

# How Often Do the Requirements of Jobs Change?

## Office of Compensation and Working Conditions

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# Outline

- Background on Occupational Requirements Survey
- Why is this a pressing issue?
- On-going research
  - ▶ Census/ACS
  - ▶ O\*NET
  - ▶ Regression Trees
- Questions for Discussants



# Occupational Requirements Survey

## ■ Primary Purpose

- ▶ Social Security Administration's Disability adjudication process
  - Steps 4 and 5
- ▶ Potential input into Occupational Information System
- ▶ Collects the elements SSA requires
- ▶ Produce estimates at the 8 digit O\*NET SOC level



# Occupational Requirements Survey

- [www.bls.gov/ors](http://www.bls.gov/ors)
- Elements (roughly 70)
  - ▶ Specific Vocational Preparation
    - Education, training, experience
  - ▶ Mental and Cognitive Demands
  - ▶ Environmental Condition
  - ▶ Physical Demands



# Occupational Requirements Survey

## ■ Collection

### ▶ National Compensation Survey

- QCEW frame
- Industry based sample with probability selection of occupations
- Data collected by Field Economists

## ■ Current Approach to Creating SOC-level Estimates

- ▶ Collection over roughly 3 years
- ▶ Subset of jobs from over 20,000 establishments



# Why Do We Care How Often Job Requirements Change?

- Dictates how many years of sample are used to create estimates
- May affect approach to sampling
  - ▶ Do different jobs change at different rates?
- May affect approach to collection
  - ▶ Do some elements change more often than others?
- SSA needs to know this to estimate long run costs

# Our Approach to Date

- Identify microdata sets that have information at the 6- or 8-digit SOC level
  - ▶ Census/ACS
  - ▶ O\*NET
- Find indicators of changes in job-related data elements
  - ▶ Education and Age for Census
  - ▶ Subset of O\*NET elements

