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)
- Wealth: Barsky, Bound, Charles and Lupton (2002), Aliprantis et al. (2019)
- 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 biggest sources?

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

Preview of our results

- Black welfare started at 43% of White welfare in 1984, rose to 59% by 2019
  - Progress from rising relative consumption and life expectancy
- Black welfare was only 29% of White welfare in 1940 (more limited data)
  - Black welfare increased by a factor of 26 between 1940 and 2019
- COVID-19 has temporarily reversed some of the catch-up in life expectancy
  - Lowered Black welfare by 18%, White welfare by 12%

Framework

Expected utility for individual of race i:

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

where S_{ia} = survival rate, c_{ia} = consumption, and ℓ_{ia} = leisure

Expected utility if consumption is multiplied by factor λ at each age:

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

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 λ_{EV} and λ_{CV}

Main datasets

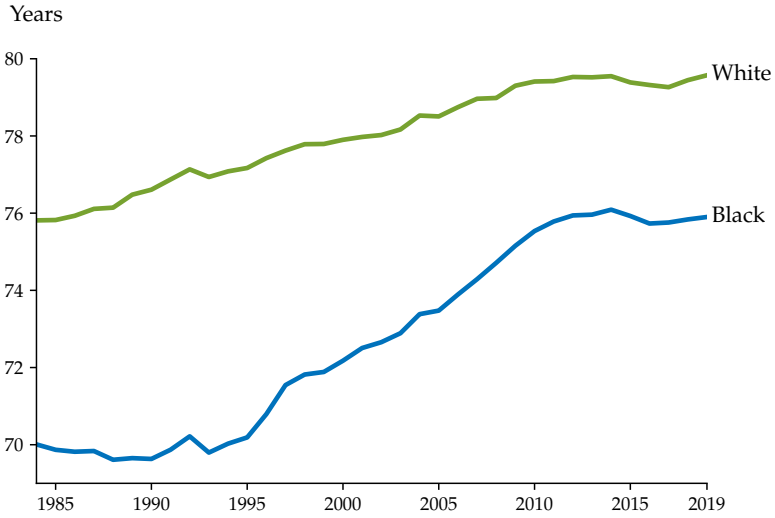
- Mortality: Centers for Disease Control and Prevention (CDC)
- Consumption: Consumer Expenditure Surveys (CEX)
- Leisure: Current Population Surveys (CPS)
- Primary period: 1984 to 2019
- Groups: Black and White Americans (both include Latinx)

Centers for Disease Control and Prevention (CDC)

- Life Tables for each age in each year
- Deaths (D) and population-at-risk estimates (P)
- Probability of surviving up to age a:

$$S_a = \prod_{age=0}^{a} \left(1 - M_{age}\right) \quad \text{where} \quad M_{age} = D_{age}/P_{age}$$

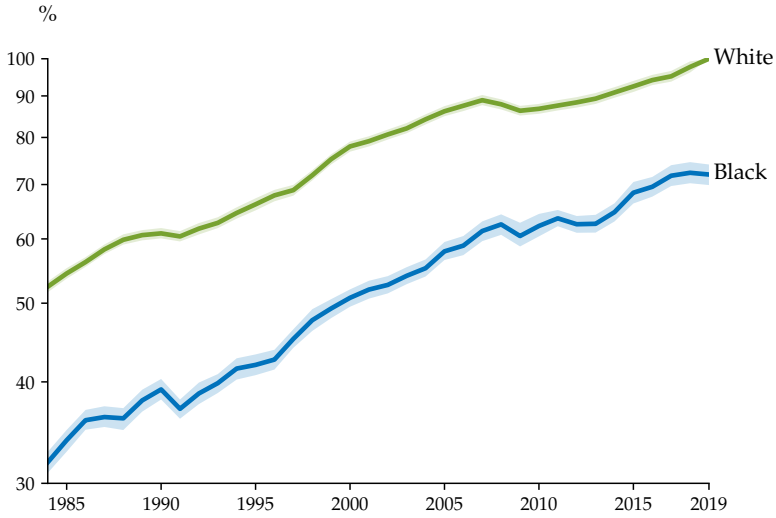
Life expectancy by race



Consumer Expenditure Surveys (CEX)

- Rotating panel of about 20,000 households
- Divide consumption equally among all household members
- Include durables for levels, but exclude them for dispersion within groups
- Scale up to NIPA real consumption per capita in each year
  - Results are robust to scaling up category by category

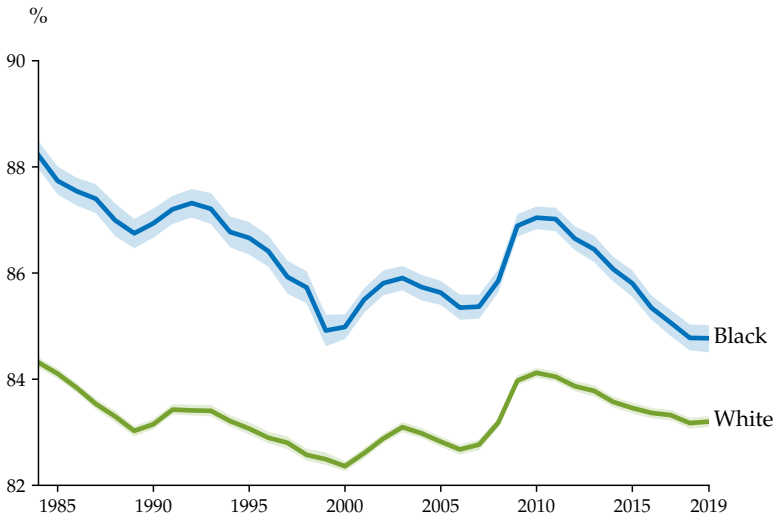
Per capita consumption by race



Current Population Surveys (CPS)

