

The Work of the Future:

Challenges and Opportunities for Workers with Disabilities in the 'Robot-ificial' Intelligence Era

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Disability Research Center Annual Meeting

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Outline

1) Context: What has happened to the employment of adults with work limitations – and why?

- The role of aging
- The role of education
- The role of occupational change
- The SSDI program

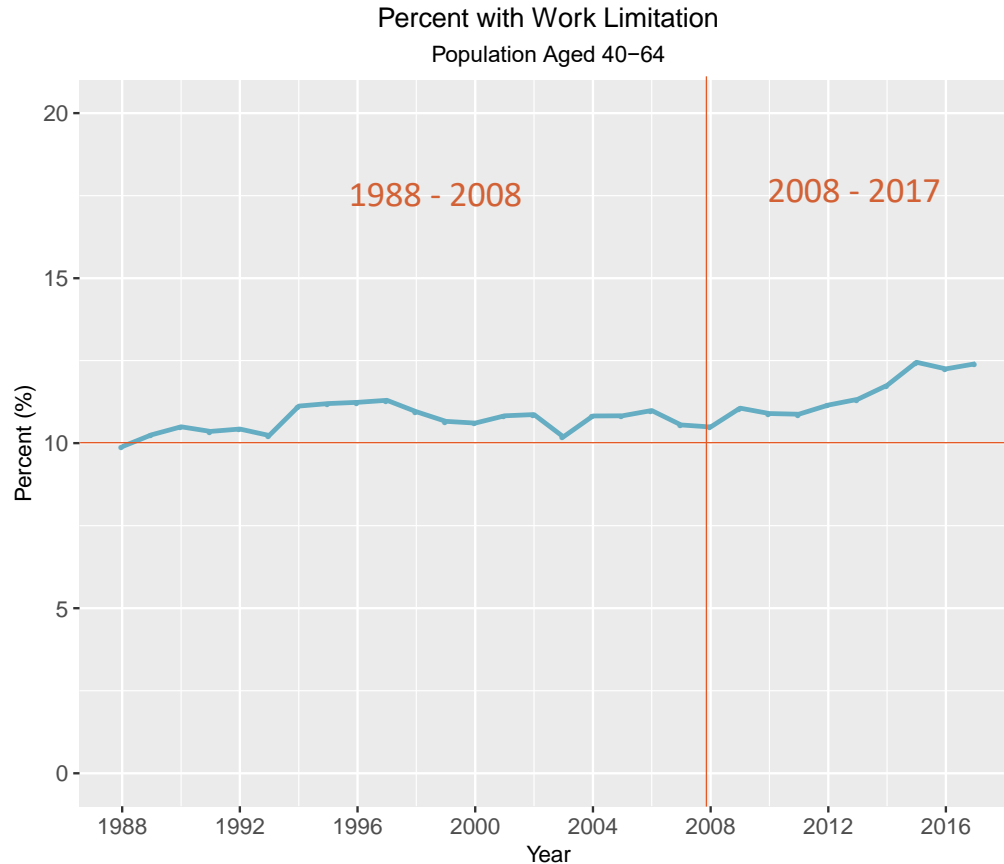
2) Challenges ahead

- The "hollowing" labor market
- Opportunities for high-skill work
- Opportunities for service-oriented work

3) Assisting the workers of the future

- Assistive technologies
- The medical-vocational grid

The Surprising Stability of Self-Reported Work Limitations Among U.S. Adults 40 - 64, 1988 – 2017

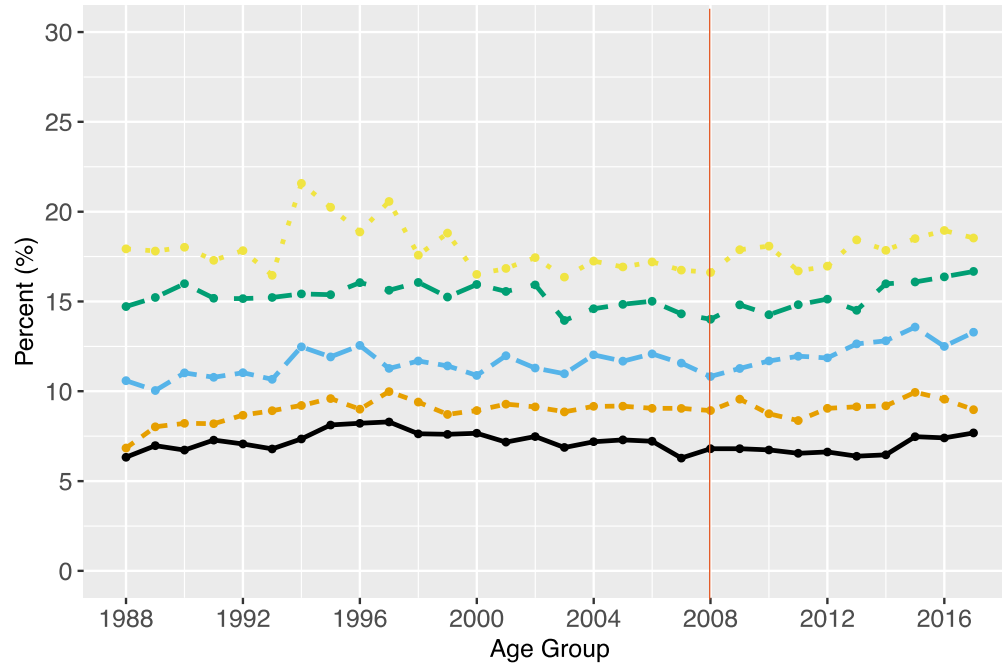


Despite pop'n aging

- *Almost no rise* in self-reported work limitations between 1988 – 2008
- Work limitation trends upward *only in last decade, 2008 – 2017*

Frequency of Self-Reported Work Limitations Also Remarkably Stable by Age Group, 1988 – 2017

Frequency of Work Limitations by Age Group
Aged 40–61



Age 60 – 61

Age 55 – 59

Age 50 – 54

Age 45 – 49

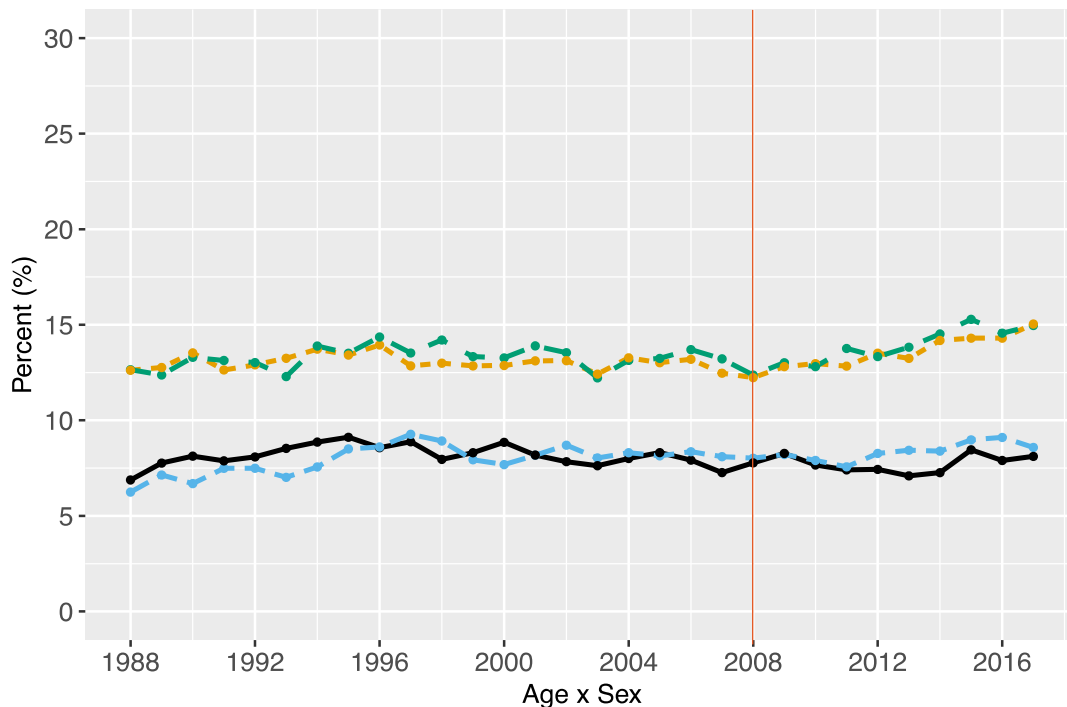
Age 40 – 44

Source: Current Population Survey, IPUMS



Similarly Stable by Gender, with Some Rise after 2008

Frequency of Work Limitations by Age x Sex
Aged 40–61



Women Ages 50 - 59

Men ages 50 – 59

Women ages 40 – 49

Men ages 40 – 49

Source: Current Population Survey, IPUMS



But Employment of Work-Limited Adults Fell from 1992 – 2012, then Rebounded after 2012



Source: Current Population Survey, IPUMS

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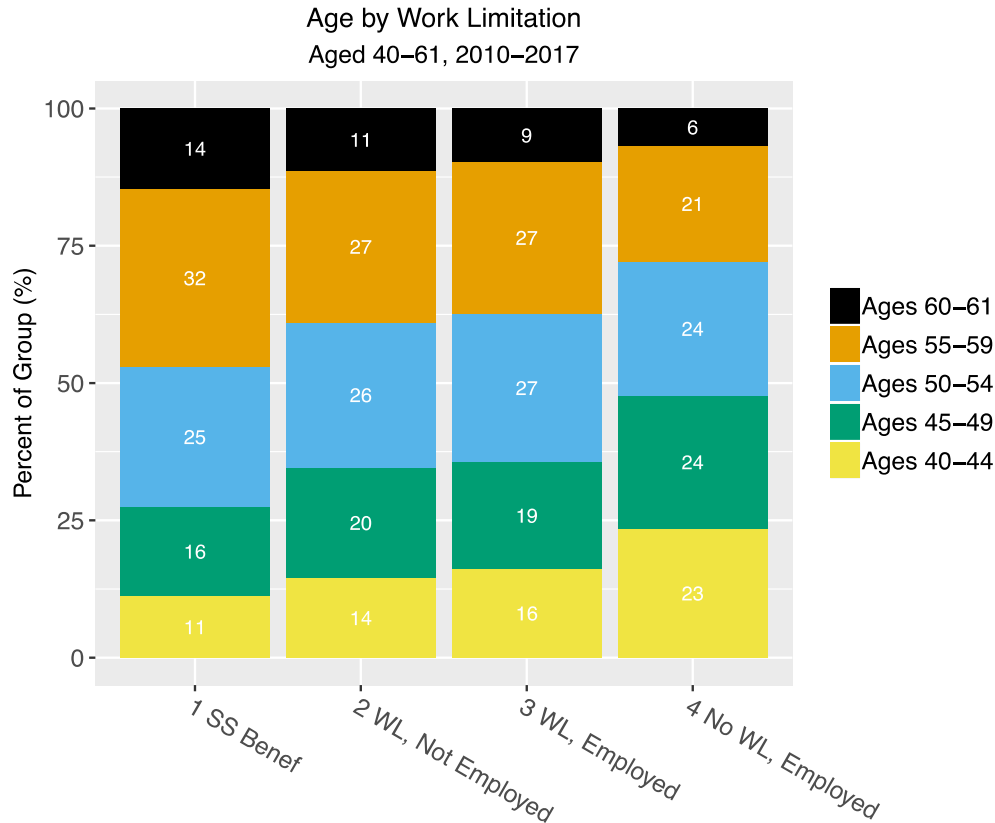
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Even Among Those Ages 40 – 61, Adults with Work Limitations are Older than Average

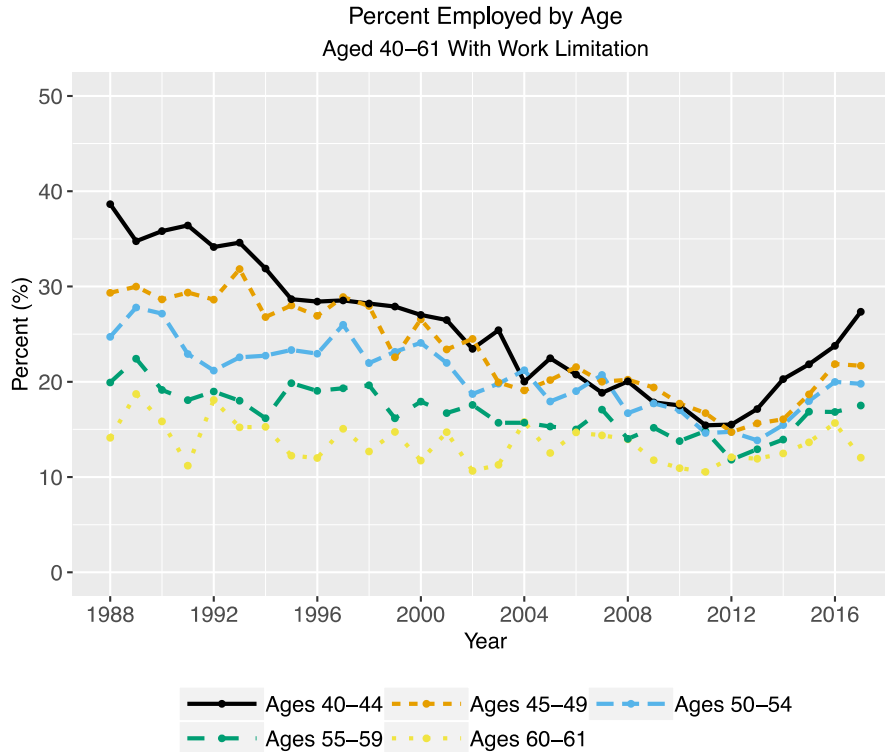


What share are 55+?

