# M:0.R.E. Major, Occupation, Regional COLI & Earning An Application for Career Path Exploration

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#### **Introduction**

Career options and earnings potential are important factors for students choosing a college major. However, many students have limited and inaccurate understanding of the career landscape. Moreover, career outcomes data are scattered and hard to use. With better information, students would be able to mitigate unwanted major-job mismatch and regret.

#### M.O.R.E's Approach

What: M.O.R.E. is an interactive career and college major exploration and recommendation application.

**How:** The application enables user to obtain information via interactive visualizations that connect college major, occupation and earning distribution. Our application is helpful for both users with little prior information and those who have targeted selection(s) in mind.

- Enter/search major or occupation using select box
- Display similar majors or occupations to entered value in select box
- Display all majors that lead to a career selection
- Display all occupations that a selected major may lead to
- Earning and percentile histogram
- Earning by age (career stage) curve
- Color-scaled cost of living (COL) adjusted regional median earning map
- Wage, number of workers and job growth projection tool-tip

**Intuition:** M.O.R.E. is better than state of the art because

#### M.O.R.E.

- Integrated database
- Representative dataset
- Interactive Exploration

M:0.R.E.

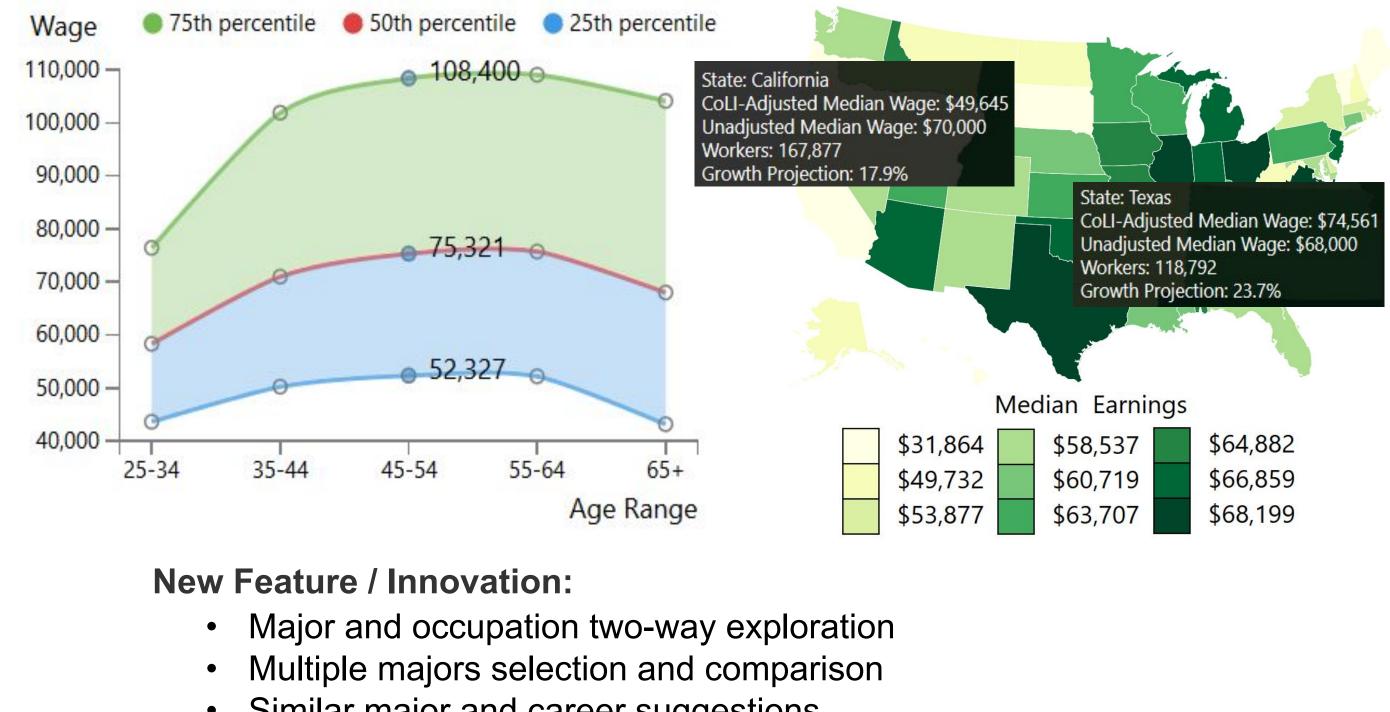
- Range, average, median, percentile
- Current and Forward Looking