- Rotating panel of about 60,000 households
- Leisure $\equiv$ (5,840 – hours worked in the year)/5,840
  - 5,840 = 16 hours per day $\cdot$ 365 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

$$u(c, \ell) = \overline{u} + \log(c) + v(\ell)$$

$$\text{where} \quad v(\ell) = -\frac{\theta\epsilon}{1+\epsilon} \cdot (1-\ell)^{\frac{1+\epsilon}{\epsilon}}$$

- Death is normalized to zero
- ϵ is the constant Frisch elasticity of labor supply

Calibration

Parameter	Symbol	Value	Source
Frisch elasticity	ϵ	1.0	Hall (2009) and Chetty et al. (2012)
Leisure utility weight	θ	8.8	Labor-Leisure F.O.C.
Flow utility intercept	$\overline{u}$	6.02	VSL of \$7.4M in EPA (2006)

- Leisure: one percentage point is worth about 1.6% of consumption in 2019
- Intercept: 1 year of life is worth 6.02 years of 2019 consumption

Calibrating $\overline{u}$ from the VSL

With no discounting, growth, leisure, or inequality:

$$U = \sum_{a=0}^{\infty} S_a \cdot u(c) = e \cdot u(c) = e \cdot [\overline{u} + \log(c)]$$

Slope of the indifference curve $\mathrm{d}U = 0$ at $c = 1$ implies:

$$\frac{\mathrm{d}c}{c} = \frac{u(c)}{u'(c) \cdot c} \cdot \frac{\mathrm{d}e}{e} = \overline{u} \cdot \frac{\mathrm{d}e}{e}$$

1% higher LE is equivalent to $\overline{u}$ % higher consumption; in 2006 we get

$$\overline{u} = \frac{u(c)}{u'(c) \cdot c} = \frac{\mathrm{VSLY}}{c} \approx \frac{\mathrm{VSL}/e_{40}}{c} \approx \frac{\$7,400,000/40}{\$30,000} = \frac{\$185,000}{\$30,000} \approx 6.2$$

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:

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

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

$$\log(\lambda_{EV}) = \sum_a \Delta s_{Ba} \cdot \mathbb{E}[u(c_{Ba}, \ell_{Ba})]$$ Life expectancy

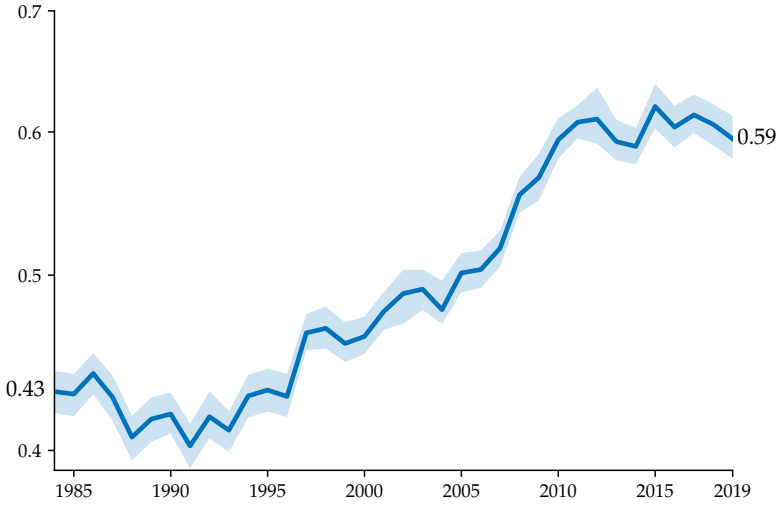
$$+ \log(\bar{c}_B) - \log(\bar{c}_W)$$ Consumption

$$+ v(\bar{\ell}_B) - v(\bar{\ell}_W)$$ Leisure

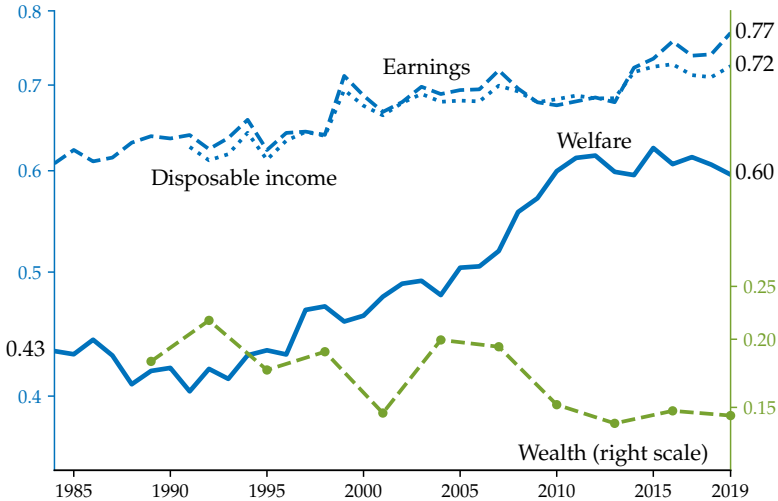
$$+ \mathbb{E}\log(c_B) - \log(\bar{c}_B) - [\mathbb{E}\log(c_W) - \log(\bar{c}_W)]$$ Consumption inequality

