



# To Move or Not to Move: College Major and Geographical Mobility

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## Background

- **Education & Geographical Mobility**
  - Education → geographical mobility (Bowles, 1970; Groen, 2004; Bernard et al., 2014)
- **College Major & Mobility**
  - Mainly from the perspectives of social mobility rather than geographical mobility
  - Major → social mobility (Berger, 1988; Wolniak et al., 2008; Altonji et al., 2015)
  - Depends on whether occupation is related to college major (Robst, 2007)
- **Lack analysis of this relationship:**
  - college major & geographical mobility?

## Research Question

- **What is the effect of college major on geographical mobility?**
  - Original → occupational location
- **More specifically:**
  - Geographical mobility means:
    - Location change from high school to occupation
  - Does the relationship remain the same among all majors?

## Hypotheses

- **H1: Location Dependence**
  - Original location has impact on geographical mobility
  - People from different regions may have different probabilities of mobility
- **H2: Influence of College Major**
  - Majors of college education has impact on whether geographical mobility occurs
  - People with different college majors may have different probabilities of mobility

## Data & Variables

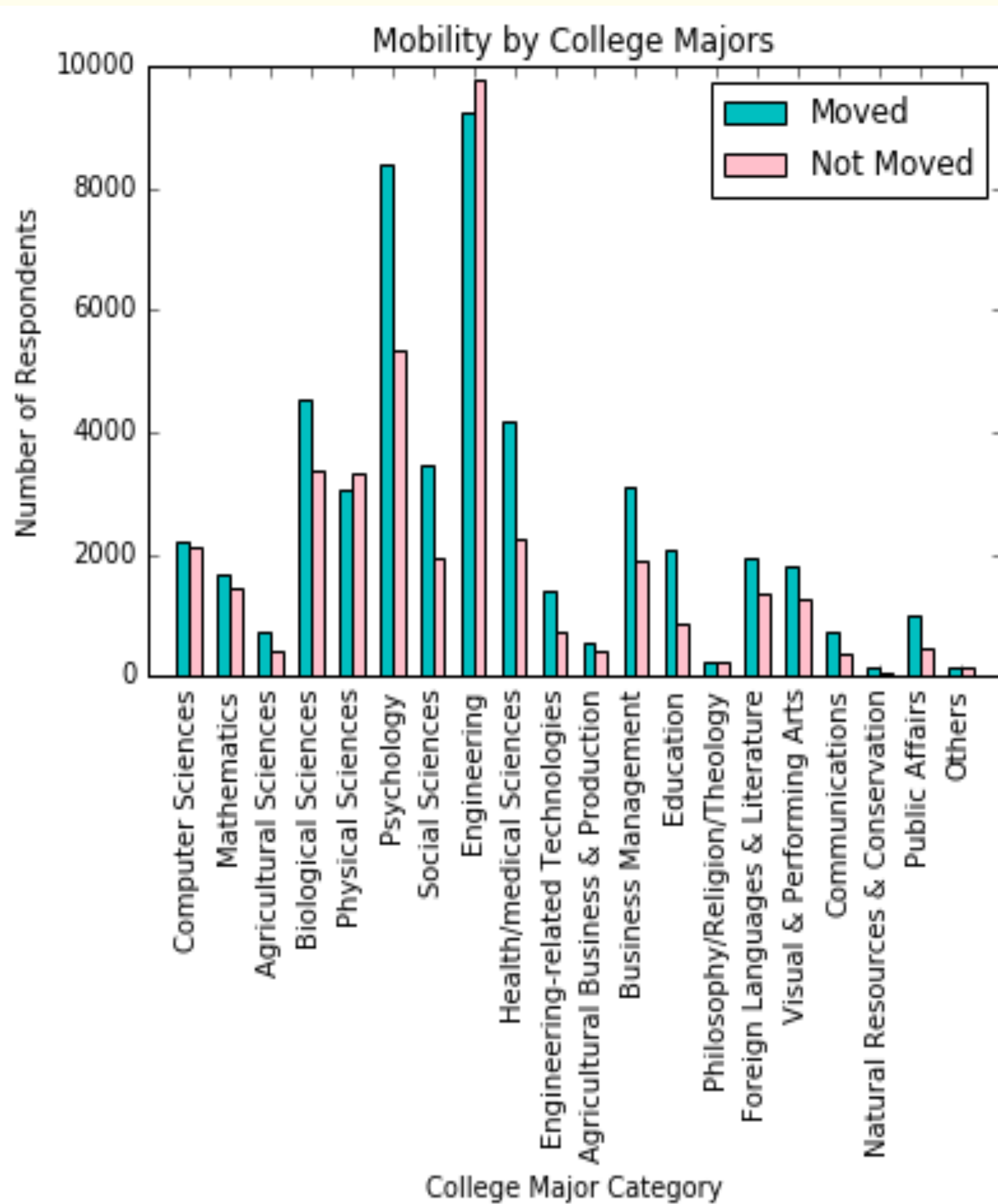
- **NSCG:**  
The 2015 National Survey of College Graduates