### **Existing**

- Scattered information
- incidental data collection
- Static table
- Aggregated average

Survey takers will be automatically redirected in 7:32

Stale



Regional Median Earnings, Adjusted for Cost of Living

- Similar major and career suggestions
- Earning by age range (career stage)Regional COL adjusted earnings
- Job growth projection by state

Earning by Age

#### **Data**

The main dataset for this project is the 2012-2016 ACS 5-year PUMS data file, consisting of more than 15 million records and 280 columns. The dataset was filtered and adjusted with the criteria below:

- College major and occupation required
- Worked at least 30 hours a week for some period in the last 12 months
- Earnings numbers were adjusted to reflect a full year's salary

Purchasing power parity (cost of living) and Employment projections datasets are used on an as-is basis after determining that there were no anomalies.

## **Experiments And Results**

**Description:** Participants (n=29) were surveyed about beliefs relating to their college major prior to viewing or using MORE. After filling out the survey, they were taken to MORE and instructed to use the website for a period of ten minutes, exploring whatever interests them. Following ten minutes of website usage, they were taken to a survey asking them the same belief questions as the pre-survey, so that we can determine what changed. They were also asked four questions that allowed us to determine how helpful MORE was, using a 5-point Likert scale, and the survey ended with a qualitative "What could we improve?" question.

### Results:

- Participants (55% male, 45% female) represented a diverse sample of college majors: 31% business majors, 24% liberal arts majors, and 45% STEM majors.
- Belief changes: Between the pre-survey and post-survey, 34% of participants changed answer related to the best major-career paths, 41% changed answer related to earnings for a major, and 38% changed answer related to best US state for a major.

| Likert-scale Questions   | Agree or Strongly Agree |
|--|-------------------------|
| "After using MORE, I feel better educated about how college majors, occupations, and geography are related." | 62.1%                   |
| "Had MORE been available when I was in college, I would have used it to make informed decisions."            | 75.9%                   |
| "I will use MORE again in the future."   | 48.3%                   |
| "I will recommend MORE to a friend."   | 69.0%                   |

#### Major (College) × Accounting Accountants And Auditors Similar Majors Finance • Business Economics • Business Management And Administration • General Business • Economics • International Business • Public Administration • Misc Business & Medical Administration • Statistics And Decision Science • Engineering And Industrial (Other Careers) Accounting Management Occupation **Financial Managers** Acc Misc Managers Accountants And Auditors Chief Executives And Legislators Bookeeping/Accounting Clerks **Bill And Account Collectors** Retail Sales Supervisors Bookeeping/Accounting Clerks Lawyers, Judges, Magistrates **New Accounts Clerks** Management Analysts Food and Tobacco Roasting Office/Admin Supervisors Elementary And Middle School Teachers General And Operations Managers Occupation Accountants And Auditors clear Similar Careers Accounting Tax Preparers • Tax Examiners/Collectors • Bookeeping/Accounting Clerks • Financial Managers • Budget Analysts • Parking Lot Attendants • Cement Masons/Finishers • Payroll And Timekeeping Clerks • Financial Examiners • Misc Install/Maintenance Helpers Accountants And Auditors (Other Majors) Earnings range for selected careers Wage Histogram **Business Management And Administration** Mean Wage: 84,235 Age Range: All Wage Range: 70k-80k General Business Percent: 10.25% Count: 139993 12% -**Finance** 10% 8% **Economics** 6% English Language And Literature Political Science And Government 4% Marketing And Marketing Research Communications General Education Mathematics Biology Computer Science History Lementary Education iberal Arts Multi-Disciplinary Or General Science 100k 150k 200k 250k 300k 350k 400k Age: 25-34 35-44 45-54 55-64 65+ All

# **Conclusion Remarks**

Experiment results show that MORE is effective at changing major/career beliefs, but there was significant feedback about the application's lack of usability. Moving forward, the following changes will be added:

- Usability improvements including better labeled sections as well as informative tooltips to explain how to interpret the plots
- Pre-set filter to assist selection:
  - Top paid careers
  - Majors with most career options
  - Top careers in nonprofit
- Additional graphs to allow side by side careers comparison
- Wage distribution by majors