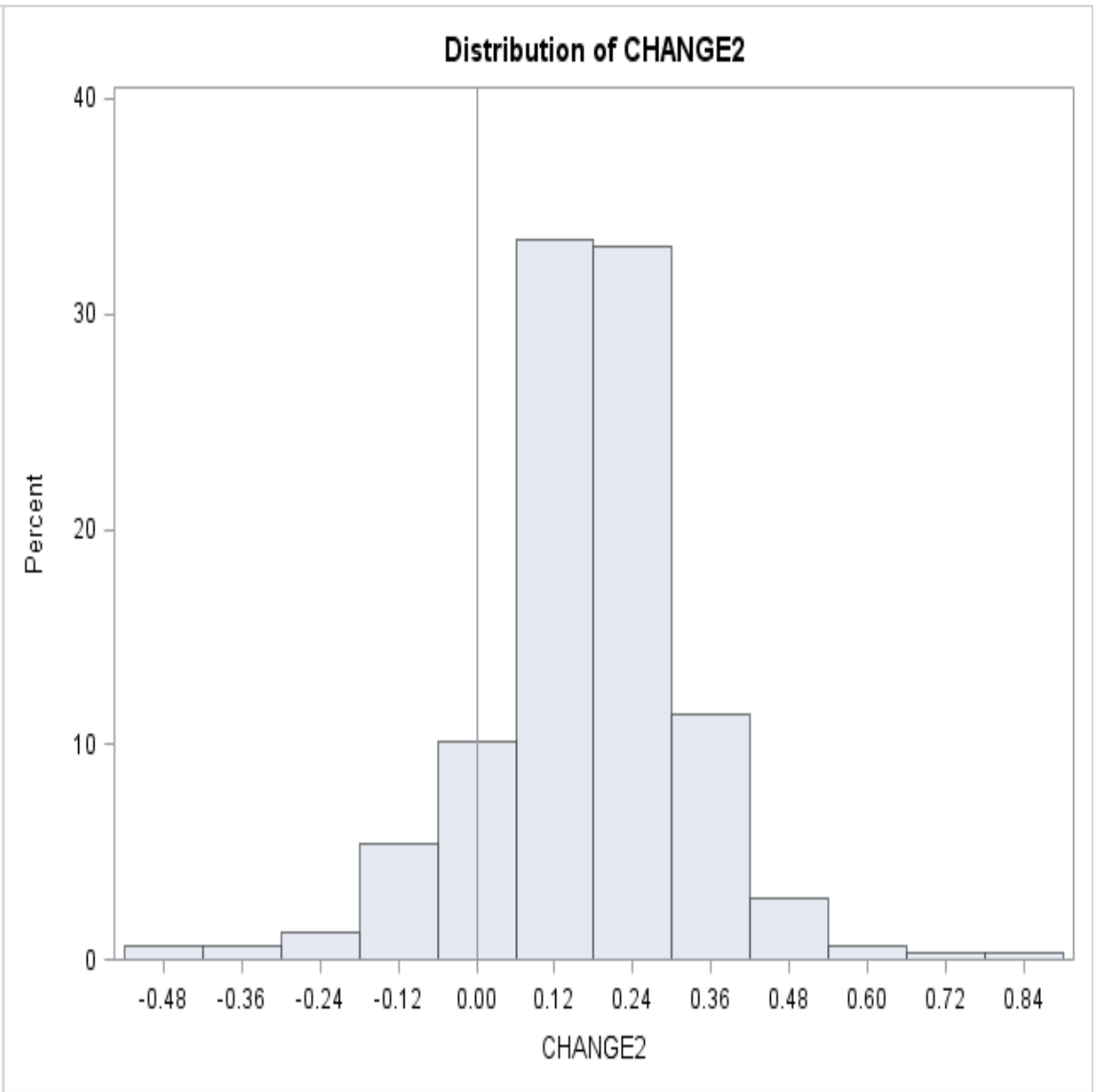