$$+ \mathbb{E}\, v(\ell_B) - v(\bar{\ell}_B) - \left[\mathbb{E}\, v(\ell_W) - v(\bar{\ell}_W)\right]$$ Leisure inequality

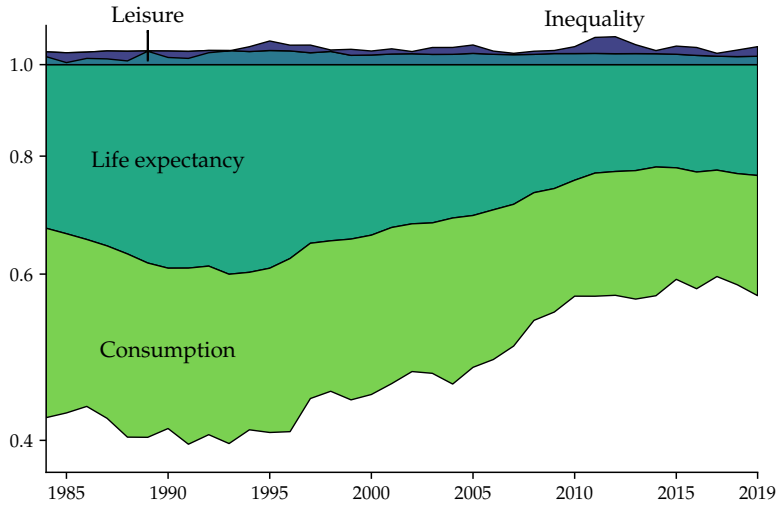
Black welfare relative to White welfare



Relative welfare, earnings, income and wealth



Relative welfare decomposition



Relative welfare decomposition in 1984, 2000, and 2019

			Decomposition				
	λ	$\log(\lambda)$	LE	c	$\sigma(c)$	ℓ	$\sigma(\ell)$
2019	0.59	-0.52	-0.27	-0.29	0.02	0.02	0.00
2000	0.46	-0.77	-0.42	-0.39	0.01	0.02	0.00
1984	0.43	-0.84	-0.40	-0.46	-0.02	0.03	0.01

Welfare growth between 1984 and 2019 (in % per year)

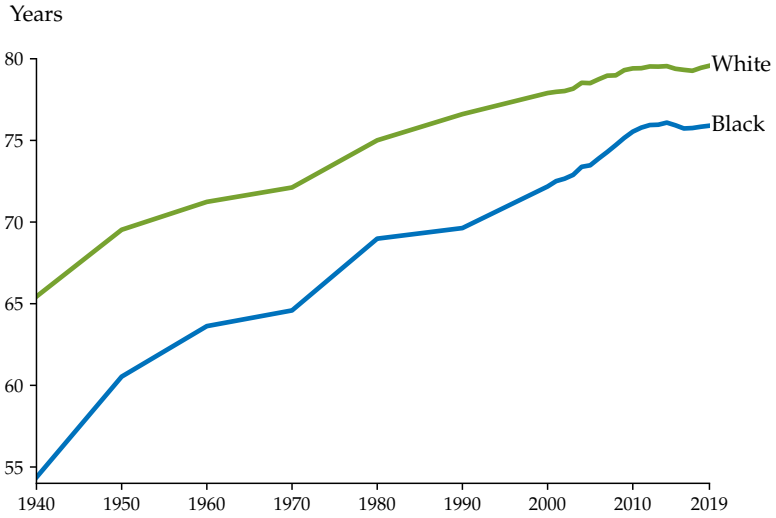
			Decomposition				
	Welfare	Earnings	LE	c	$\sigma(c)$	ℓ	$\sigma(\ell)$
Black	3.26	2.01	1.20	2.25	-0.05	-0.09	-0.06
White	2.29	1.35	0.77	1.78	-0.18	-0.06	-0.04
Gap	0.97	0.67	0.43	0.46	0.13	-0.02	-0.02

A longer view with more limited data

U.S. Census micro data goes back further in time:

