark

Source: James Heckman and Rasmus Landersø (2014).
Figure 44: College attendance by parental income and wealth — $\theta^C$, $\theta^{N,C}$

(a) CNLSY  

(b) Denmark

Source: James Heckman and Rasmus Landersø (2014).
Figure 45: Income Quintile of Children When They Grow Up Relative to Their Parents’ Income Quintile

Intergenerational Transmission of Family Influence
Intergenerational Mobility and Inequality: The “Gatsby Curve”

\[ \text{IGE: } \ln Y_1 = \alpha + \beta \ln Y_0 + \varepsilon \]

- Income in current generation
- Income of parents

Source: Bradley J. Setzler (2014)

Note:
- Inequality is measured after taxes and transfers.
- Gini index defined on household income.
- IGE measured by pre-tax and transfer income of individual fathers and sons.
<table>
<thead>
<tr>
<th>Source</th>
<th>Data</th>
<th>IGE</th>
<th>Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solon (1992)</td>
<td>PSID</td>
<td>0.29-0.41</td>
<td>1Yr</td>
</tr>
<tr>
<td>Solon (1992)</td>
<td>PSID</td>
<td>0.41</td>
<td>5Yra</td>
</tr>
<tr>
<td>Solon (1992)</td>
<td>PSID</td>
<td>0.53</td>
<td>IVb</td>
</tr>
<tr>
<td>Mazumder (2005)</td>
<td>SIPP</td>
<td>0.53</td>
<td>6Yrc</td>
</tr>
<tr>
<td>Mazumder (2005)</td>
<td>SIPP</td>
<td>0.61</td>
<td>15Yrc</td>
</tr>
<tr>
<td>Mazumder (2005)</td>
<td>NLSY</td>
<td>0.44</td>
<td>3Yrd</td>
</tr>
<tr>
<td>Chetty, et al (2014)</td>
<td>IRS</td>
<td>0.34</td>
<td>5/2Yre</td>
</tr>
</tbody>
</table>

\(^a\) Average of log-earnings of parent only.
\(^b\) Father’s years of education as instrument.
\(^c\) Log of average earnings of child and parent.
\(^d\) Log of average earnings of parent only.
\(^e\) Log of 5 (2) year avg. of parent (child) earnings.
Source: Chetty et al. (2014).
Source: Chetty et al. (2014).
Figure 46: Relative Mobility: Rank–Rank Slopes \( (\overline{y}_{100} - \overline{y}_0)/100 \) by CZ
Figure 47: Other Correlates of Rank–Rank IGE
Inequality in Education
Figure 48: Percentage of high school completers who were enrolled in 2- or 4-year colleges by the October immediately following high school completion, by family income: 1990–2013

NOTE: Due to some short-term data fluctuations associated with small sample sizes, percentages for income groups were calculated based on 3-year moving averages, except in 2013, when estimates were calculated based on 2-year moving averages. High school completers include GED recipients. Low income refers to the bottom 20 percent of all family incomes, high income refers to the top 20 percent of all family incomes, and middle income refers to the 60 percent in between.
Figure 49: Percentage of high school completers who were enrolled in 2- or 4-year colleges by the October immediately following high school completion, by race/ethnicity: 1990–2013

NOTE: Due to some short-term data fluctuations associated with small sample sizes, percentages for racial/ethnic groups were calculated based on 3-year moving averages, except in 2013, when estimates were calculated based on 2-year moving averages. For Asian data, the moving average for 2003 reflects an average of 2003 and 2004. High school completers include GED recipients. Separate data on Asian high school completers have been collected since 2003. From 2003 onward, White, Black, and Asian data exclude persons identifying themselves as Two or more races. Prior to 2003, each respondent could select only a single race category, and the “Two or more races” category was not reported. Race categories exclude persons of Hispanic ethnicity.

Disparities by Education (Post-compulsory Education)

- Education, Wages, Employment, and Health

Wealth Inequality
Top 10%, 1% and 0.1% Wealth Share in the United States, 1913-2012

Composition of the top 0.01% wealth share, 1913-2012

This figure depicts the composition of the wealth held by the top 0.1% richest families, as estimated by capitalizing income tax returns. Source: Appendix Table B5.
Inequality in Health
Figure 50: Differences in the percent of U.S. infants with birth weight <2500g, by maternal characteristics, 2011

