Race and Economic Well-Being in the United States

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Race and economic well-being

Large and persistent racial differences in economic outcomes in the U.S.

- Earnings: Chetty, Hendren, Jones and Porter (2020), Karger (2020)
- Mortality: Case and Deaton (2015) and Chetty et al. (2016)

Studied separately, but likely correlated

- How large is the racial gap in overall living standards?
- Has it changed over time?
- What are the sources of the racial welfare gap?
Methodology

Build on the expected utility framework of Jones and Klenow (2016)

Construct a consumption-equivalent welfare statistic

- Life expectancy
- Consumption
- Consumption inequality
- Leisure
- Leisure inequality
Black welfare started at 45% of White welfare in 1984, rose to 64% by 2019
  - Progress from rising relative consumption and life expectancy

Black welfare was only 28% of White welfare in 1940 (more limited data)
  - Black welfare increased by a factor of 29 between 1940 and 2019

COVID has temporarily reversed some of the catch-up in life expectancy
Expected utility for individual of race $i$:

$$U_i = \sum_{a=0}^{100} S_{ia} \cdot \mathbb{E} \left[ u (c_{ia}, \ell_{ia}) \right]$$

where $S_{ia} = \text{survival rate}$, $c_{ia} = \text{consumption}$ and $\ell_{ia} = \text{leisure}$

Expected utility if consumption is multiplied by factor $\lambda$ at each age:

$$U_i (\lambda) = \sum_{a=0}^{100} S_{ia} \cdot \mathbb{E} \left[ u (\lambda c_{ia}, \ell_{ia}) \right]$$
Consumption-equivalent welfare

How to adjust consumption of White Americans for them to be indifferent between living their lives in the conditions faced by Black Americans and their own?

\[ U_W (\lambda_{EV}) = U_B (1) \]

Analogously, how to adjust consumption of Black Americans for them to reach the same indifference point as White Americans?

\[ U_W (1) = U_B (1/\lambda_{CV}) \]

Our consumption-equivalent welfare statistic geo-averages \( \lambda_{EV} \) and \( \lambda_{CV} \)
Main datasets

Welfare calculation requires data on mortality, consumption and leisure

- Mortality: Centers for Disease Control and Prevention (CDC)
- Consumption: Consumer Expenditure Surveys (CEX)
- Leisure: Current Population Surveys (CPS)
- Primary period: 1984 to 2019
- Groups: Black and White Americans (both groups include Latinx)
Life expectancy by race

Years

White

Black
Per capita consumption by race
Current Population Surveys (CPS)

- Rotating panel of about 60,000 households

- Leisure \( \equiv \frac{5,840 - \text{hours worked in the year}}{5,840} \)
  - \( 5,840 = 16 \text{ hours per day} \cdot 365 \text{ days} \)

- e.g., 40 hours a week for 48 weeks \( \rightarrow \) 67% of waking time is leisure

- Divide leisure equally among all 25 to 64 year olds in the household
Leisure by race
Flow utility

\[ u(c, \ell) = \bar{u} + \log(c) + v(\ell) \]

where \[ v(\ell) = -\frac{\theta \epsilon}{1 + \epsilon} \cdot (1 - \ell)^{\frac{1+\epsilon}{\epsilon}} \]

- Death is normalized to zero
- \( \epsilon \) is the constant Frisch elasticity of labor supply
### Calibration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Value</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frisch elasticity</td>
<td>$\epsilon$</td>
<td>1.0</td>
<td>Hall (2009) and Chetty et al. (2012)</td>
</tr>
<tr>
<td>Leisure utility weight</td>
<td>$\theta$</td>
<td>14.2</td>
<td>Jones and Klenow (2016)</td>
</tr>
<tr>
<td>Flow utility intercept</td>
<td>$\bar{u}$</td>
<td>6.23</td>
<td>VSL of $7.4M in 2006 (EPA)</td>
</tr>
</tbody>
</table>

- Leisure: one percentage point is worth about 1.6% of consumption in 2019
- Intercept: one year of life is worth 6.23 years of consumption in 2019
Definitions