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

Life expectancy



Imputing consumption from earnings and demographics

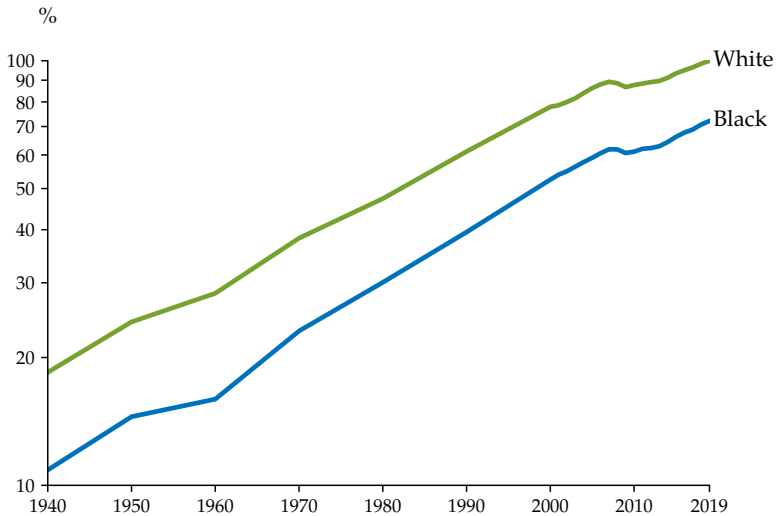
Run this simple regression on CEX data from 1984 to 2019:

$$\frac{c_{it} - \bar{c}_t}{\bar{c}_t} = \beta \cdot \frac{y_{it} - \bar{y}_t}{\bar{y}_t} + \sum_x \alpha_x \cdot \frac{x_{it} - \bar{x}_t}{\bar{x}_t} + \epsilon_{it}$$

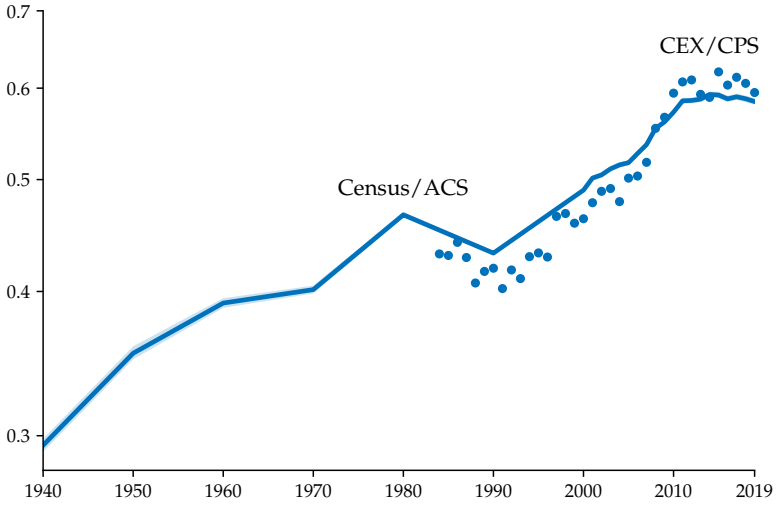
- $x_{it} = \{\text{race, gender, education, family size, age}\}$
- $\widehat{\beta} = 0.292\ (0.001)$
- $R^2 = 0.342$

Impute consumption from fitted values using Census data for 1940 onward

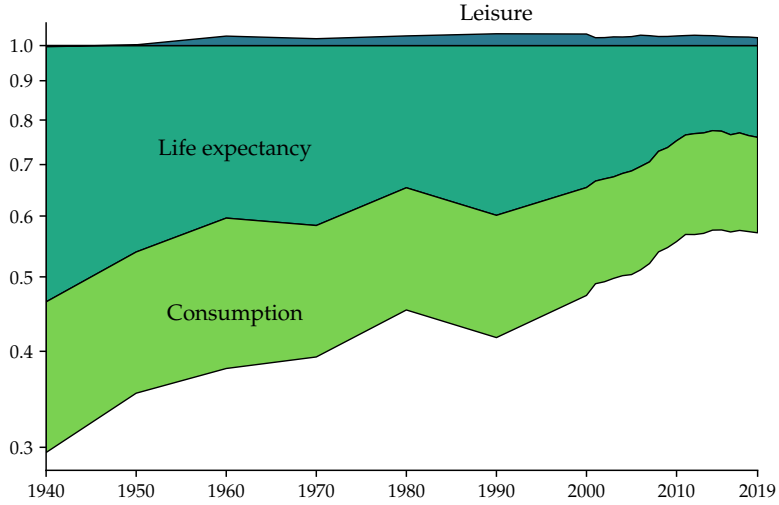
Imputed consumption per capita



Black relative to White welfare



Relative welfare decomposition

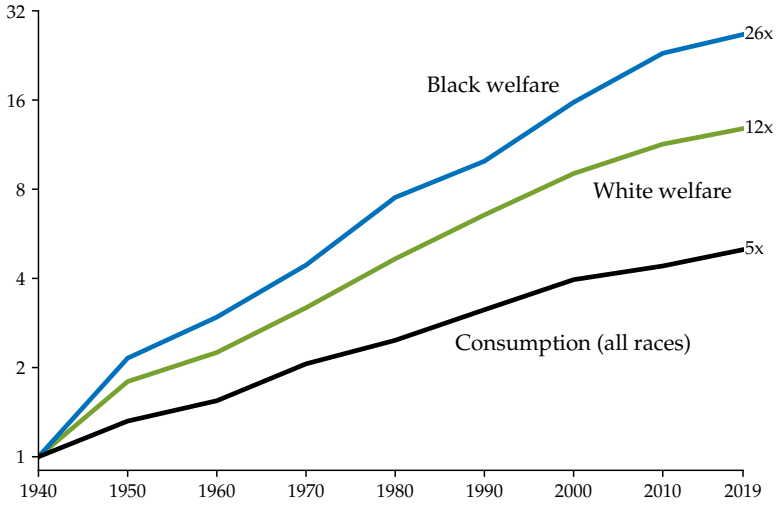


Welfare growth between 1940 and 2019

	1940–1980				1940–2019			
	λ	LE	c	ℓ	λ	LE	c	ℓ
Black	5.15	2.67	2.47	0.02	4.33	2.11	2.24	-0.03
White	3.87	1.65	2.28	-0.06	3.29	1.30	2.05	-0.06
Gap	1.27	1.01	0.18	0.08	1.04	0.81	0.19	0.04

Note: Column λ is decomposed in columns LE, c and ℓ.