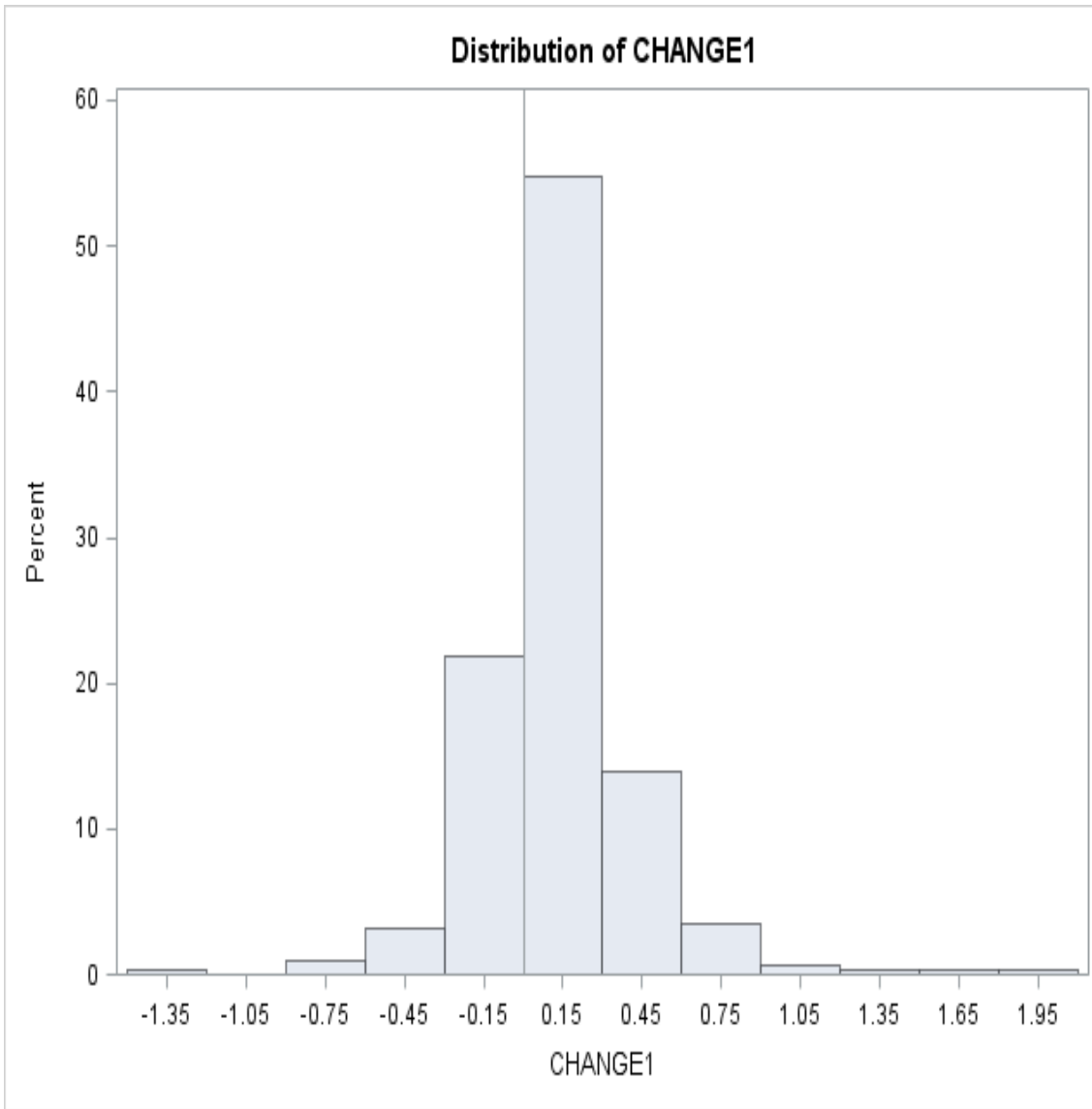