Survival rates normalized by White life expectancy:

\[ s_{Ba} \equiv \frac{S_{Ba}}{\sum_a S_{Wa}} \quad \text{and} \quad \Delta s_{Ba} \equiv \frac{S_{Ba} - S_{Wa}}{\sum_a S_{Wa}} \]

Average lifetime utility from consumption and leisure:

\[ \mathbb{E}\log(c_i) \equiv \sum_a s_{Wa} \cdot \mathbb{E}[\log(c_{ia})] \quad \text{and} \quad \mathbb{E}\nu(\ell_i) \equiv \sum_a s_{Wa} \cdot \mathbb{E}[\nu(\ell_{ia})] \]

Average lifetime consumption and leisure:

\[ \bar{c}_i \equiv \sum_a s_{Wa} \cdot \mathbb{E}[c_{ia}] \quad \text{and} \quad \bar{\ell}_i \equiv \sum_a s_{Wa} \cdot \mathbb{E}[\ell_{ia}] \]
Decomposition

\[
\log(\lambda_{EV}) = \sum_a \Delta s_{Ba} \cdot \mathbb{E}[u(c_{Ba}, \ell_{Ba})] + \log(\bar{c}_B) - \log(\bar{c}_W) + v(\bar{\ell}_B) - v(\bar{\ell}_W) + \mathbb{E} \log(c_B) - \log(\bar{c}_B) - [\mathbb{E} \log(c_W) - \log(\bar{c}_W)] + \mathbb{E} v(\ell_B) - v(\bar{\ell}_B) - \left[ \mathbb{E} v(\ell_W) - v(\bar{\ell}_W) \right]
\]

Life expectancy

Consumption

Leisure

Consumption inequality

Leisure inequality
Black welfare relative to White welfare
Black relative to White welfare, income and wealth

![Graph showing trends in Black relative to White welfare, income, and wealth from 1985 to 2019. The graph includes lines for Income, Welfare, and Wealth with corresponding scale on the right side.](image-url)
Relative welfare decomposition

Leisure
Inequality
Life expectancy
Consumption

0.4 0.6 0.8 1.0
### Welfare growth between 1984 and 2019 (in % per year)

<table>
<thead>
<tr>
<th></th>
<th>Welfare</th>
<th>Income</th>
<th>LE</th>
<th>c</th>
<th>σ (c)</th>
<th>l</th>
<th>σ (l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>3.39</td>
<td>2.30</td>
<td>1.22</td>
<td>2.49</td>
<td>-0.03</td>
<td>-0.17</td>
<td>-0.12</td>
</tr>
<tr>
<td>White</td>
<td>2.32</td>
<td>1.62</td>
<td>0.78</td>
<td>1.84</td>
<td>-0.10</td>
<td>-0.12</td>
<td>-0.08</td>
</tr>
<tr>
<td>Gap</td>
<td>1.08</td>
<td>0.67</td>
<td>0.44</td>
<td>0.66</td>
<td>0.07</td>
<td>-0.05</td>
<td>-0.04</td>
</tr>
</tbody>
</table>
A longer view with more limited data

U.S. Census microdata goes back further in time:

- Decadal: 1940 to 2000
- Annual American Community Survey (ACS): 2005 to 2019
- Here we impute consumption from Census income
- Coefficients from consumption on income in the CEX 1984–2019
- Omit the inequality terms
Life expectancy

Years

White

Black
Imputing consumption from income and demographics

Run this simple regression on CEX data from 1984–2019:

\[
\frac{c_{it} - \bar{c}_t}{\bar{c}_t} = \beta \cdot \frac{y_{it} - \bar{y}_t}{\bar{y}_t} + \sum_x \alpha_x \cdot \frac{x_{it} - \bar{x}_t}{\bar{x}_t} + \epsilon_{it} \quad \text{for} \quad x_{it} = \{\text{race, gender, age}\}
\]

- \( \hat{\beta} = 0.301 (0.001) \)
- \( R^2 = 0.249 \)