- **46% among Soc. Security beneficiaries**
- **38% among Work Limited, not Employed**
- **36% among Work Limited, Employed**
- **27% among Non-Work Limited**

Source: Current Population Survey, IPUMS

Seems Natural that Population Aging Should be Key Cause of Falling Employment among Work-Limited Adults



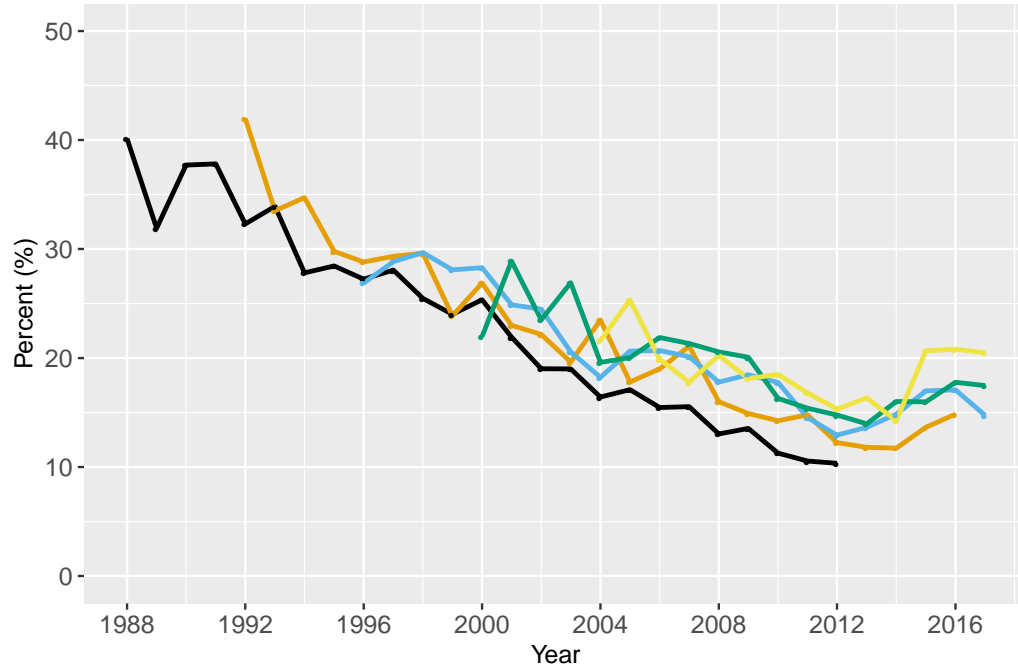
But Aging is Not the Explanation

- Employment fell among *every age bracket* of work-limited adults
- Largest fall among those ages 40-44 (23 pts!)
- And largest rebound among this group after 2012

Source: Current Population Survey, IPUMS

But Employment Fell Uniformly Across Cohorts at Every Age Level

Percent Employed by Birth Cohort
Aged 40–61 With Work Limitation



Cohorts in this figure

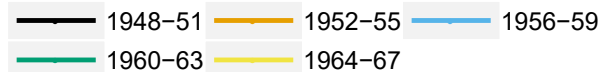
Age 40-43 in 1988

Age 40-43 in 1992

Age 40-43 in 1996

Age 40-43 in 2000

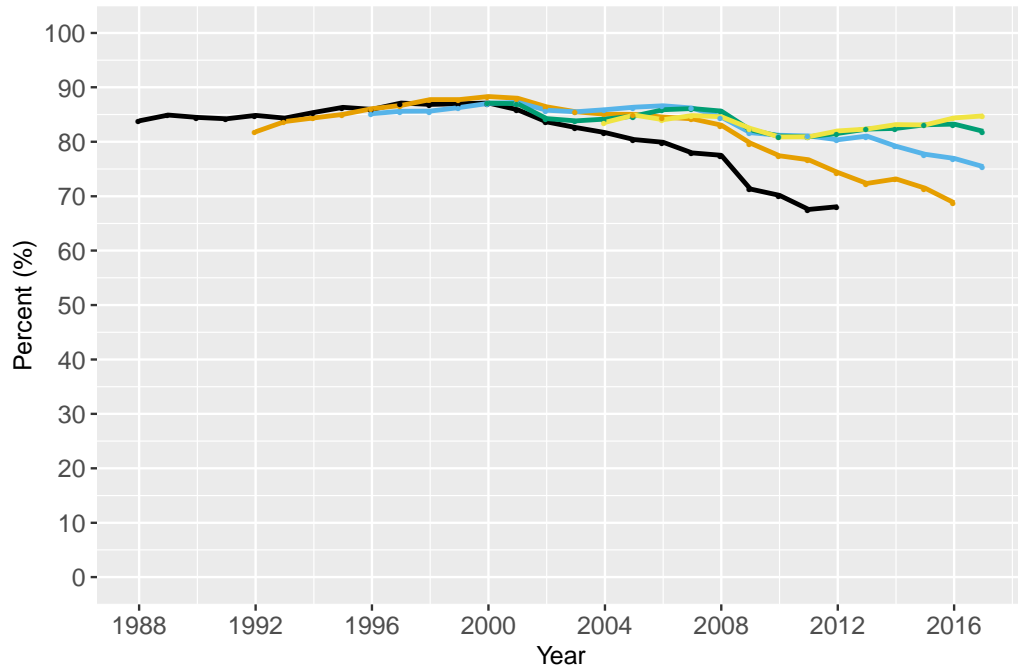
Age 40-43 in 2004



Source: Current Population Survey, IPUMS

Compare to Employment Rates of Adults without Work-Limitations: No Decline in Employment Across Cohorts

Percent Employed by Birth Cohort
Aged 40–61 With No Work Limitation



Cohorts in this figure

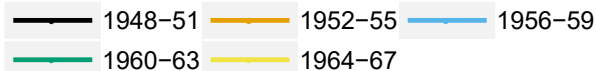
Age 40-43 in 1988

Age 40-43 in 1992

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Age 40-43 in 2000

Age 40-43 in 2004



Source: Current Population Survey, IPUMS

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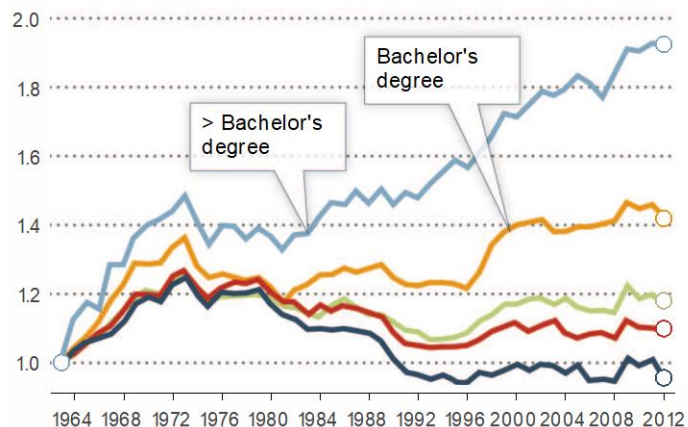
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The Earnings Premium for Higher Education Has Risen *Steeply* since 1980

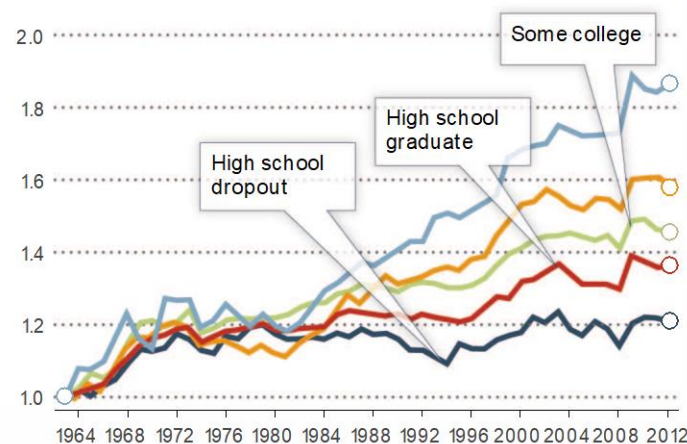
Real weekly earnings relative to 1963 (men)

MEN



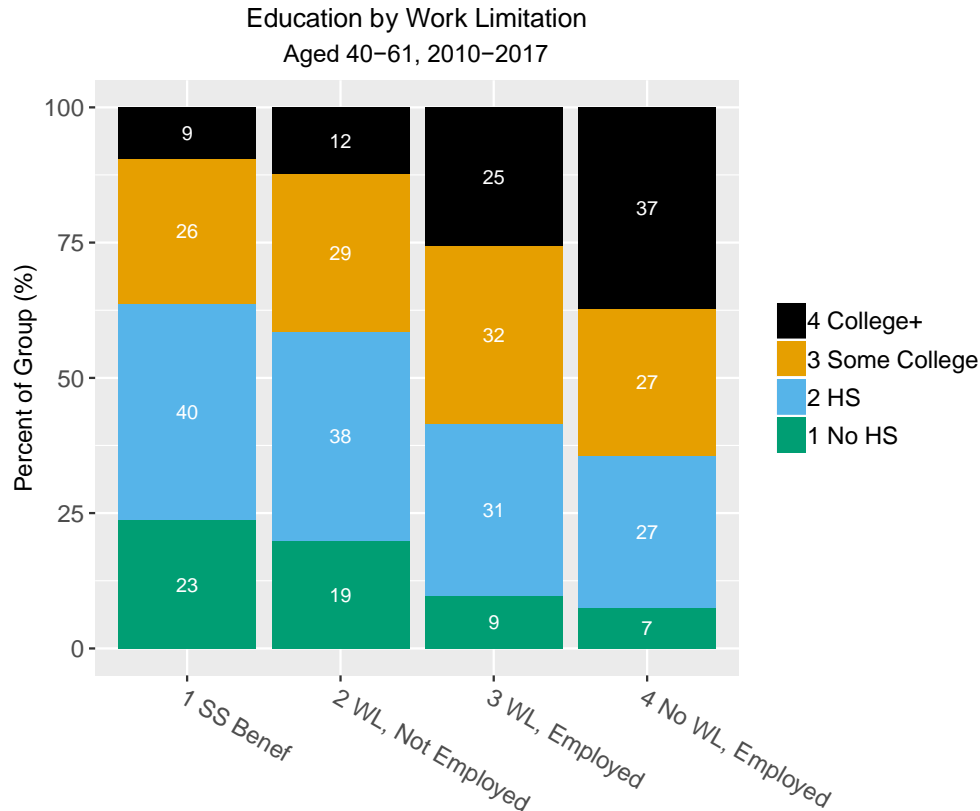
Real weekly earnings relative to 1963 (women)

WOMEN



CPS Annual Demographic File (Autor, 2014)

Adults Ages 40 - 61 with Work Limitations Have Relatively Low Educational Attainment