Variables	Description
<b>Dependent Variables</b>	
Whether Moved	For logistic regression and prediction tree. 1 if moved, 0 if not
Skills required by Job	For college major classification. Categorical, types of skills required by respondent's current job
<b>Independent Variables</b>	
College Major	Categorical, 20 college major categories
Age	Continuous, age of respondents
Female	1 if the respondent is female, 0 if is male
Race	Categorical, race of respondents
Relationship	1 if in a stable romantic relationship, 0 if not
Original Location	Categorical, 1 to 9 for U.S. regions, 10 for foreign countries
Income	Continuous, logged annualized income in dollars
Job Tenure	Instrumental variable for income. Categorical, job tenure

## Methods

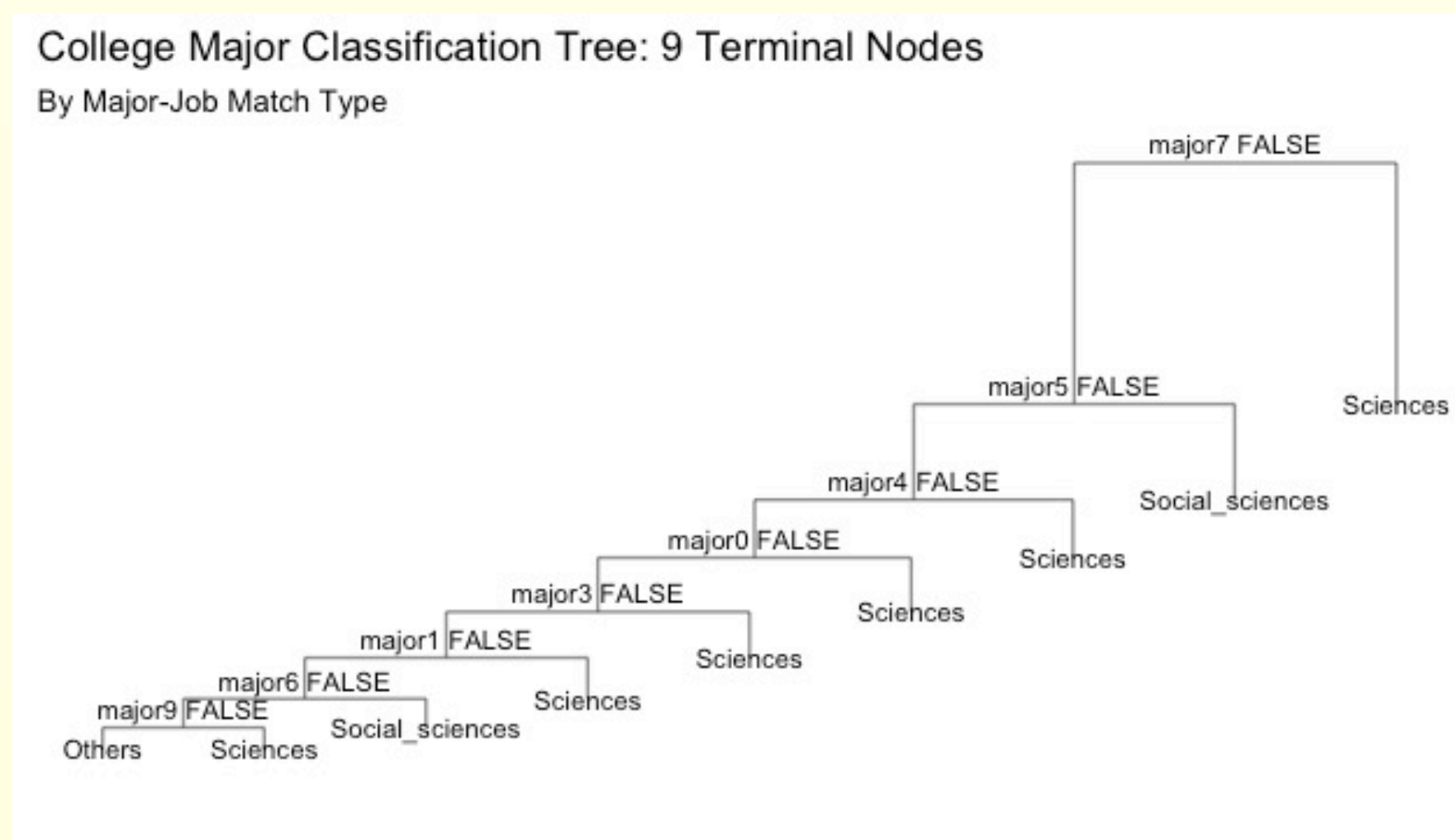
- **Techniques:**
  - Logistic Regression: hypotheses testing
  - Decision Tree: classification & prediction
- **Steps:**
  - College majors classification with tree model
  - Hypotheses testing with logistic regression with instrumental variable
  - Visualization & prediction of mobility with tree model