Impute consumption from fitted values using Census data for 1940 onward
Imputed consumption per capita
Black relative to White welfare

Using CEX

Census imputed
Relative welfare decomposition

- Leisure
- Life expectancy
- Consumption
Cumulative welfare growth
## COVID-19 and welfare

<table>
<thead>
<tr>
<th></th>
<th>Deaths per thousand</th>
<th>Age of victims</th>
<th>Years lost per victim</th>
<th>Lower lifespan</th>
<th>Welfare loss (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black non-Latinx</td>
<td>1.99</td>
<td>71.4</td>
<td>15.6</td>
<td>2.5</td>
<td>17.7</td>
</tr>
<tr>
<td>White non-Latinx</td>
<td>1.72</td>
<td>79.2</td>
<td>11.2</td>
<td>1.4</td>
<td>10.0</td>
</tr>
<tr>
<td>Latinx</td>
<td>1.68</td>
<td>68.9</td>
<td>20.1</td>
<td>4.3</td>
<td>26.6</td>
</tr>
<tr>
<td>All groups</td>
<td>1.69</td>
<td>75.8</td>
<td>14.2</td>
<td>2.0</td>
<td>14.1</td>
</tr>
</tbody>
</table>

Note: From April 2020 to March 2021, the CDC reports a total of 557,055 COVID-19 deaths.
Extensions (more speculative)

- Morbidity
- Incarceration
- Unemployment
Health and Activity Limitations Index (HALex)

\[
\text{HALex} = \alpha + (1 - \alpha) \times [0.41 \times (P + A) + 0.18 \times P \times A]
\]

HALex = 0.1

1. Personal health assessment \((P)\) goes from 0 to 1:
   - 5 answers from “poor” \((P = 0)\) to “excellent” \((P = 1)\)

2. Activity limitations \((A)\) also goes from 0 to 1:
   - Limited in non-work activities
   - Limited in work
   - Unable to work
   - Limited in household chores, shopping, etc.
   - Limited in eating, bathing, dressing, etc.
Health and Activity Limitations Index (HALex)
HALex-adjusted life expectancy

Years

White

Black

60
65
70
75
80
Morbidity and welfare

Expected utility with morbidity:

\[ U_i = \mathbb{E} \sum_{a=0}^{100} S_{ia} \cdot Q_{ia} \cdot u(c_{ia}, \ell_{ia}) \]

\[ Q_{ia} = \text{compressed or stretched HALex}_{ia} \]
Black relative welfare in 2018 with QALYs

The diagram shows a line graph with the x-axis representing worst morbidity (%) ranging from 0 to 100, and the y-axis representing a value that increases from 0.50 to 0.70. The graph indicates a positive correlation between worst morbidity and the represented value.
Morbidity and the Black-White welfare gap (with $\alpha = 0.1$)
Incarceration rates for the 18 and over population

Percent

Black non-Latinx

White non-Latinx
Incarceration and welfare

Expected utility with incarceration:

\[ U_i = \mathbb{E} \sum_{a=0}^{100} S_{ia}[(1 - I_{ia})u(c_{ia}, \ell_{ia}) + I_{ia}u_{ia}^I] \]

where \( I_{ia} = \) incarceration rate and \( u_{ia}^I = \) incarcerated flow utility

Incarcerated flow utility is some fraction of average flow utility for individuals of all groups with high school education or less
The effect of incarceration on Black relative welfare in 2018
Broad unemployment rates
The effect of unemployment on Black relative welfare in 2019

Percent

Fraction of extra time treated as leisure (%)
Recap of results

- Black welfare started at 45% of White welfare in 1984, rose to 64% by 2019
  - Progress from rising relative consumption and life expectancy

- Black welfare was only 28% of White welfare in 1940 (limited data)
  - Black welfare increased by a factor of 30 between 1940 and 2019

- COVID mortality has temporarily lowered Black welfare by 18%
  - 10% for White welfare

- Morbidity and incarceration could make the gaps even larger