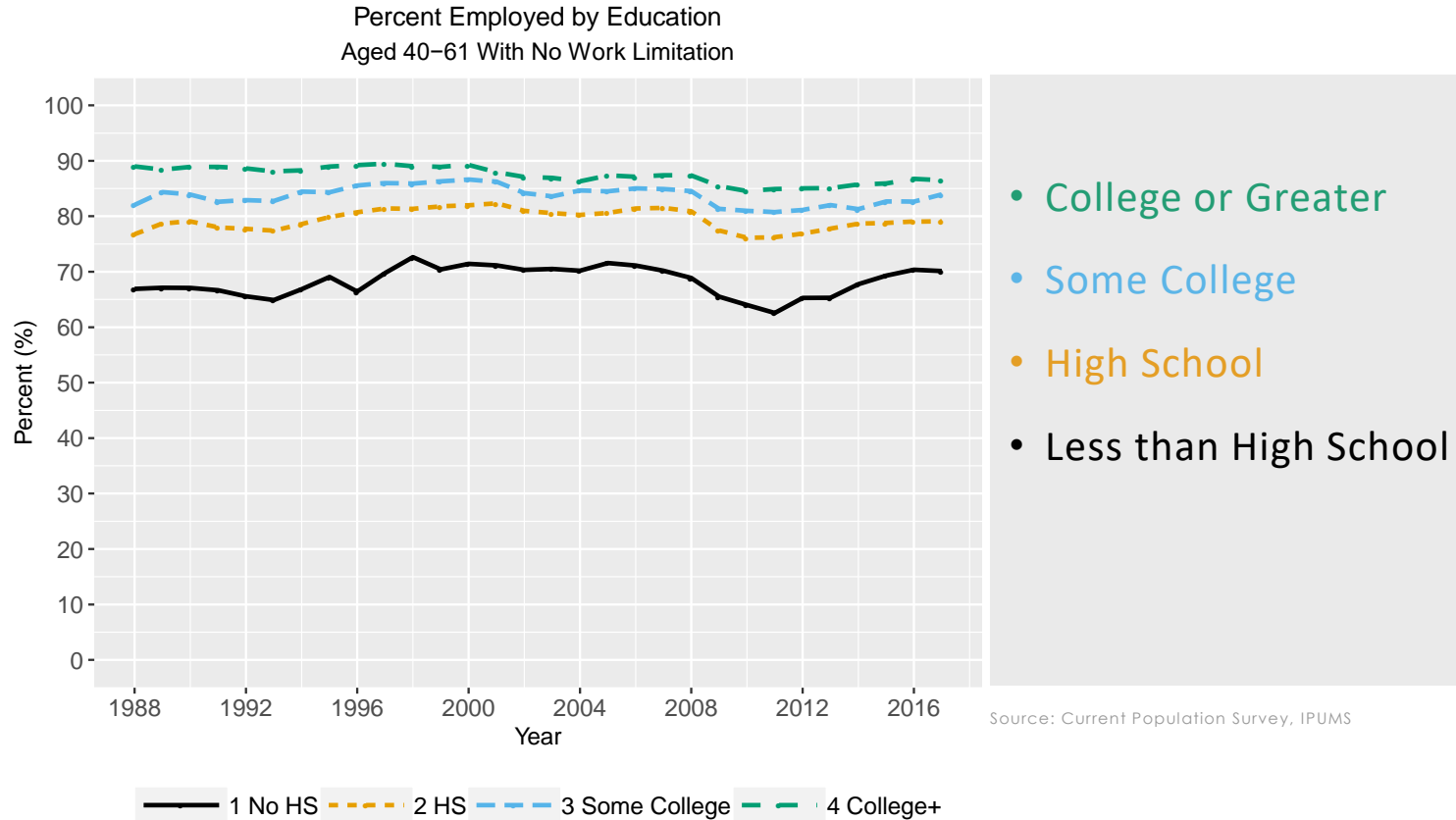


Fraction with some college or greater

- Soc. Sec. beneficiaries: 35%
- **Work-Limited, not employed: 41%**
- **Work-Limited, employed: 57%**
- **Not Work-Limited: 65%**

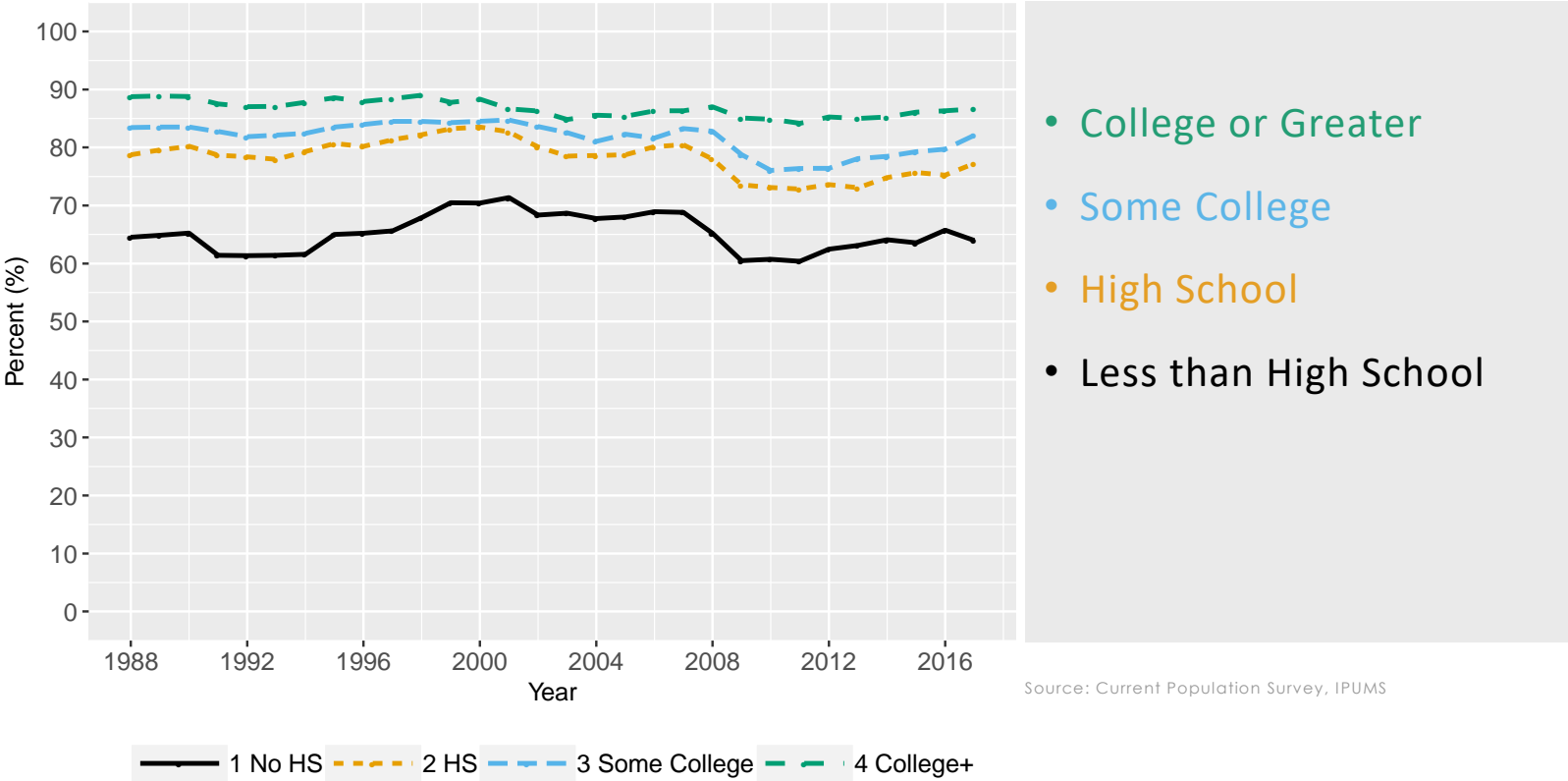
Source: Current Population Survey, IPUMS

Employment Among Adults Without Work Limitations is Higher Among More Educated Adults

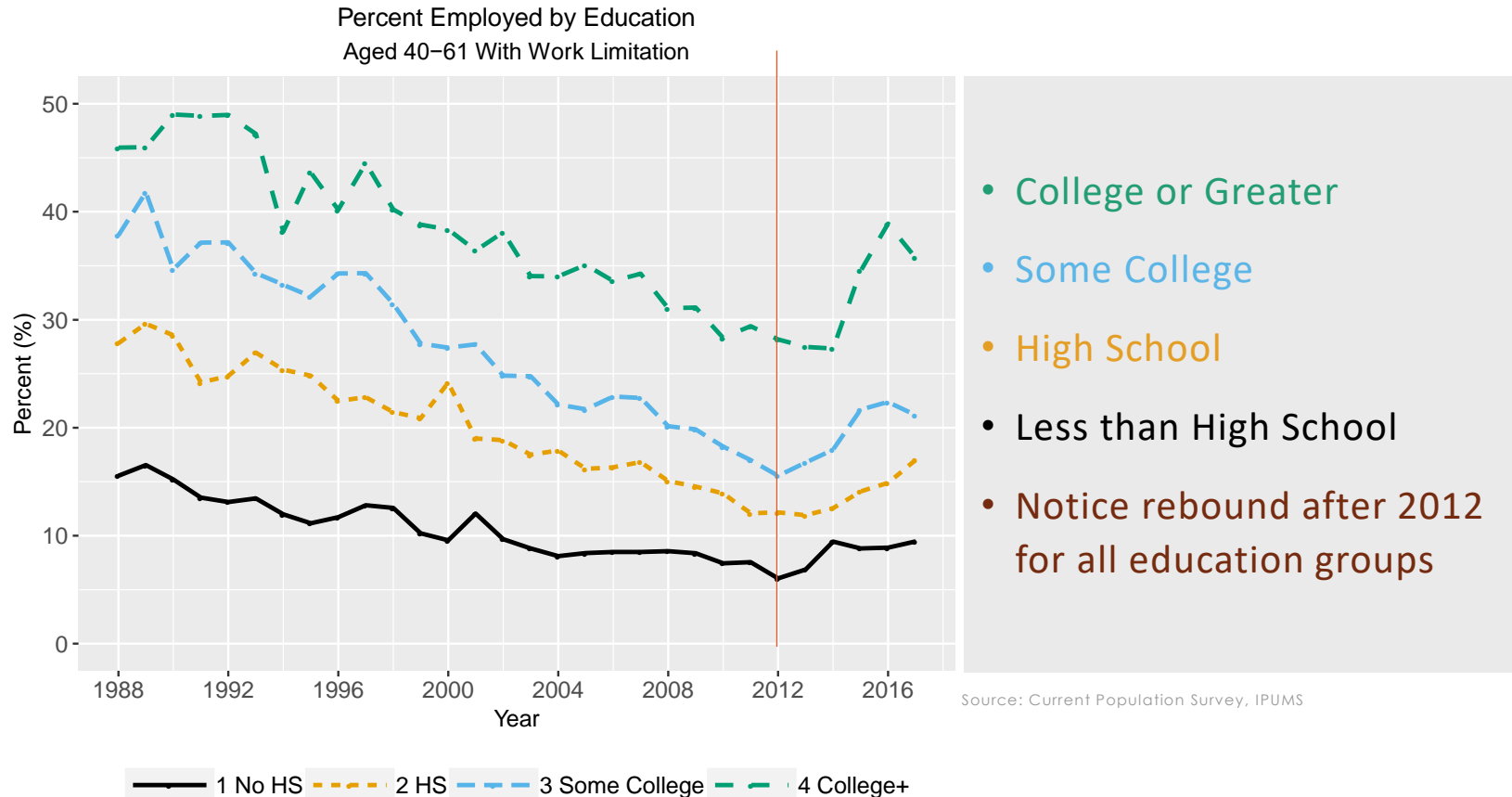


Also True Among Young (25-39) Not Work-Limited Adults

Percent Employed by Education
Aged 25-39 With No Work Limitation



Unhappy Surprise: Employment of Adults with Work-Limitations *Fell* at All Education Levels, 1988 – 2012



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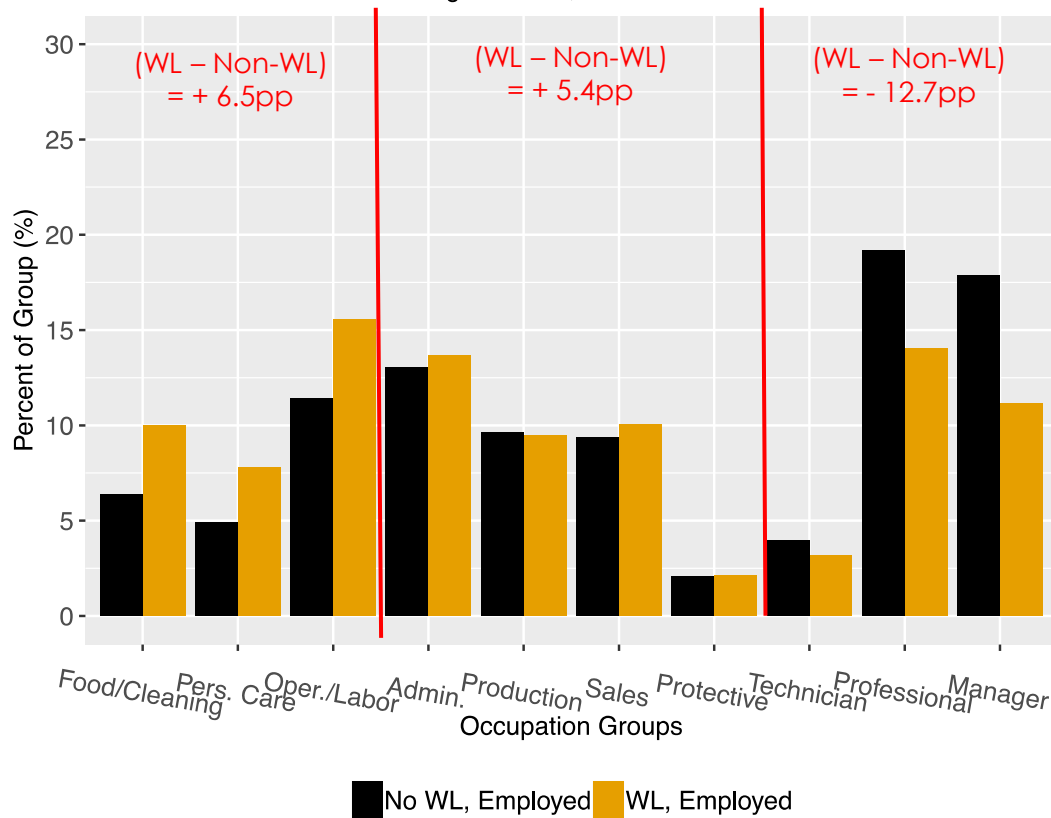
Happily, Adults with Work Limitations Have Comparable Earnings to Non-Limited Workers in Same Occ's