## Distribution



## College Major Classification

- Patterns of geographical mobility are different among college major categories
- College Majors could be classified
  - Different majors provide different skills required by the labor market
- Use the skills required by individual's current job, to classify the 20 college major categories in the dataset
  - Tree model to classify majors into 3 groups:
    - Fit jobs require (1) sci/tech skills, (2) social sciences skills, (3) other skills



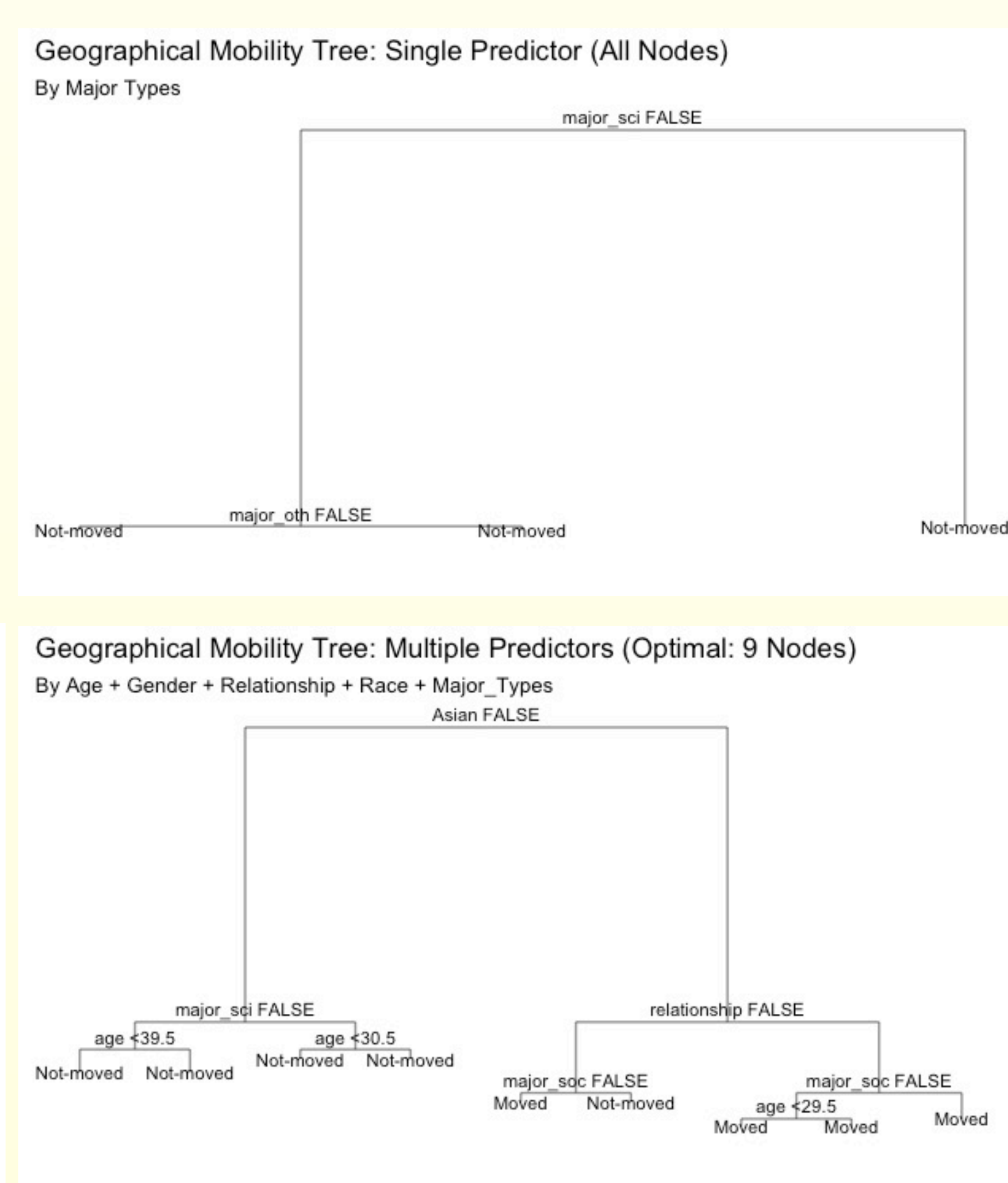
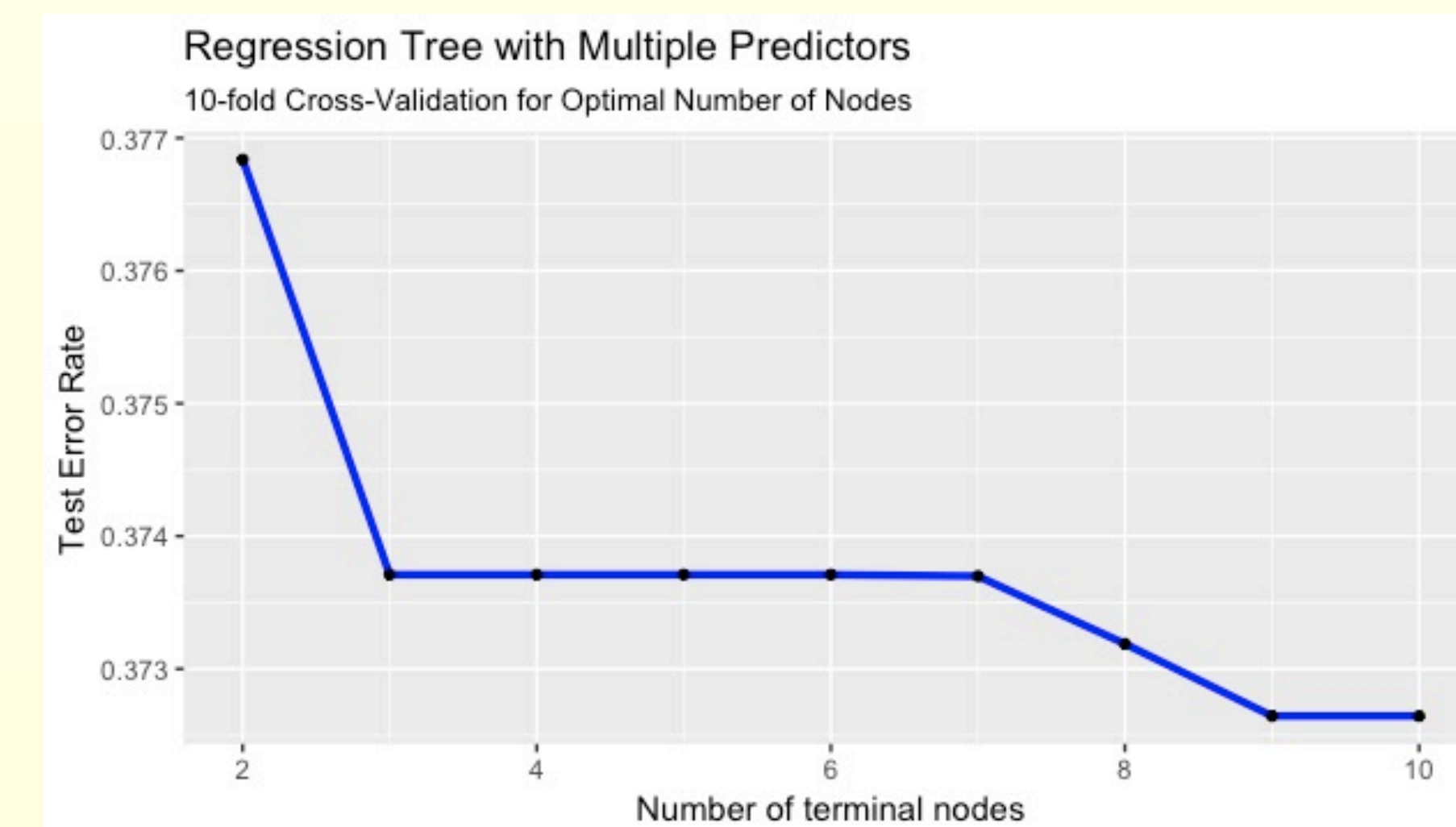
## Results of Logistic Regression