Notes: Data was calculated by using singleton births to mothers age 19 to 39 years from the U.S. National Individual-Level Natality Data (birth records). The following states are excluded because education is inconsistently coded over time: Alabama, Alaska, Arizona, Arkansas, Connecticut, Hawaii, Maine, Massachusetts, Minnesota, Mississippi, New Jersey, Rhode Island, Virginia, and West Virginia. We focus on singleton births because multiple births are much more likely to be low birth weight, and many multiple births result from assisted reproductive technology. Sample sizes are printed over each bar. Given the large sample sizes, SEMs are very small (<0.15 percentage points). Source: Aizer and Currie (2014)
Figure 51: Trends in percent low birth weight by maternal SES

Notes: The sample is defined as in Figure 50. Disadvantaged is defined as African American, less than a high school education, and unmarried. Advantaged is defined as white, college education, and married. Source: Aizer and Currie (2014)
**Figure 52: Differences in maternal health and behavior by maternal SES, U.S. 2011**

Notes: The sample is defined as in Figure 50. Disadvantaged is defined as African American, less than a high school education, and unmarried. Advantaged is defined as white, college education, and married. Given the large sample sizes, SEMs are very small (<0.2 units). Source: Aizer and Currie (2014)
Fig 1 Mortality in working age men by proportion of income belonging to the less well off half of households, US states (1990) and Canadian provinces (1991). Mortality standardised to Canadian population in 1991. State abbreviations: LA-Louisiana; MS-Mississippi; AL-Alabama; SC-South Carolina; FL-Florida; TX-Texas; CA-California; AR-Arkansas; NH-New Hampshire; MN-Minnesota. Province abbreviations: QC-Quebec; NS-Nova Scotia; NB-New Brunswick; ND-Newfoundland; PE-Prince Edward Island; ON-Ontario; AB-Alberta; BC-British Columbia; MB-Manitoba; SK-Saskatchewan

Source: Ross et al. (2000).
Table 1.1: Correlations of measures of child wellbeing with income inequality, and average income across the 50 US states (including District of Columbia)

<table>
<thead>
<tr>
<th>Measure of child wellbeing</th>
<th>Income inequality</th>
<th></th>
<th>Average income</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$r$</td>
<td>$P$ value</td>
<td>$r$</td>
<td>$P$ value</td>
</tr>
<tr>
<td>Teenage births$^{12}$</td>
<td>0.72</td>
<td>&lt;0.001</td>
<td>-0.55</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Juvenile homicides$^{12}$</td>
<td>0.31</td>
<td>0.03</td>
<td>0.00</td>
<td>0.99</td>
</tr>
<tr>
<td>Infant mortality$^*$</td>
<td>0.55</td>
<td>&lt;0.001</td>
<td>-0.20</td>
<td>0.15</td>
</tr>
<tr>
<td>Low birth weight$^*$</td>
<td>0.65</td>
<td>&lt;0.001</td>
<td>-0.01</td>
<td>0.99</td>
</tr>
<tr>
<td>Educational performance (combined maths and reading scores for 15 year olds)$^\dagger$</td>
<td>-0.69</td>
<td>&lt;0.001</td>
<td>0.08</td>
<td>0.58</td>
</tr>
<tr>
<td>Dropping out of high school$^\dagger$</td>
<td>0.66</td>
<td>&lt;0.001</td>
<td>-0.28</td>
<td>0.04</td>
</tr>
<tr>
<td>Overweight</td>
<td>0.64</td>
<td>&lt;0.001</td>
<td>-0.07</td>
<td>0.63</td>
</tr>
<tr>
<td>Mental health problems</td>
<td>0.37</td>
<td>0.01</td>
<td>-0.14</td>
<td>0.33</td>
</tr>
</tbody>
</table>

*Similar findings have been reported elsewhere.$^{11}$
†Similar findings have been reported elsewhere.$^{40}$

But first, here, we focus on Wilkinson and Pickett’s (2009a) book *The Spirit Level*. They brought together a range of research in the field over the past 30 or so years to argue that there is a relationship between income inequality and social problems among countries over a certain income threshold (see below). The argument was, therefore, that even among relatively wealthy societies (i.e. those above this threshold), those with greater levels of income inequality fare worse on a range of social indicators. As well as looking at the impact on different health and social problems individually, Wilkinson and Pickett also formed an index of health and social problems, with each item carrying the same weight. This index showed no correlation with average income in wealthy countries, but a strong correlation with income inequality (see Figure 3). The same was also true of US states. They also carried out similar analysis, with similar findings, for UNICEF’s index of child well-being.