Adults with Work Limitations Overrepresented in Low- and Middle-Income Occupations

Occupation Groups by Work Limitation

Aged 40–61, 2010–2017



Source: Current Population Survey, IPUMS

Adults with Work Limitations Overrepresented in Low- and Middle-Income Occupations

Earnings by Work Limitation

Aged 40–64, 2010–2017

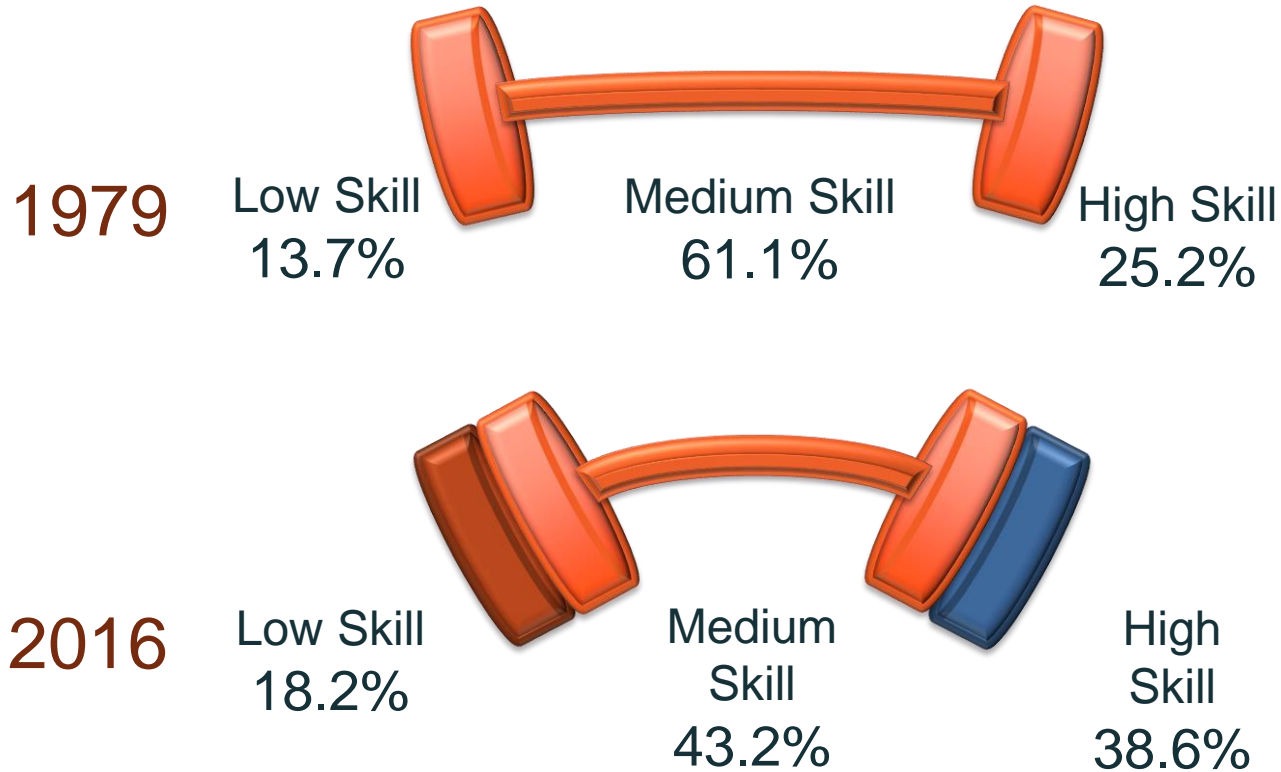


Source: Current Population Survey, IPUMS

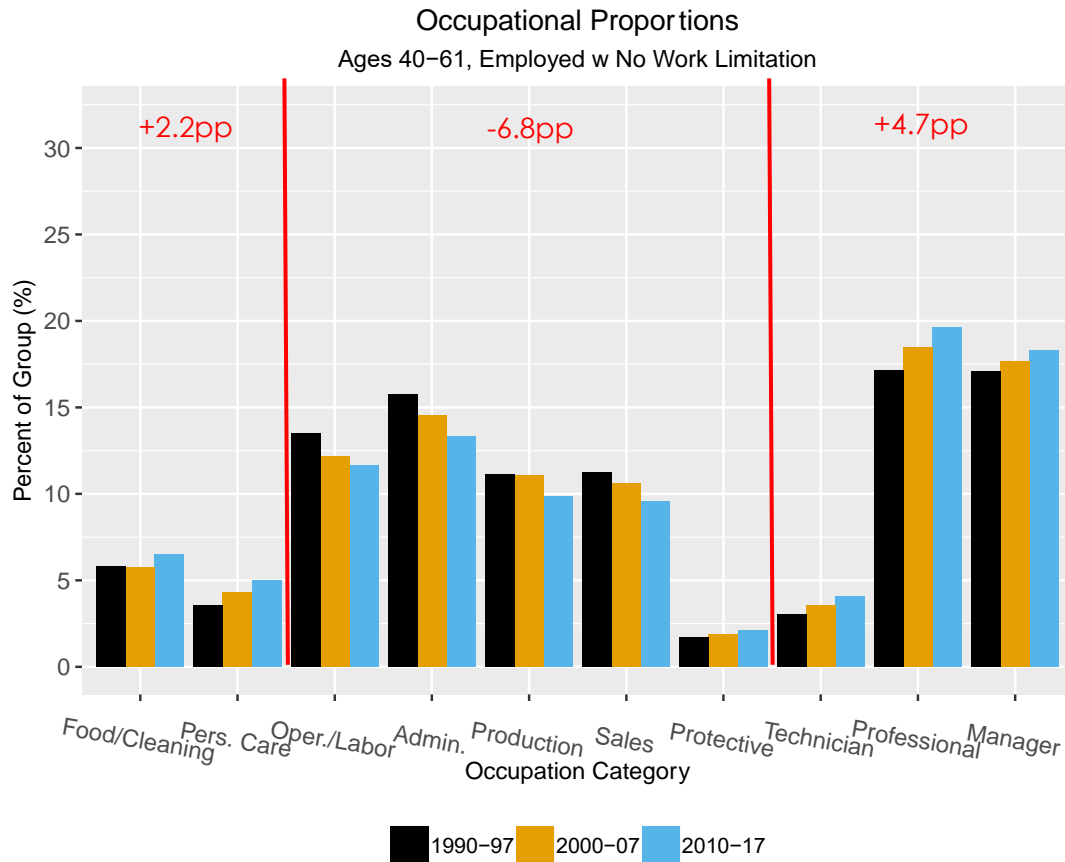
Includes DI/SSI beneficiaries.

Why is this Overrepresentation a Concern?

Job Polarization: The 'Barbell' Labor Market



Employment Has 'Polarized' Among Workers Ages 40 – 61 Without Work Limitations



Source: Current Population Survey, IPUMS

Includes DI/SSI Beneficiaries.

Employment Has Also Polarized Among Adults with Work Limitations: Steep Decline in Middle-Skill/Wage Jobs



Source: Current Population Survey, IPUMS

Includes DI/SSI Beneficiaries.

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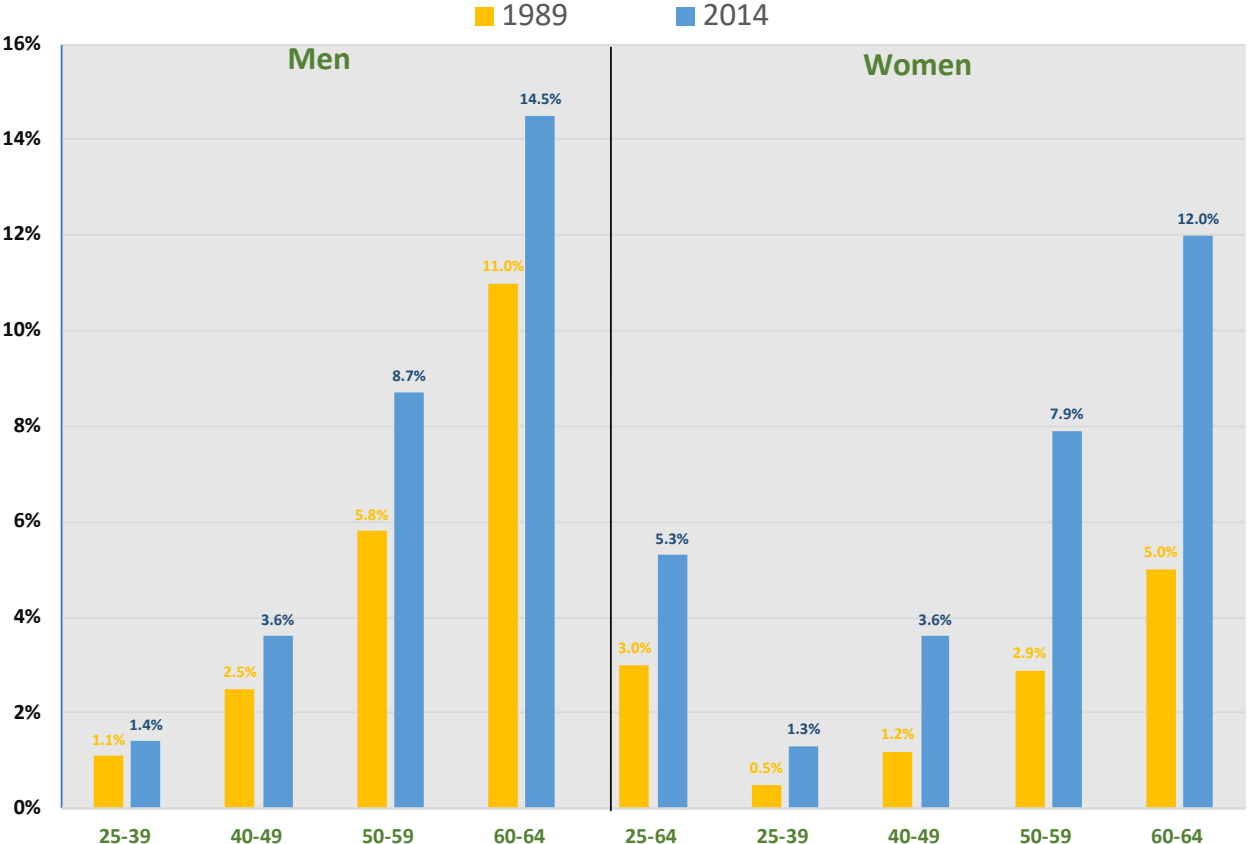
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SSDI Receipt Rose 1989 - 2014 for All Age Groups + Sexes, Largest Jumps Among Ages 50-59, 60-64