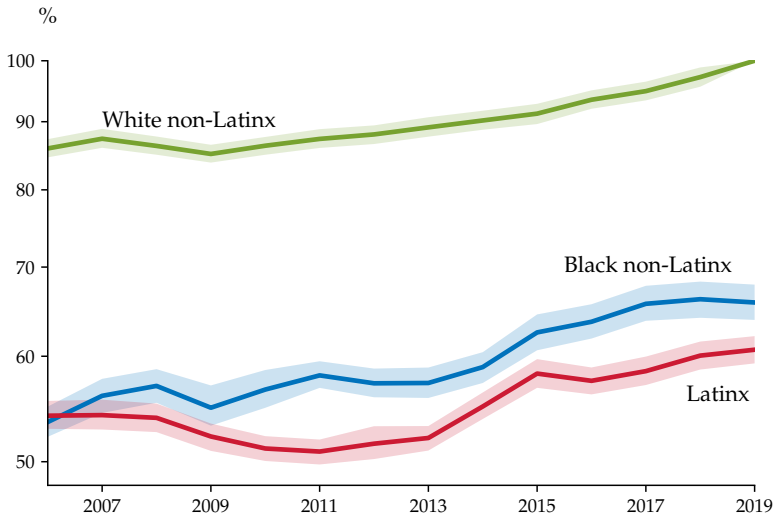
Cumulative welfare growth



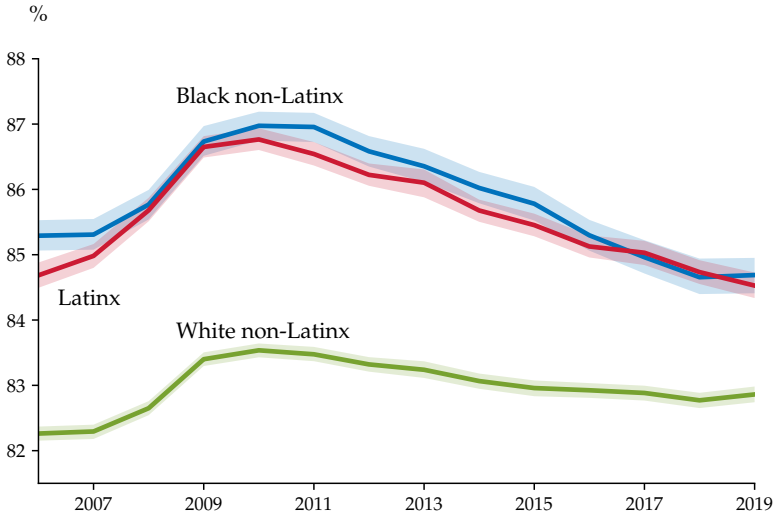
COVID-19 and welfare

			Decomposition				
	λ	$\log(\lambda)$	LE	c	$\sigma(c)$	ℓ	$\sigma(\ell)$
Black	0.83	-0.19	-0.23	0.01	0.01	0.01	0.01
White	0.87	-0.13	-0.12	-0.05	0.02	0.01	0.01
Black non-Latinx	0.82	-0.20	-0.24	0.01	0.01	0.01	0.01
White non-Latinx	0.88	-0.12	-0.10	-0.06	0.02	0.01	0.01
Latinx	0.80	-0.22	-0.25	-0.00	0.00	0.02	0.01

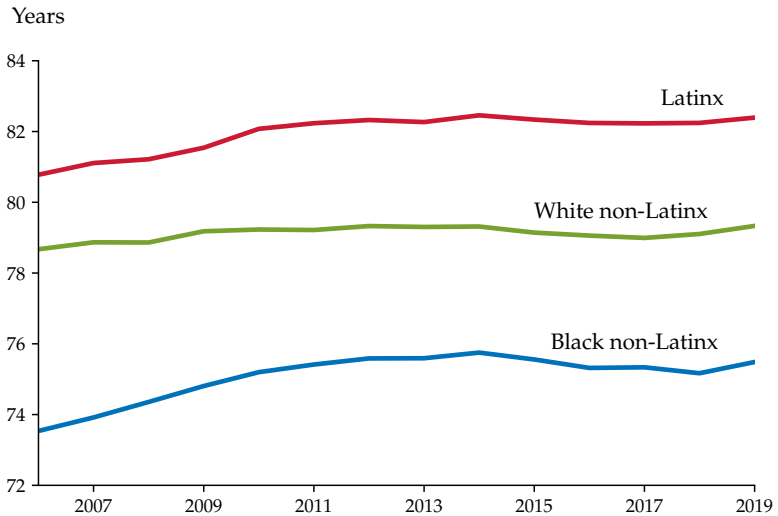
Per capita consumption with Latinx as a separate group