# Using Census/ACS

## ■ Census/ACS

- ▶ Look at changes in education and age over 1990-2010 by 6 digit SOC
  - Crosswalked to 2010 SOC
- ▶ Look for occupations where education change was more than the national average
  - Change from 1990-2000 and from 2000-2010



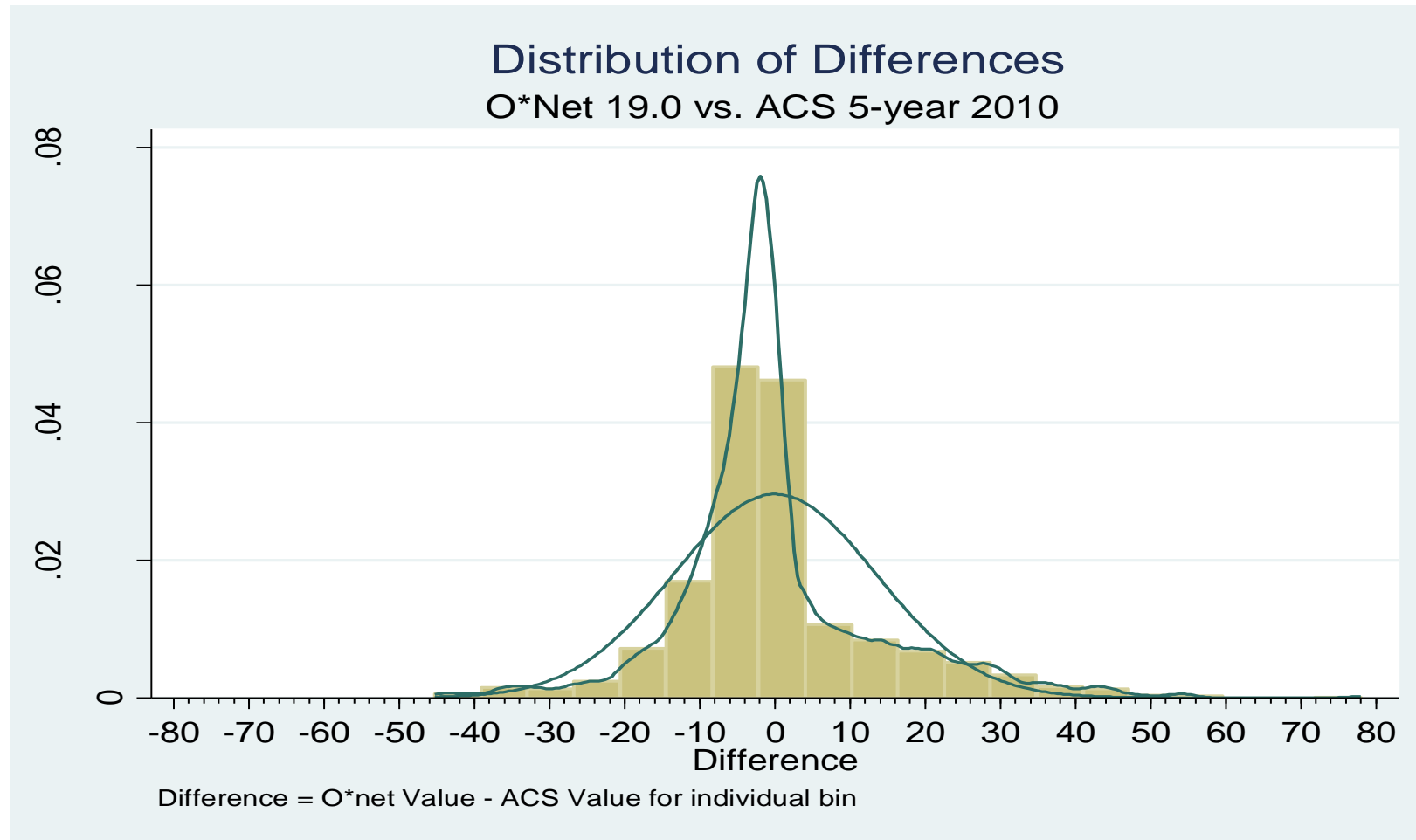


# ACS - General Findings

- Relatively complex jobs had above average education gains in both periods
  - ▶ CEOs, medical scientists, teachers, accountants, auditors
- Relatively simple jobs experienced decreases in average education levels
  - ▶ Data entry keyers, waiters/waitresses, insulation workers, cashiers, sewing machine operators
- Suggests that low-skills jobs might be updated less often



# ACS Caveat – Education Attained vs. Required



# Using O\*NET

## ■ O\*NET context

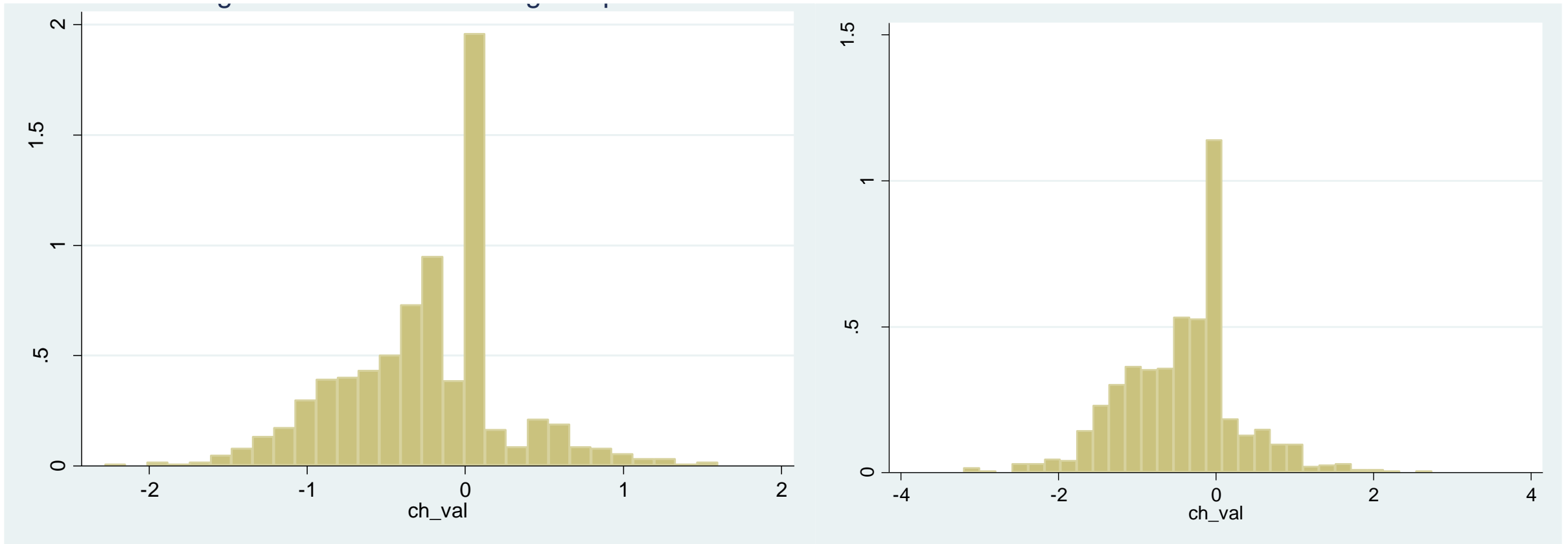
- ▶ Update approximately 100 occupations a year
- ▶ Most SOC's have been updated at least once since O\*NET collected
- ▶ No measure of reliability of early estimates