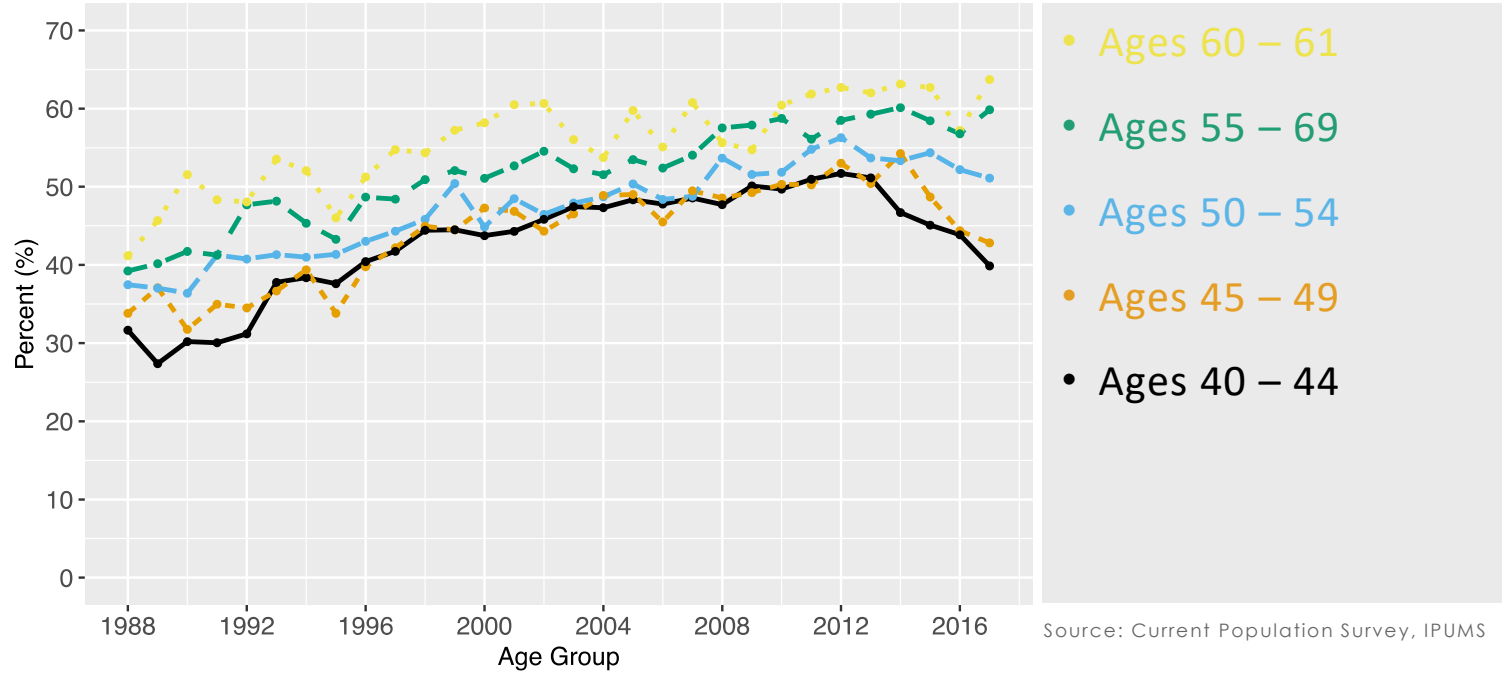
Comparison of SSDI Prevalence by Age and Gender, 1989 and 2014



Source: SSA and CPS/ACS

Rise in SSDI/SSI Receipt Pronounced at All Age Levels Among Work-Limited Adults – then Rebound 2012-Forward

Soc. Security or SSI Among Work Limited, by Age Group
Aged 40-61

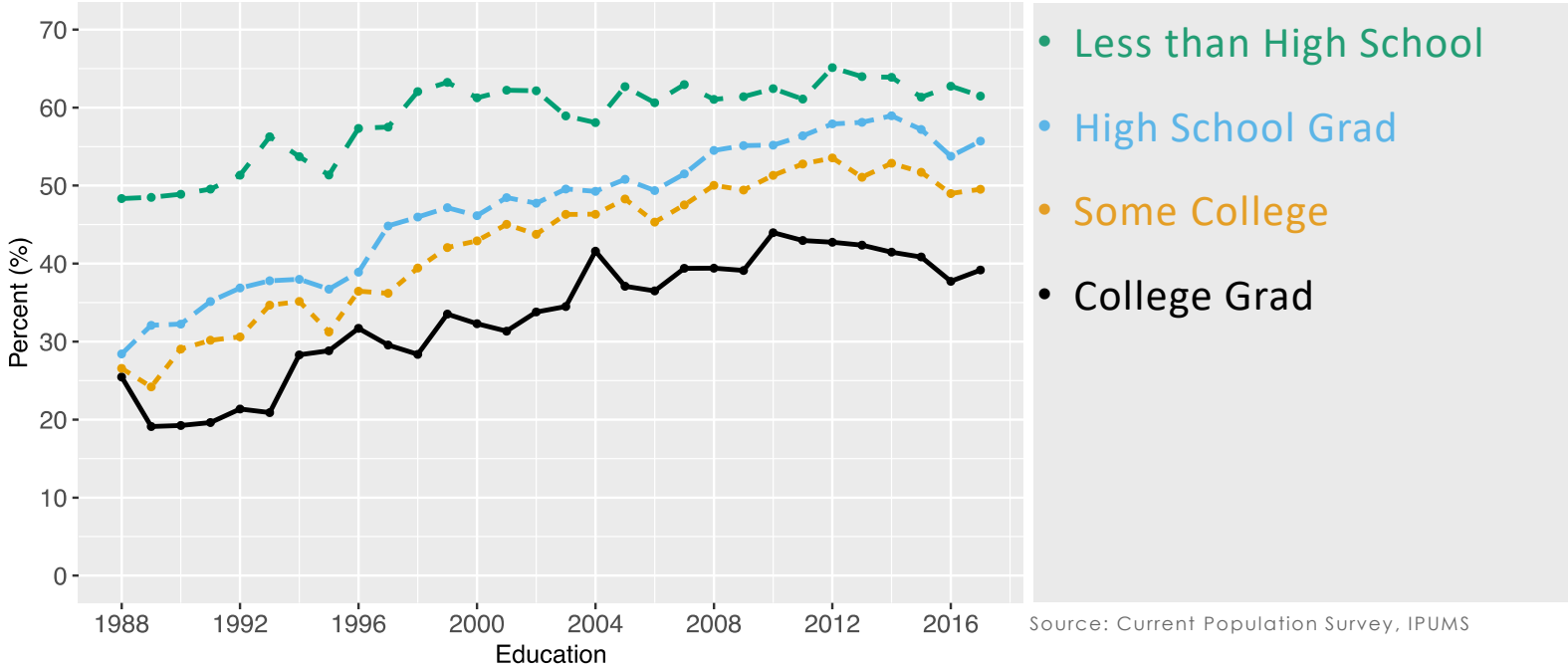


Source: Current Population Survey, IPUMS



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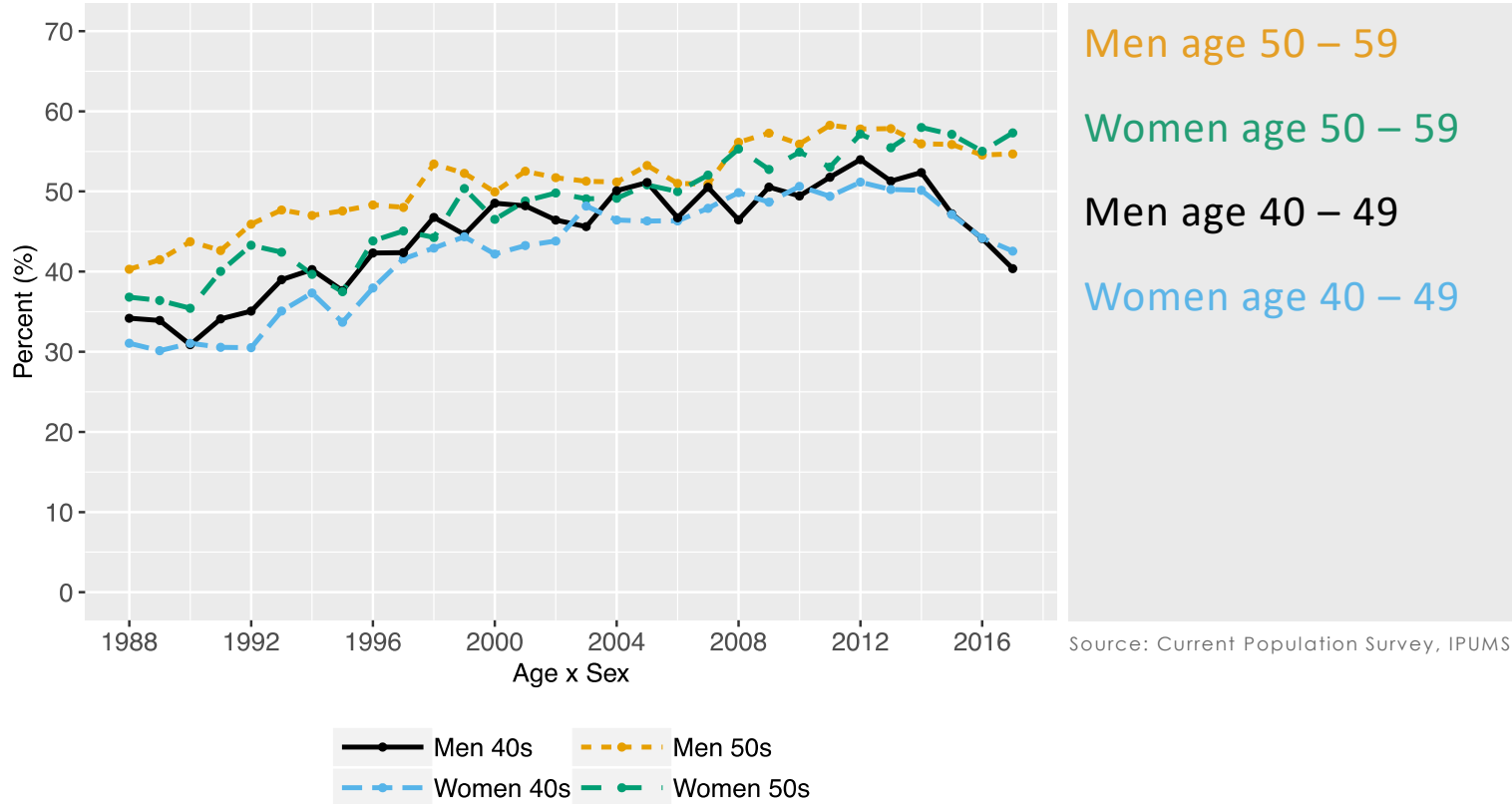


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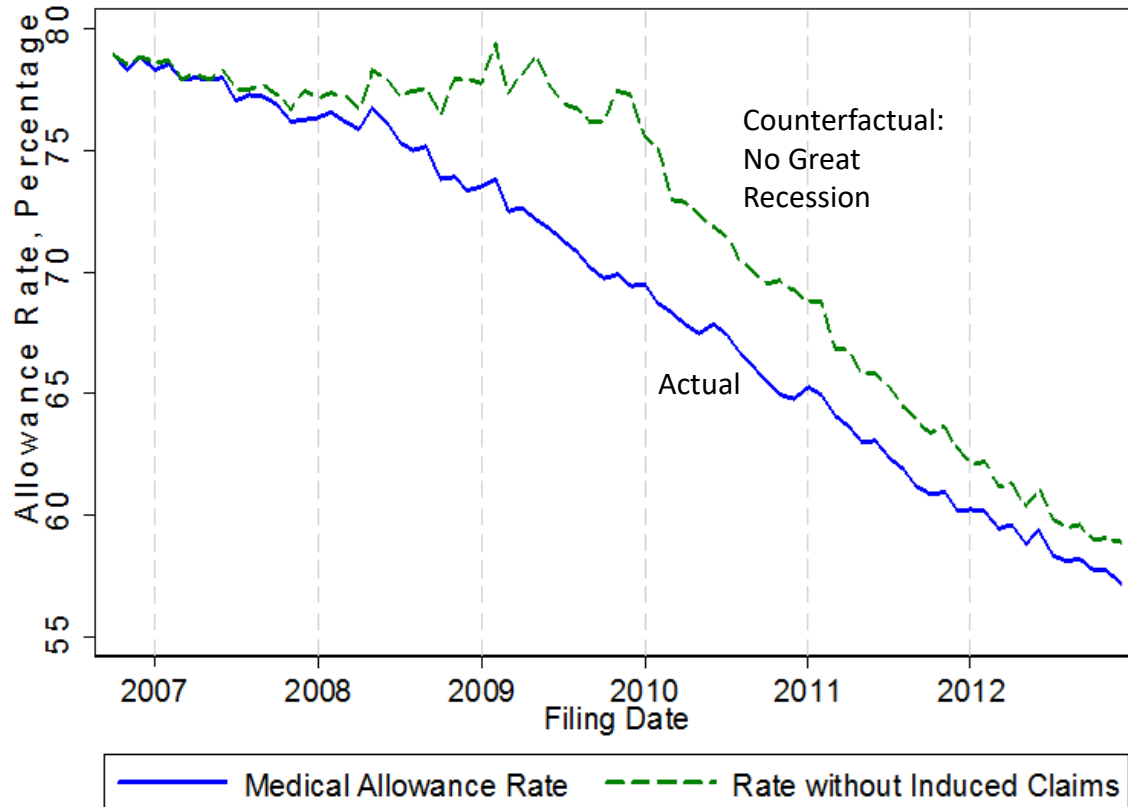