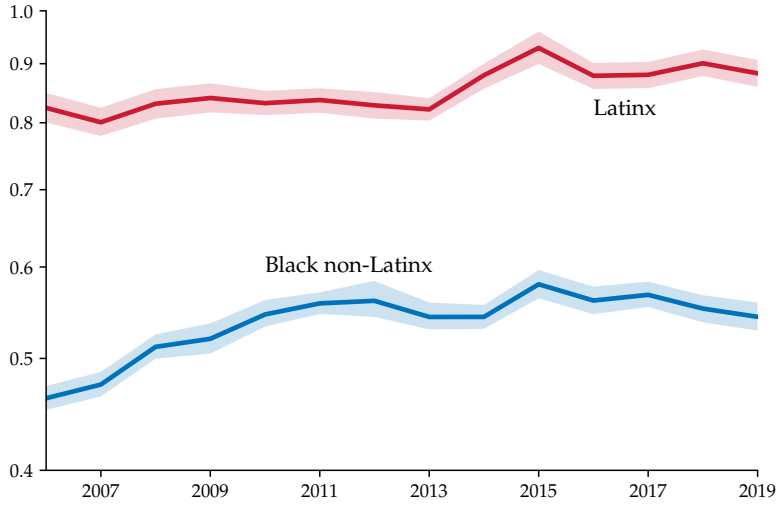
Leisure with Latinx as a separate group



Life expectancy with Latinx as a separate group



Black and Latinx welfare relative to White welfare



Extensions (more speculative)

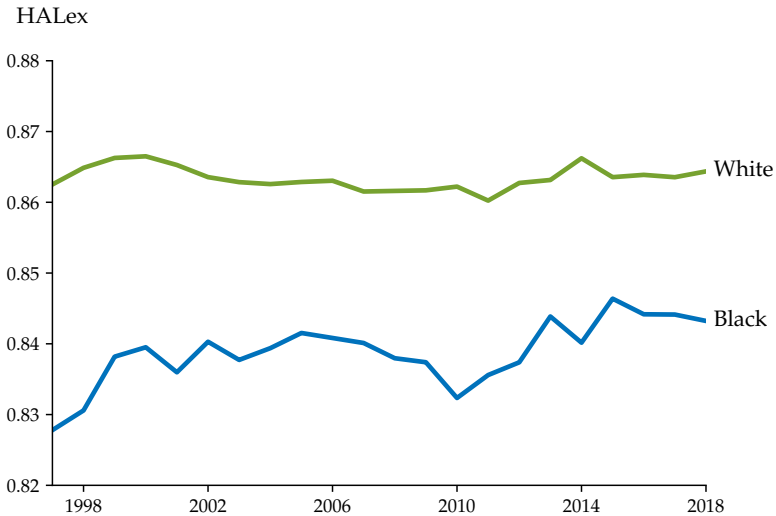
- Morbidity
- Incarceration
- Unemployment

Health and Activity Limitations Index (HALex)

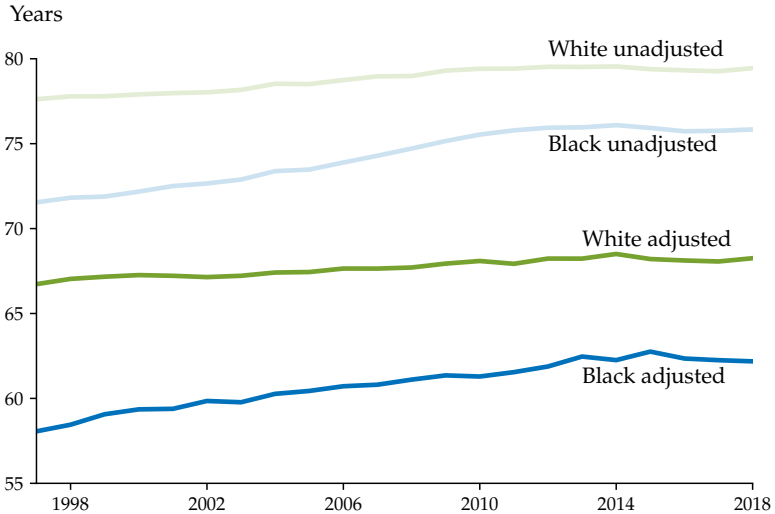
$$\text{HALex} = \underbrace{\alpha}_{\text{HALex} = 0.1} + (1-\alpha) \times [0.41 \times (P + A) + 0.18 \times P \times A]$$

1. Personal health assessment (P) goes from 0 to 1:
   - 5 answers from "poor" ($P = 0$) to "excellent" ($P = 1$)
2. Activity limitations (A) go 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