*The Spirit Level* was an attempt to provide an accessible summary of the link between income inequality and health and social problems, and so it did not report technical details in the same way as a more academic publication. A paper published by Wilkinson and Pickett in the same year (2009b), however, gave the correlation coefficients between income inequality and different components of the index (see Table 1). Correlation coefficients range from −1 to 1. A value of 1 implies that there is a direct linear relationship between two variables, with all data points lying on a line for which the value of one variable increases directly as the other variable increases. A value of −1 implies that all data points lie on a line for which the value of one variable decreases directly as the other increases. A value of 0 implies that there is no linear correlation between the variables. Levels of correlation above 0.5 suggest a strong relationship in social science analysis. The correlation coefficients shown in Table 1 therefore show very high levels of correlation between income inequality and social mobility, teenage births, imprisonment, trust, mental illness and obesity. Other health and social problems fall below the 0.5 threshold, but only just. These are: homicides, educational performance, life expectancy and infant mortality.

Figure 3: Correlation between inequality and an index of health and social problems

**Index of health and social problems**
- Life expectancy
- Maths & Literacy
- Infant mortality
- Homicides
- Imprisonment
- Teenage births
- Trust
- Obesity
- Mental illness – incl. drugs & alcohol addiction
- Social mobility

**Notes:** Income inequality is measured by the ratio of incomes among the richest compared with the poorest 20% in each country.
Figure 54: The effect of county-level median household income in relation to contextual effect of state-level income inequality

People with more education are likely to live longer and experience better health outcomes.

Figure 2. Less education is linked with worse health.† Across racial or ethnic groups, adults with greater educational attainment are less likely to rate their health as less than very good.

† Based on self-report and measured as poor, fair, good, very good or excellent.
* Age-adjusted.

Appendix
This figure depicts the share of total household wealth held by the richest families, as estimated by capitalizing income tax returns. All of the upswing in the top 1% wealth share since 1960 is due to the rise of the top 0.1%. Source: Appendix Table B1.
The composition of household wealth in the U.S., 1913-2013

This figure depicts the evolution of the ratio of total household wealth to national income. This ratio has followed a U-shaped pattern over the years.

Some Facts
Some Facts

This figure depicts the share and composition of the wealth held by families in the bottom 90% of the wealth distribution, as estimated by capitalizing income tax returns. Source: Appendix Table B5.
The average private (household + corporate) saving rate has been 11.4% over 1913-2013, but the rich save more as a fraction of their income, except in the 1930s when there was large dis-saving through corporations. Source: Appendix Table B33.
Figure 55: College/High School Median Annual Earnings Gap, 1979–2012 (in constant 2012 dollars)

Source: Autor 2014, Skills, Education, and the Rise of Earnings Inequality Among the “Other 99 Percent”
Note: Figure is constructed using Census Bureau P-60 (19791991) and P-25 (19922012) tabulations of median earnings of full-time, full-year workers by educational level and converted to constant 2012 dollars (to account for inflation) using the CPI-U-RS price series. Prior to 1992, college-educated workers are defined as those with 16 or more years of completed schooling, and high schooleducated workers are those with exactly 12 years of completed schooling. After 1991, college-educated workers are those who report completing at least 4 years of college, and high schooleducated workers are those who report having completed a high school diploma or GED credential.
Educational Attainment Decompositions, Males and Females 1900-1980 Birth Cohorts

Notes: 3-year moving averages based on CPS October, Census, CPS March and NCES data. HS graduates are those who obtained a regular public or private HS diploma (excluding GEDs) from the NCES. "Graduate HS" is the fraction of 8th grade enrollments for a given cohort who report a regular HS diploma. "Attend Given HS" is the fraction of recent HS graduates who report being enrolled the fall of the year following graduation. "Attend College" is college enrollments of recent HS graduates as a fraction of 18 year old cohort size. College graduates are those who report a BA or higher by age 25. "Graduate Given Attend" are those who obtained a four year degree as a fraction of the college enrollment total for that cohort. Two-year degrees are not included. "Graduate College" is the number of college graduates as a fraction of the 18 year old cohort size. Population estimates are from the Census P-20 reports. HS diplomas issued by sex are estimated from CPS October data after 1982.

Some Facts
Figure 56: U.S. High School Graduation Rate for 20-24 Year-Olds by Race/Ethnicity and Birth Cohort

Author’s Sources: For birth cohorts 1947-50 to 1956-60, Heckman and LaFontaine (2010); for subsequent cohorts, author’s estimation from U.S. Census, American Community Survey, and GED Testing Service data.
Income inequality increased in most, but not all OECD countries

Gini coefficients of income inequality, mid-1980s and late 2000s

Note: Income refers to disposable household income. For data years see Table 1. Little change in inequality refers to changes of less than 2 percentage points.