Rise in SSDI/SSI Pronounced Among Both Sexes Among Work-Limited Adults – Then Rebound 2012-Forward

Soc. Security or SSI Among Work Limited, by Age x Sex
Aged 40–61



The Sharp Reduction in Hearing Allowance Rates Slowed Program Inflows, Deterred Applications



Source: Maestas, Mullen and Strand 2018

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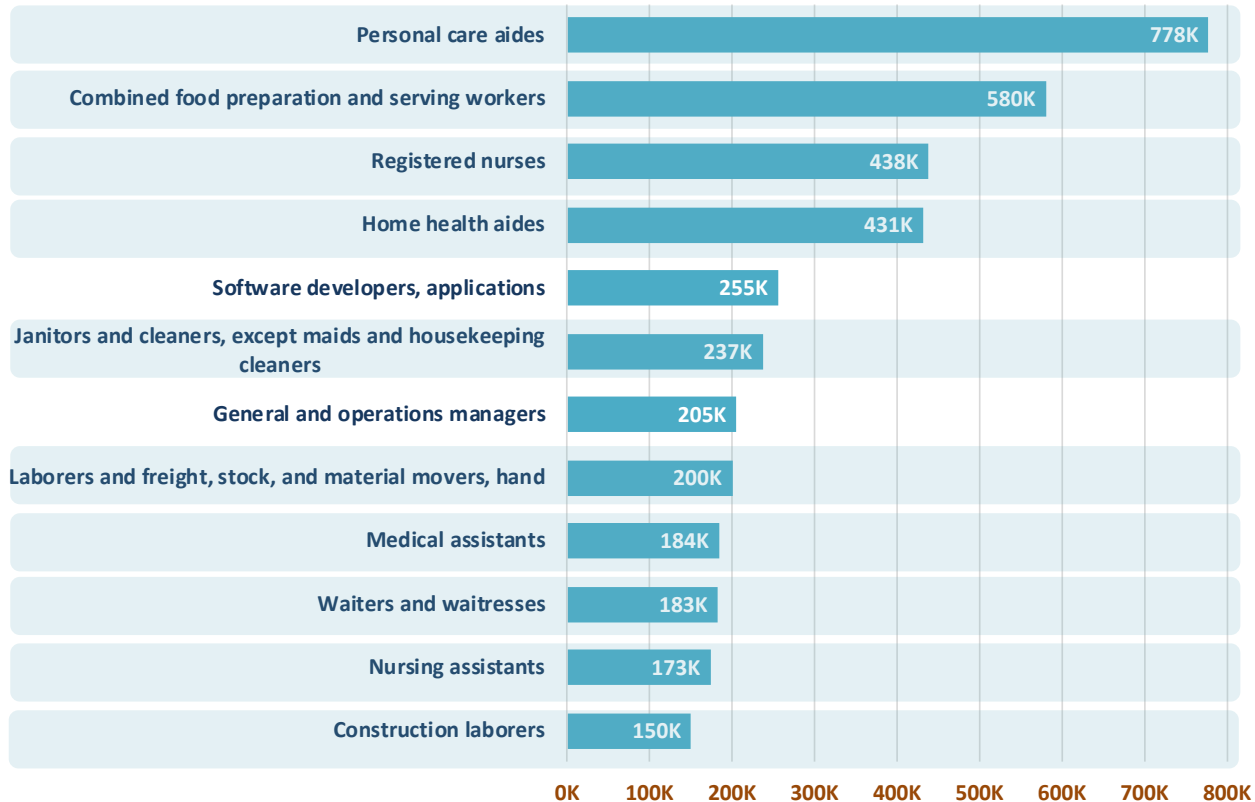
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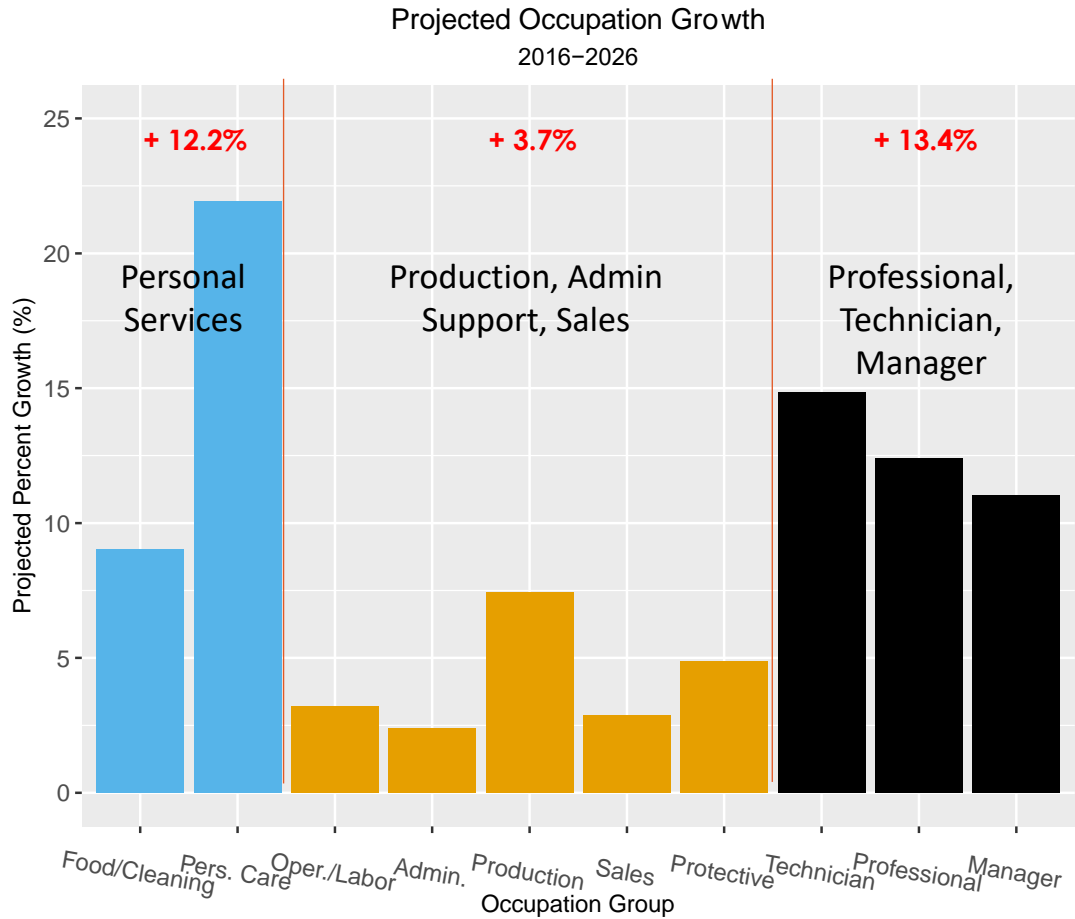
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The Twelve Occupations with Largest Projected Numerical Employment Gains 2016—2026



Occupations with Most Projected Growth Are Personal Services and Prof/Tech/Management Occupations



Source: BLS Occupational Outlook, 2018

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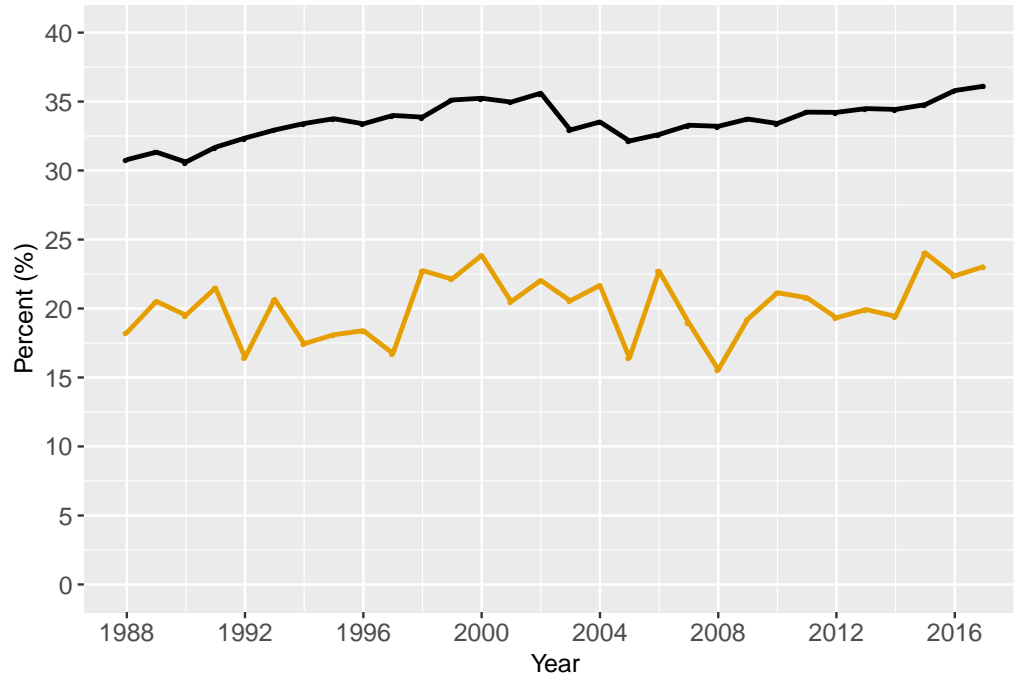
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Fraction of Jobs Requiring College Degree Rising Among Non-Limited, Flat Among Work-Limited

Percent in Occupation Requiring College Degree
Employed Non-Beneficiaries Aged 40-61



Job needs college degree

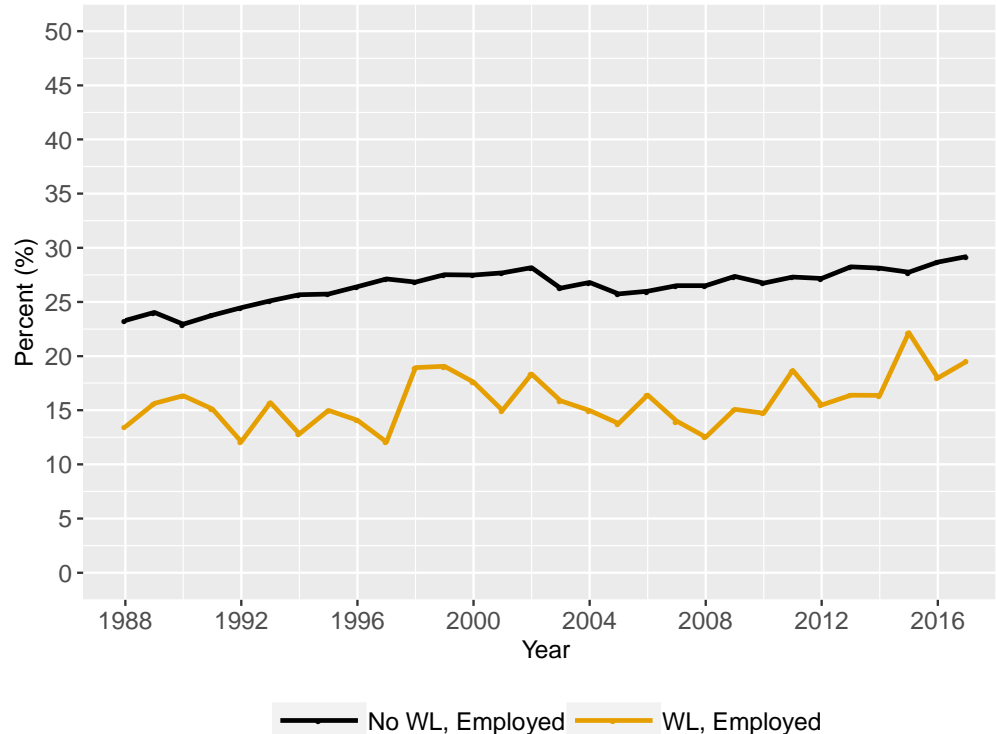
- Not work-limited
- Work-limited

— No WL, Employed — WL, Employed

Sources:
BLS Occupational Requirements Survey
Current Population Survey, IPUMS

Fraction of Jobs w/ Complex Decision-Making Rising Among Non-Limited, Flatter Among Work-Limited

Percent in Occupation Requiring Complex Decisions
Employed Non-Beneficiaries Aged 40-61