Dependent variable: Whether Moved			
VARIABLES	(1)	(2)	(3)
Log(Income) with IV	-5.04e-05	-0.000455*	-0.000455*
Age	0.00292***	0.00157***	0.00178***
Female	-0.0418***	-0.0241***	-0.0142***
Black	0.0160***	-0.0174***	-0.0183***
Asian	0.292***	0.00750*	0.00226
Hispanic	0.0281***	-0.00322	-0.00546
Stable Relationship	0.0685***	0.0154***	0.0151***
Baseline: New England Region			
Middle Atlantic		-0.0117	-0.0112
East North		-0.0510***	-0.0496***
West North		-0.0575***	-0.0556***
South Atlantic		-0.117***	-0.116***
East South Central		-0.0212*	-0.0194*
West South Central		-0.130***	-0.128***
Mountain Region		-0.0288***	-0.0285***
Pacific & US Territory		-0.185***	-0.186***
Foreign Country		0.590***	0.591***
Majors with: Technical Skills			0.0493***
Majors with: Social Sciences Skills			0.0426***
Constant	0.223***	0.336***	0.289***
Observations	90,660	90,660	90,660
R-squared	0.057	0.275	0.277

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Tree Model: Visualization & Prediction

- **Use tree models to:**
  - (1) Visualize the relationship between college major and geographical mobility
  - (2) Predict whether individuals would move, given college major
  - (3) Predict whether individuals would move, given college major and demographic factors
- **Use the classified college major:**
  - to reduce dimension of analysis



## Conclusion & Discussion

- **Hypotheses testing:**
  - Probabilities of geographical mobility are different among regions.
  - Majors of college education influences geographical mobility
- **Mobility Prediction:**
  - College major as single predictor could not lead to useful prediction
  - Combined with other factors, college major could provide information for prediction
  - College major is useful but not vital
- This study only provides a glimpse of the relationship between college major and geographical mobility
- **Further Questions:**
  - How does original location influence mobility? What role does it play
  - Does a specific category of college major provide great opportunity of social/geographical mobility?
  - e.g. computational social science ☺
  - The association between social mobility & geographical mobility?

## Limitations

- **Data**
  - The NSCG lacks specific geographical information, only providing regions.
  - The NSCG may not be representative to population distribution. It has a special interest in young college graduate with sciences/technology majors.
- **Method**
  - Would take the dimension of time into consideration in the future.
  - More advanced techniques, such as spatial analysis tools/models, could have been applied, given better data.

## References

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