## ■ O\*NET changes

- ▶ Strength
- ▶ Cognitive elements

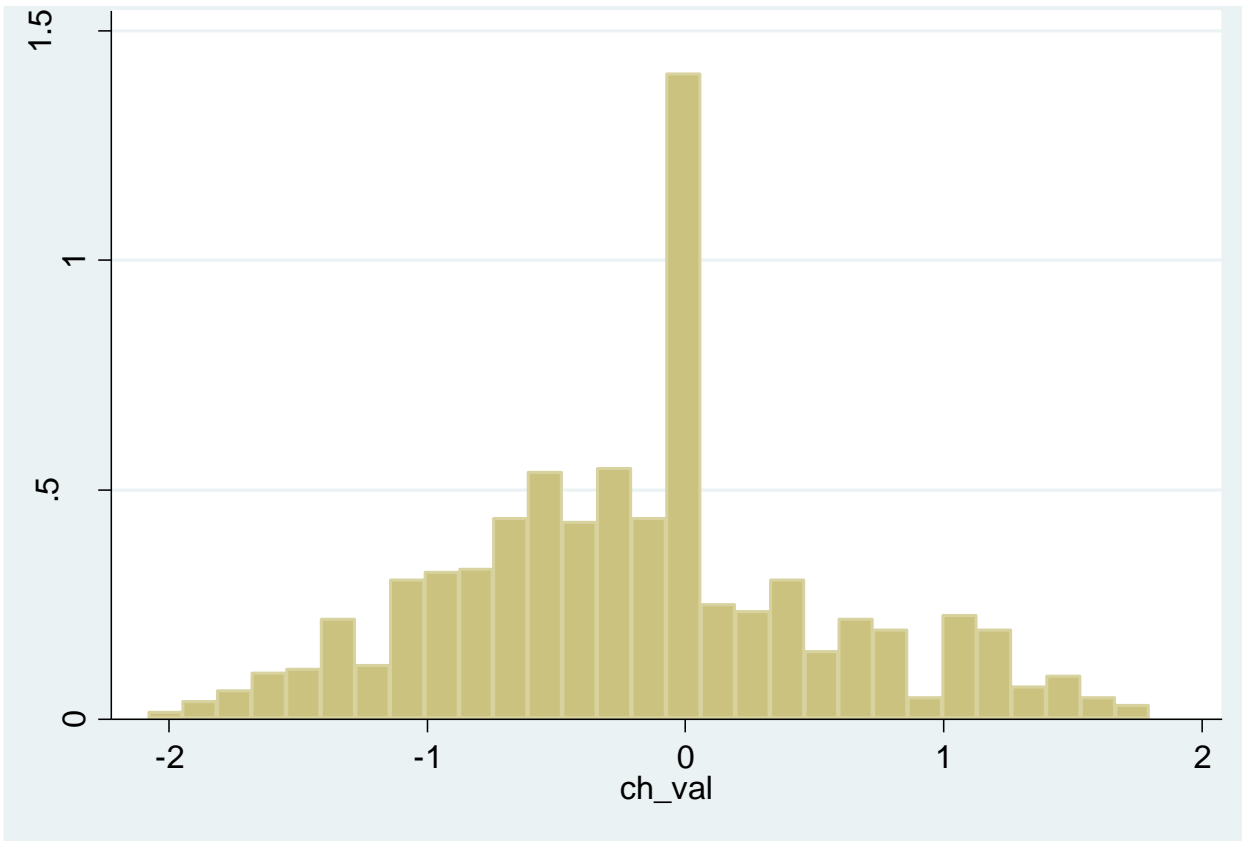
# Change in Static Strength

Importance Level

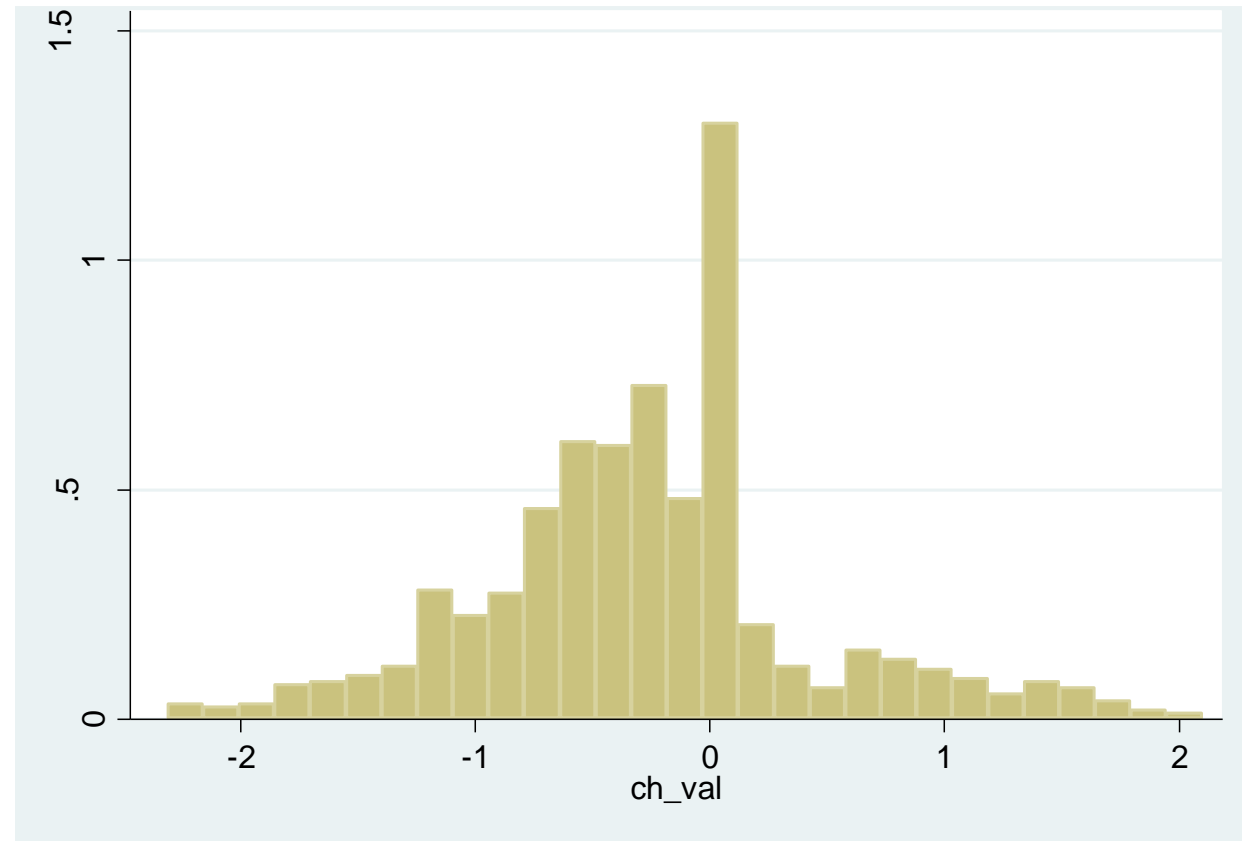


# Change in Cognitive Elements

## Deductive Reasoning



## Oral Comprehension



# O\*NET – Changes by Occupation Groups

- Change in element as a function of 2-digit SOC
  - ▶ Many of the findings are seemingly contradictory
  - ▶ Deductive reasoning decreased in...
    - Arts, design, entertainment, sports, media
    - Food prep and serving
    - Personal care and service occupations
    - Office and admin support
  - ▶ Inductive reasoning increased in...
    - Building and grounds cleaning and maintenance
    - Office and admin support