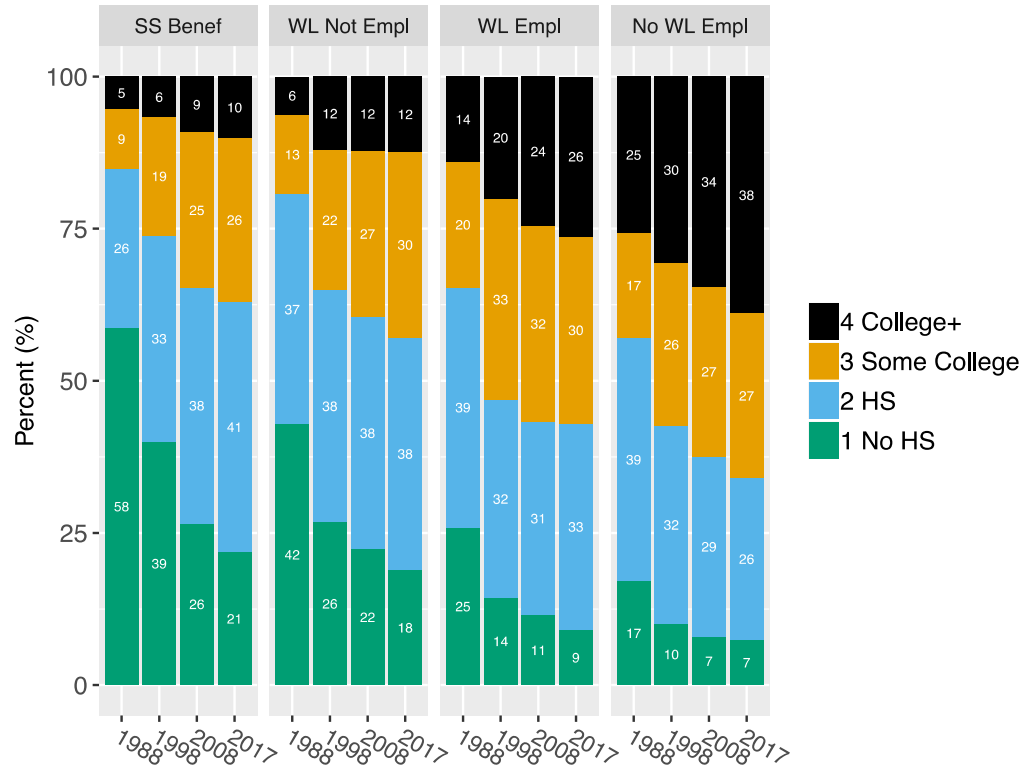
Job needs college degree

- Not work-limited
- Work-limited

Sources:
BLS Occupational Requirements Survey
Current Population Survey, IPUMS

Education Has Risen Among All Worker Groups, but Remains Much Lower Among Adults with Work Limitations

Educational Shares by Category
Aged 40–61



Rise in college-share

- 5 pts: SS Beneficiaries
- 6 pts: Work-limited, not Working
- 12 pts: Work-limited, Working
- 13 pts: Not Work-Limited

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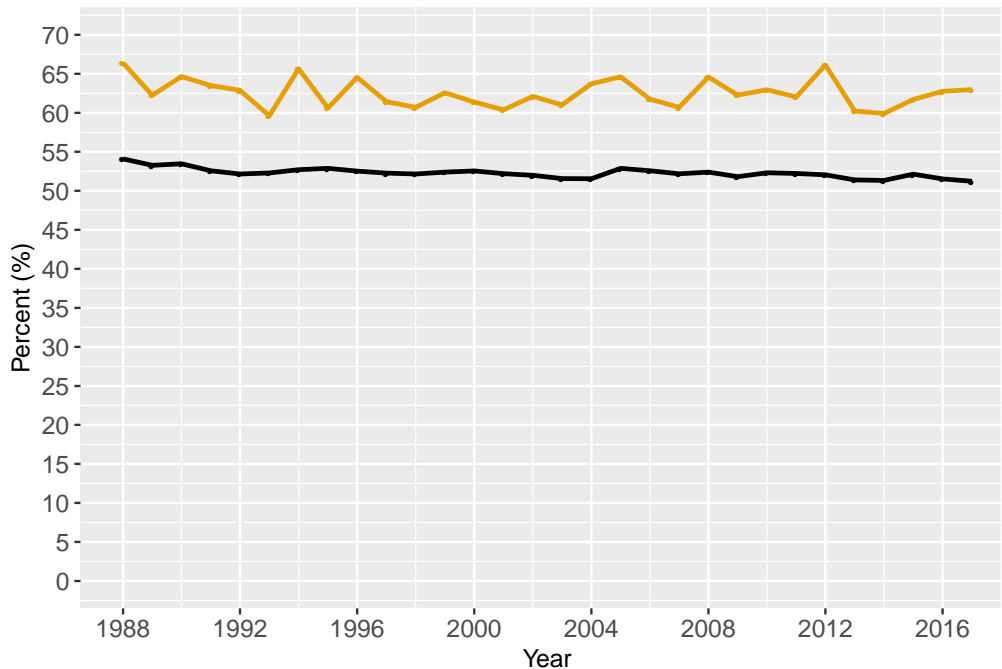
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Ironically, Jobs Held by Adults with Work-Limitations are Disproportionately Likely to Require Standing

Percent in Occupation Standing > 50% of Workday
Employed Non-Beneficiaries Aged 40-61



Standing >50% of workday

- Work-limited
- Not work-limited

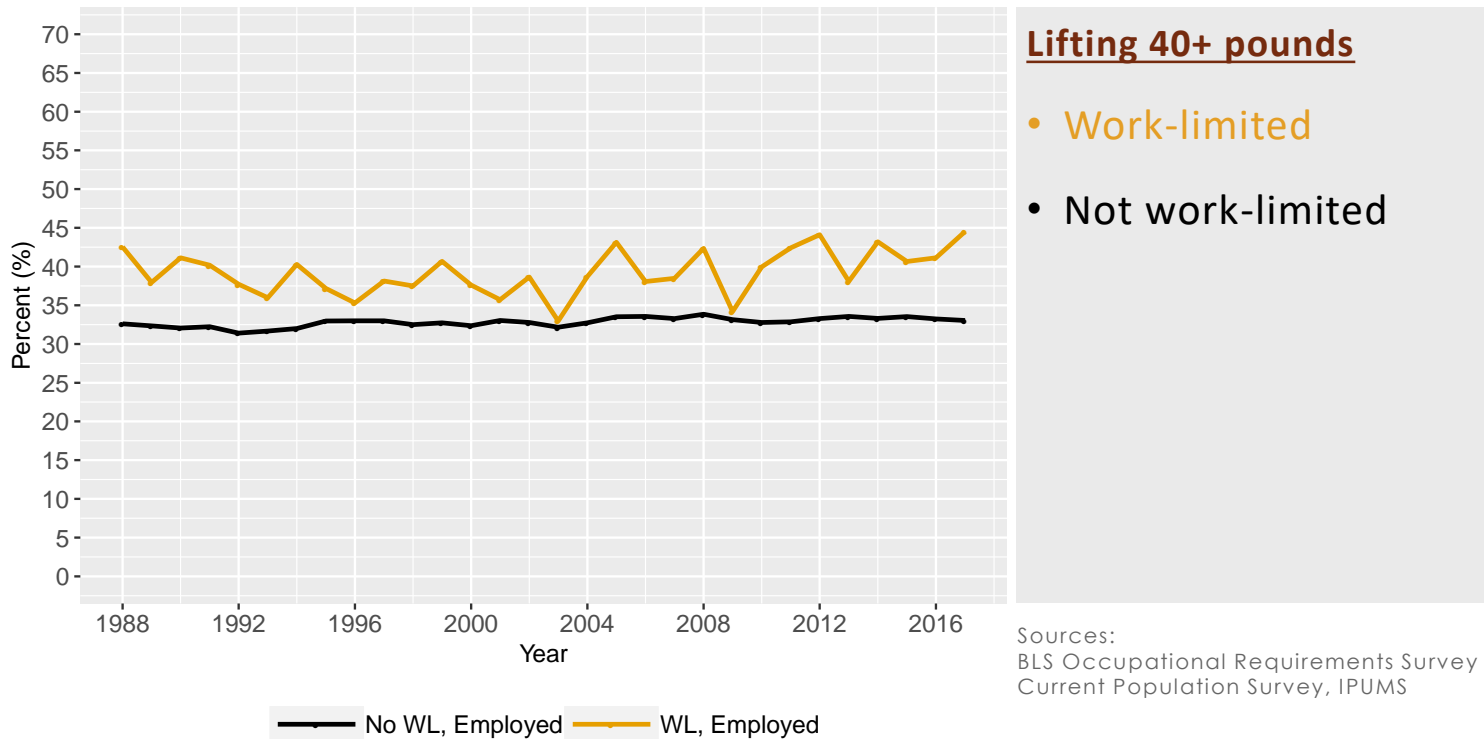
— No WL, Employed — WL, Employed

Includes DI/SSI Beneficiaries.

Sources:
BLS Occupational Requirements Survey
Current Population Survey, IPUMS

Ironically, Jobs Held by Adults with Work-Limitations are Disproportionately Likely to Require Lifting

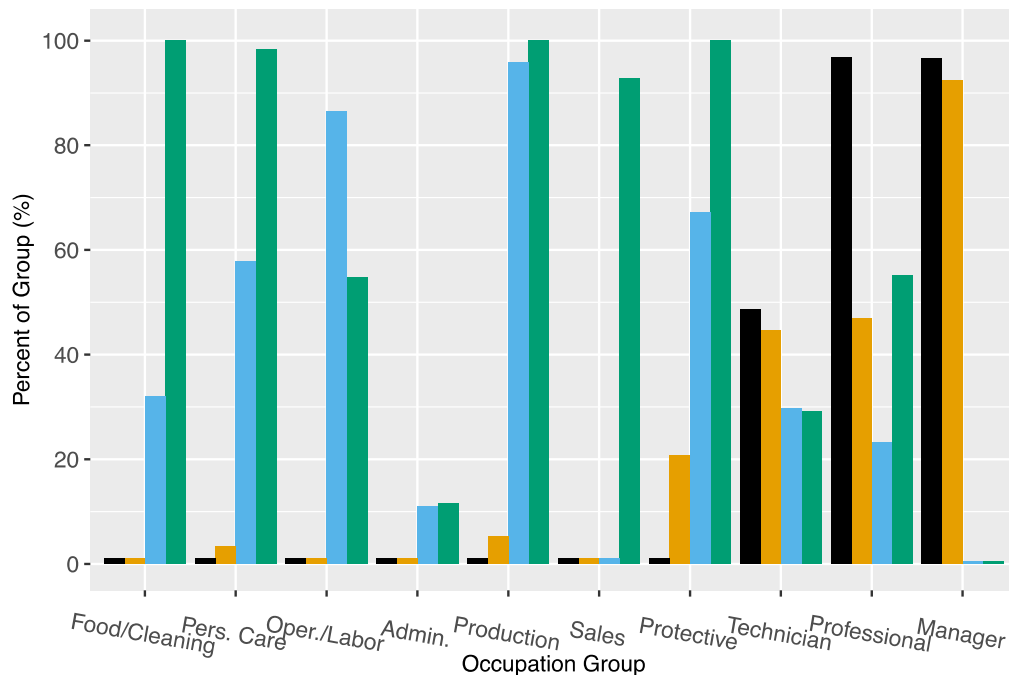
Percent in Occupation Lifting 40+ Pounds
Employed Non-Beneficiaries Aged 40-61



Includes DI/SSI Beneficiaries.

Adults with Work Limitations Concentrated in Standing/ Lifting Jobs—Which Are Projected to Grow

Tasks of Occupation Groups
Aged 40–61, 2010–2017



- Standing >50% of day
- Lifting 40+ pounds
- Complex decision-making
- College degree

Source:
BLS Occupational Requirements Survey

College Degree Complex Decisions Lifting Standing

Includes DI/SSI beneficiaries.