1. Information on data for Israel: http://dx.doi.org/10.1787/888932315602.

Source: OECD Database on Household Income Distribution and Poverty.
**Figure 15.**

Reduction in Income Inequality From Government Transfers and Federal Taxes, 1979 to 2011

Percentage Reduction in Gini Index

Source: Congressional Budget Office.

Notes: The Gini index is a measure of income inequality that ranges from zero (the most equal distribution) to one (the least equal distribution). Gini indexes are calculated using income measures adjusted for household size.

Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs. Those transfers include payments and benefits from federal, state, and local governments.

Federal taxes include individual income taxes, payroll taxes, corporate income taxes, and excise taxes.
While market income inequality rose, redistribution through tax/transfers became less effective in many countries.

Changes in cash redistribution of social transfers, personal income taxes and social security contributions, mid-1980s to mid-2000s

**Note:** Income refers to individual income. Redistribution is the difference between the Gini coefficients before and after the respective tax or benefit. Households headed by a working-age individual.

1. Information on data for Israel: http://dx.doi.org/10.1787/888932315602.

**Source:** Chapter 7, Figure 7.3.
Figure 2.

Average Federal Tax Rates, by Before-Tax Income Group, 1979 to 2011 and Projected Under 2013 Law

Source: Congressional Budget Office.

Notes: Average federal tax rates are calculated by dividing federal taxes by before-tax income.

Before-tax income is market income plus government transfers. Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), capital income excluding capital gains, income received in retirement for past services, and other sources of income. Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs. Those transfers include payments and benefits from federal, state, and local governments.

Federal taxes include individual income taxes, payroll taxes, corporate income taxes, and excise taxes.

Federal tax rates for 2013 are calculated by applying individual income tax and payroll tax rules in place in 2013 to the income distribution observed in 2011.

Income groups are created by ranking households by before-tax income, adjusted for household size. Quintiles (fifths) contain equal numbers of people; percentiles (hundredths) contain equal numbers of people as well.

For more detailed definitions of income, see the appendix.
College Quality Rank vs. Parent Income Rank by Cohort

Source: Chetty et al. (2014).
Probability of Reaching Top Quintile by Birth Cohort

Source: Chetty et al. (2014).
Intergenerational Mobility Estimates by Parent’s Census Division

Source: Chetty et al. (2014).
Mean Log Child Income vs. Log Parent Income (Excluding 0’s)

Source: Chetty et al. (2014).

\[ \text{IGE} = 0.344 \pm 0.0004 \]
\[ \text{IGE} \text{ [Par Inc P10-P90]} = 0.452 \pm 0.0007 \]
Mean Child Percentile Rank vs. Parent Percentile Rank

Source: Chetty et al. (2014).
Lifecycle Bias: Intergenerational Income Correlation by Age at Which Child’s Income is Measured

Source: Chetty et al. (2014).
Intergenerational Mobility in the United States vs. Denmark

Mean Child Income Rank vs. Parent Income Rank

- Rank-Rank Slope (Denmark) = 0.180
- Rank-Rank Slope (U.S) = 0.341

Source: Chetty et al. (2014).
Intergenerational Mobility in Salt Lake City vs. Charlotte

Salt Lake City $Y_{25} = 46.2 = $31,100
Charlotte $Y_{25} = 35.8 = $22,900

Source: Chetty et al. (2014).
College Attendance Rates vs. Parent Income Rank in the U.S.

Source: Chetty et al. (2014).
Teenage Birth Rates for Females vs. Parent Income Rank in the U.S.

Source: Chetty et al. (2014).
Absolute Upward Mobility vs. Racial Segregation

![Graph showing the correlation between Absolute Upward Mobility and Theil Index of Racial Segregation in 2000. The correlation coefficient is -0.361 (0.068).]

Source: Chetty et al. (2014).
Absolute Upward Mobility vs. Income Segregation

Source: Chetty et al. (2014).
Upward Mobility vs. Inequality in CZ
The “Great Gatsby” Curve Within the U.S.


Upward Mobility \( (\bar{y}_{25}) \)

Correlation = \(-0.578\)
(0.093)

Source: Chetty et al. (2014).
Upward Mobility vs. Top 1% Income Share in CZ

Correlation = -0.190 (0.072)

Source: Chetty et al. (2014).
Upward Mobility vs. Bottom 99% Gini Coefficient

Correlation = -0.647 (0.092)

Source: Chetty et al. (2014).
Upward Mobility and Fraction of Single Mothers in CZ

Correlation = -0.764 (0.074)

Source: Chetty et al. (2014).