# O\*NET – Changes by Occupation Groups

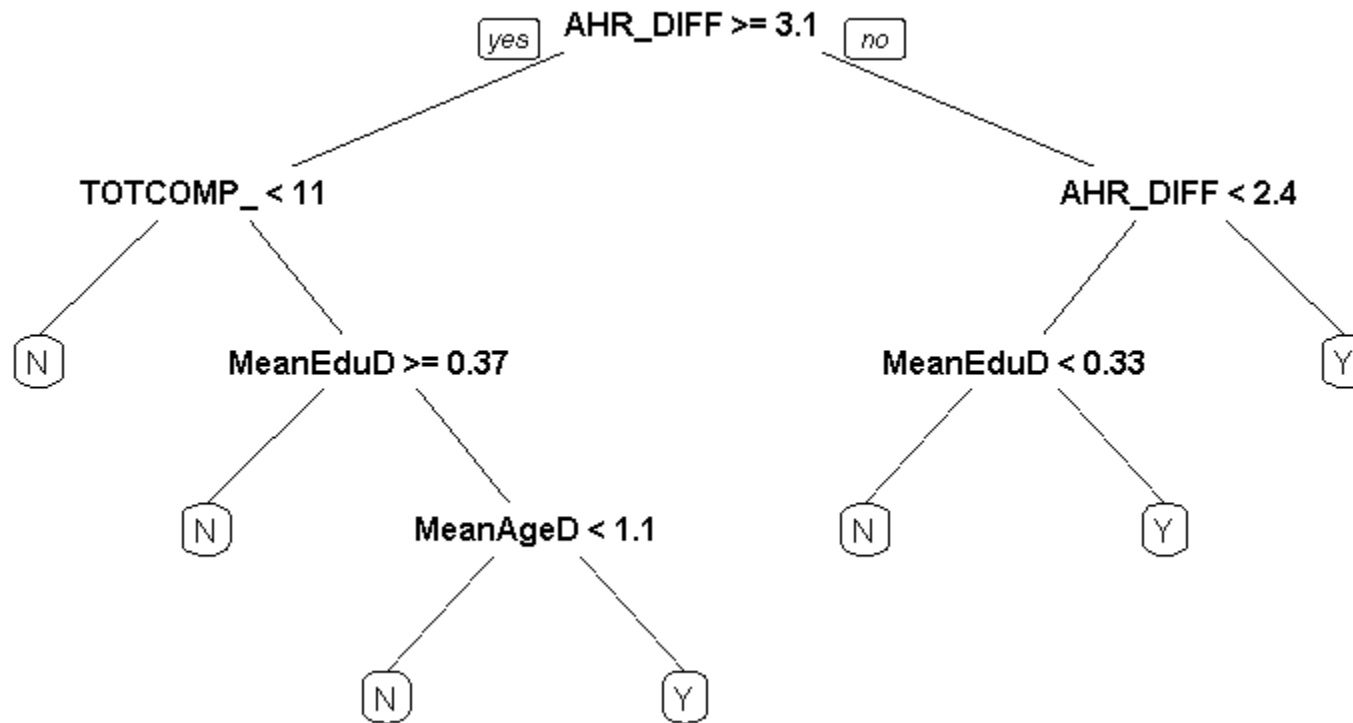
- ▶ Static strength increased in...
  - Building and grounds maintenance and cleaning
  - Production occupations
  
- ▶ Stamina decreased in...
  - Healthcare support
  - Professional services
  - Building and grounds maintenance and cleaning
  - Personal care and services



# Using the National Compensation Survey

- Data on wages/salaries and total compensation
- Also has information on leveling
  - ▶ <http://www.bls.gov/ncs/ocs/sp/ncbr0004.pdf>
- Due to limited sample size, look at the 2-digit SOC level
  - ▶ Can combine changes in wages, compensation and/or level at the 2 digit level with ACS changes to develop regression trees for changes.

# How Can We Pull This All Together?



# Other BLS-sponsored Research on-going

Michael Handel

- European Working Conditions Survey (1990-2015)
- International Social Survey Program (1989, 1997, 2005)
- Quality of Employment Surveys (1969, 1972/73, 1977)
- Panel Study of Income Dynamics (1976, 1985)
- Trends in economy-wide DOT and O\*NET skill scores reflecting changing occupational shares (1960-2010)
- Growth rates of broad occupations from U.S. Census/CPS and other OECD labor force surveys since 1990



# Tentative Conclusions

- Job requirements generally do not change very rapidly, but there are exceptions
- Certain jobs appear to change more frequently than others
  - ▶ Skill level and technology likely play a role in this
- Certain job elements likely change more frequently than others
  - ▶ In O\*NET the cognitive elements change more (in relative levels) than the strength elements, within 2-digit SOC groups



# How Complicated Should We Make This?

- Practical Issues (sampling and data collection)
  - ▶ Updating certain jobs more frequently than others may be easier to administer than updating certain elements at different frequencies
  - ▶ Eventually, every job is going to need to be updated with some regularity



# Questions

- Are there other data sets well-suited to understanding how the requirements of jobs have changed over time (keeping in mind that we would like to be able to assess this at a relatively detailed occupational level)?
- Other than looking at past changes, are there other approaches one could take to considering how jobs may change in the future?



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