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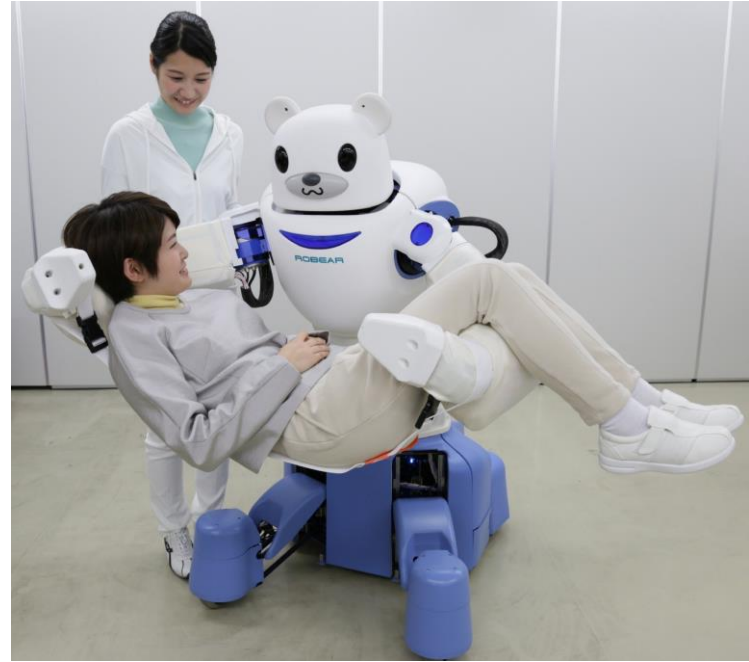
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Not All Robots are Engineered to Replace Workers



Phoenix Exoskeleton by SuitX



RIBA II Care Robot by RIKEN

Assistive technologies will improve dramatically but remain expensive. And SSI/SSDI cannot assist workers (paradox)

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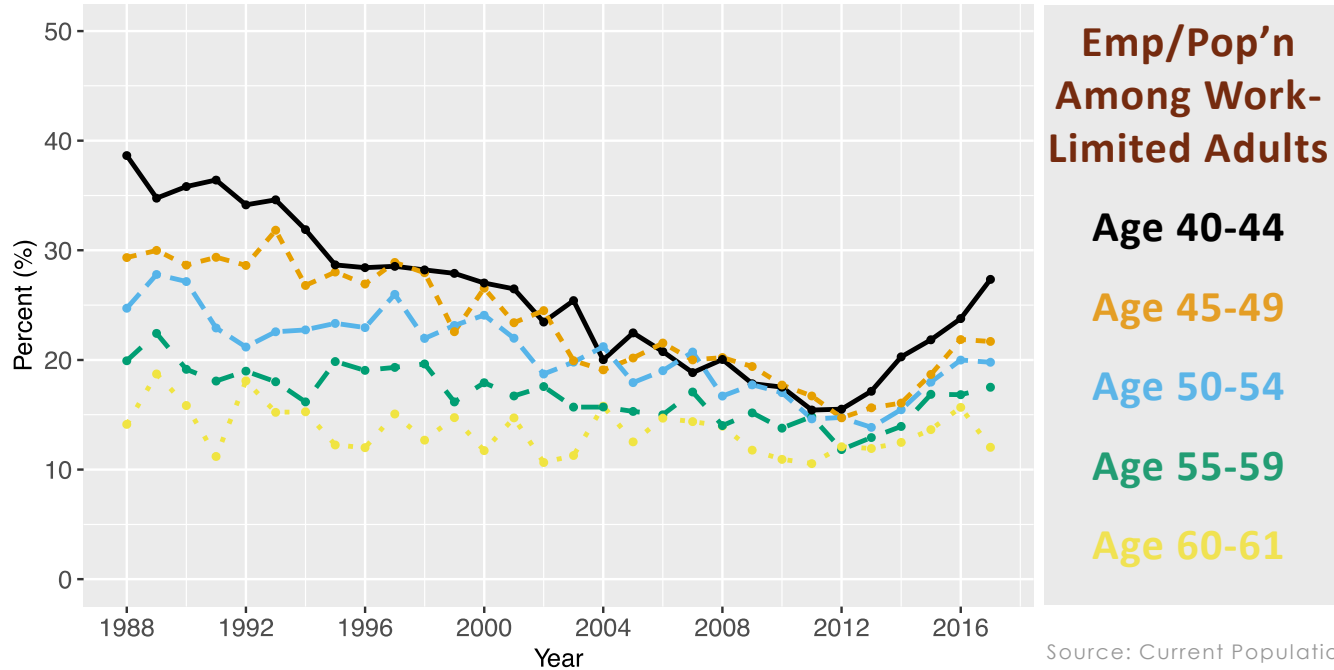
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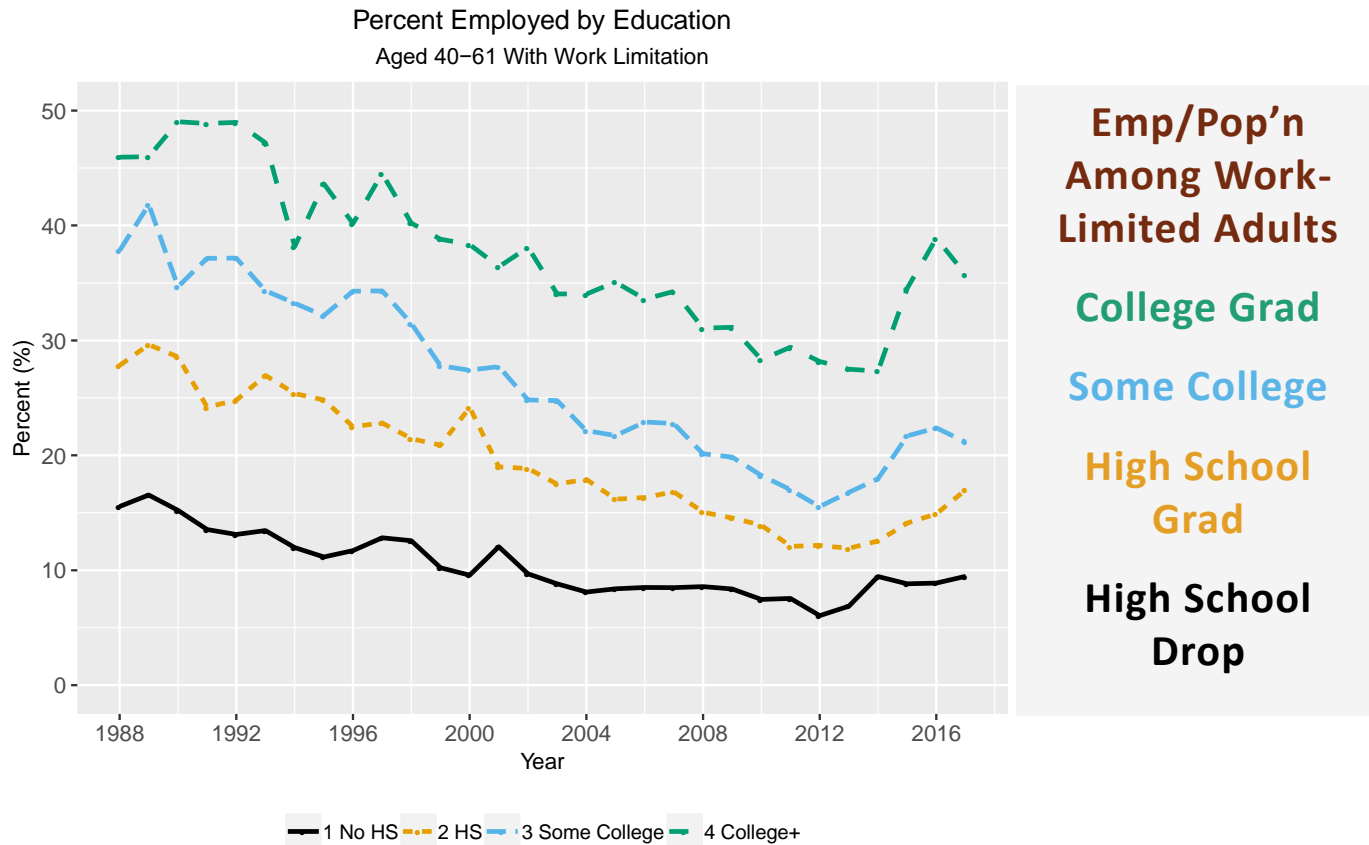
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Revisiting the Medical-Vocational Grid: Age is Much Less Relevant than It Used to Be

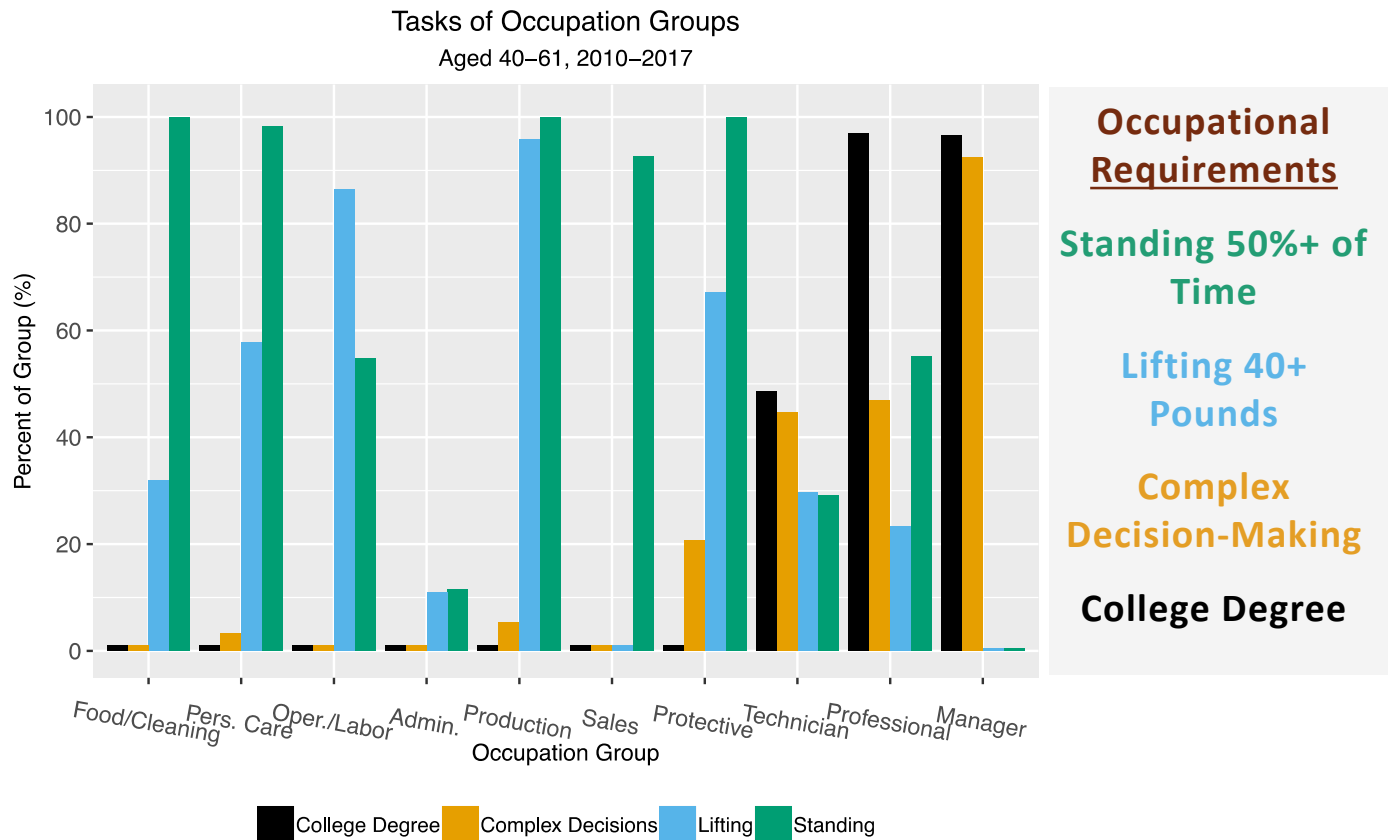
Percent Employed by Age
Aged 40–61 With Work Limitation



Revisiting the Medical-Vocational Grid: Education Remains Quite Important



Challenge for Adults w/Work Limitations in Future Jobs: Most Require Either College Degree or Physical Labor



Includes DI/SSI beneficiaries.

Source:
BLS Occupational Requirements Survey

Implications for the Medical-Vocational Grid

1. Age is much less relevant for employment of work-limited adults than it used to be
 - Related to less strenuous jobs?
2. Physical tasks (e.g. standing) remain important
 - Assistive technologies will greatly improve
 - But SSA is not designed to provide these support
 - Can the Americans with Disabilities Act help?
 - *Automation will not reverse this pattern soon*
3. Four-year college education increasingly critical to non-physically-task-intensive jobs
 - Growth of professional, technical, managerial jobs
 - *Automation will not reverse this pattern soon*

Conclusions: Challenges and Opportunities for Workers with Disabilities in the 'Robot-ificial' Intelligence Era

- **Employment of adults with work limitations collapsed 1992 – 2011 —*then* rebounded since 2012. What caused the collapse *and* rebound?**
 1. Occupational change
 2. Labor market tightness
 3. SSA policy
 - You can order these as you prefer
- **The key employment challenges going forward...**
 1. Rising demand for workers with college degree
 2. Rising demand for non-college low-paid, physically demanding jobs
- **Future of work for work-limited adults...**
 - Opportunity: Assistive technologies will be amazingly good
 - Challenge: But Social Security disability programs not designed to assist adults to remain in the labor force