Morbidity and welfare

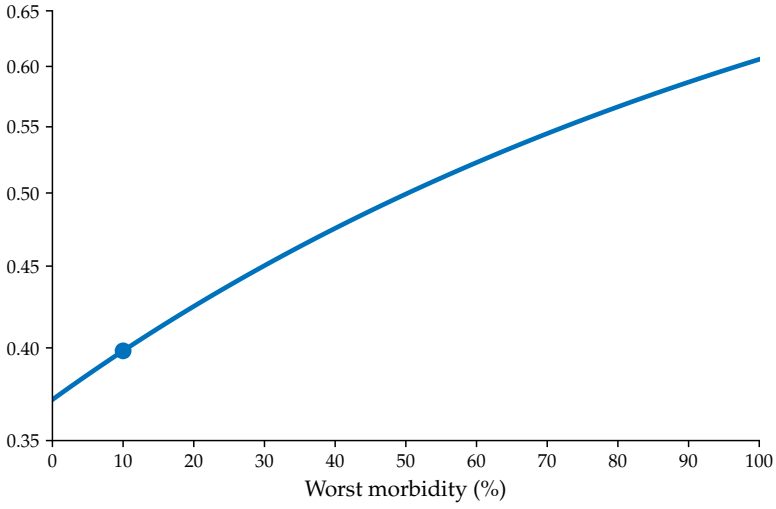
Expected utility with morbidity:

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

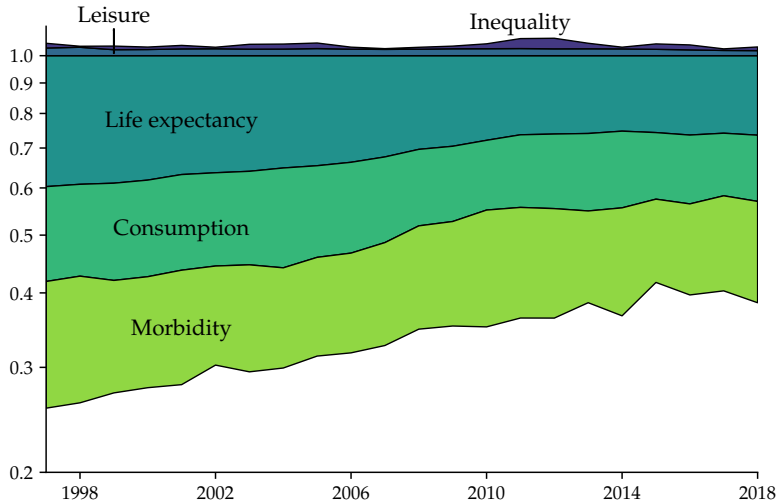
Q_{ia} = compressed or stretched HALex_{ia}

- compressed $\Rightarrow \alpha > 0.1$, stretched $\Rightarrow \alpha < 0.1$

Black relative welfare in 2018 with QALYs



Morbidity and the Black-White welfare gap (with $\alpha = 0.1$)



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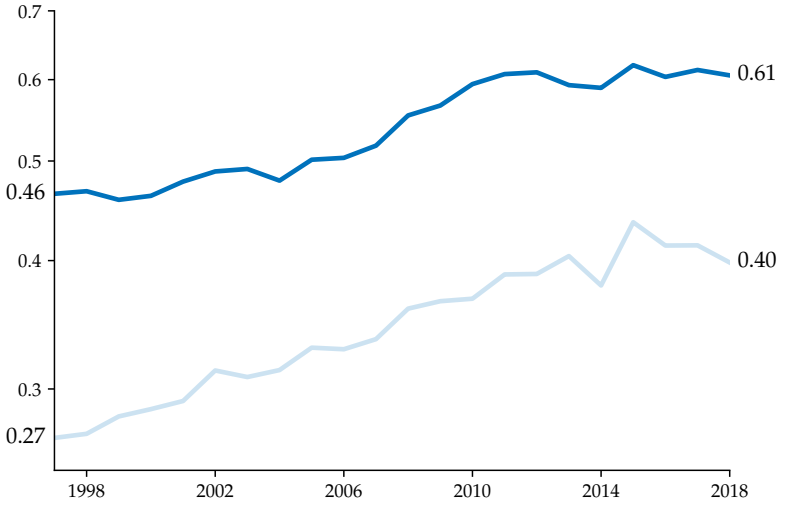
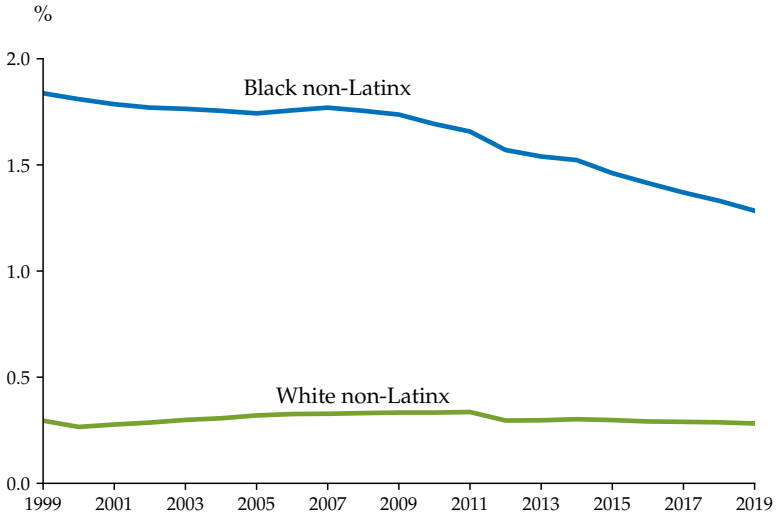


Incarceration rates for the 18 and over population



Incarceration and welfare

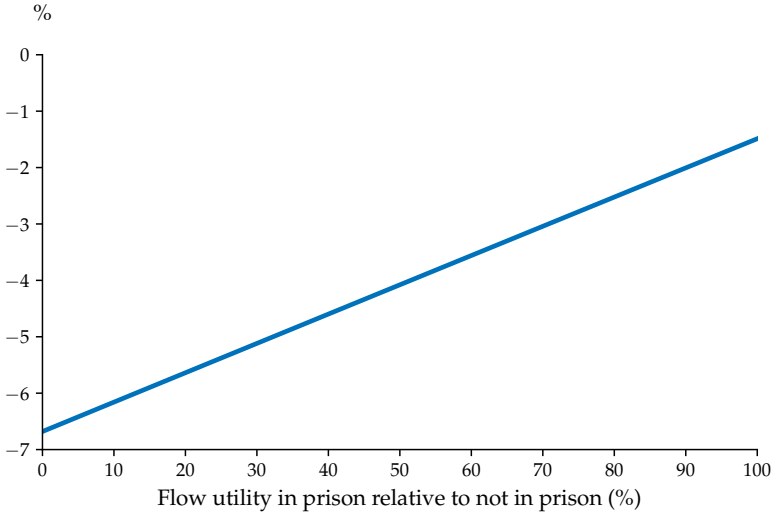
Expected utility with incarceration:

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

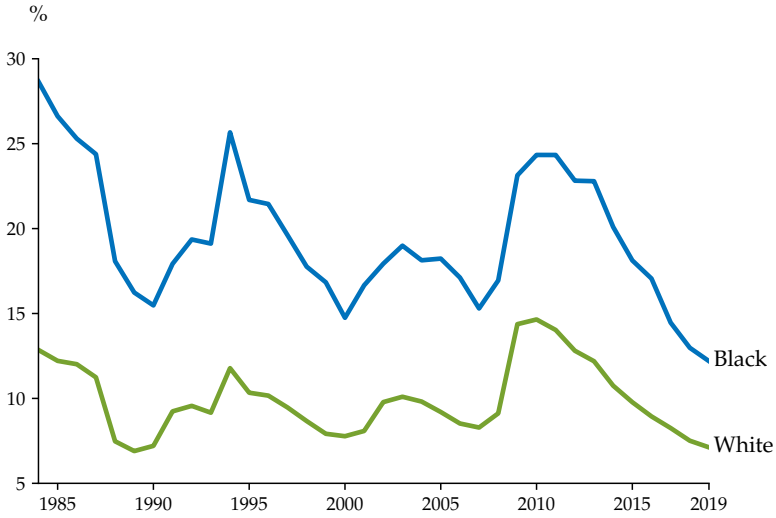
where I_{ia} = incarceration rate and u_a^I = incarcerated flow utility

Incarcerated flow utility is some *fraction* of average flow utility for individuals with high school education or less

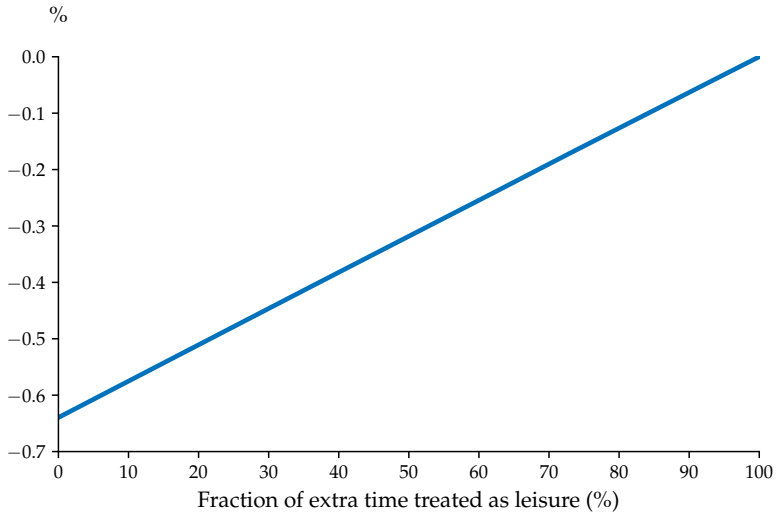
The effect of incarceration on Black relative welfare in 2018



Broad unemployment rates



The effect of unemployment on Black relative welfare in 2019



Recap of results

- Black welfare started at 43% of White welfare in 1984, rose to 59% by 2019
  - Progress from rising relative consumption and life expectancy
- Black welfare was only 29% of White welfare in 1940 (limited data)
  - Black welfare increased by a factor of 26 between 1940 and 2019
- COVID mortality has temporarily lowered Black welfare by 18%
  - 12% for White welfare
- Morbidity and incarceration make the gaps even larger

Potential policy implications

- Quantifying welfare loss due to past and present discrimination
  - Potential welfare gains from eliminating this misallocation
- Quantifying sources of the welfare gap
  - Helpful for gauging benefits of competing policies