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# Bottom Line up Front: Results from a Randomized Experiment on Interpreting College Affordability

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# BOTTOM LINE UP FRONT: RESULTS FROM A RANDOMIZED EXPERIMENT ON INTERPRETING COLLEGE AFFORDABILITY

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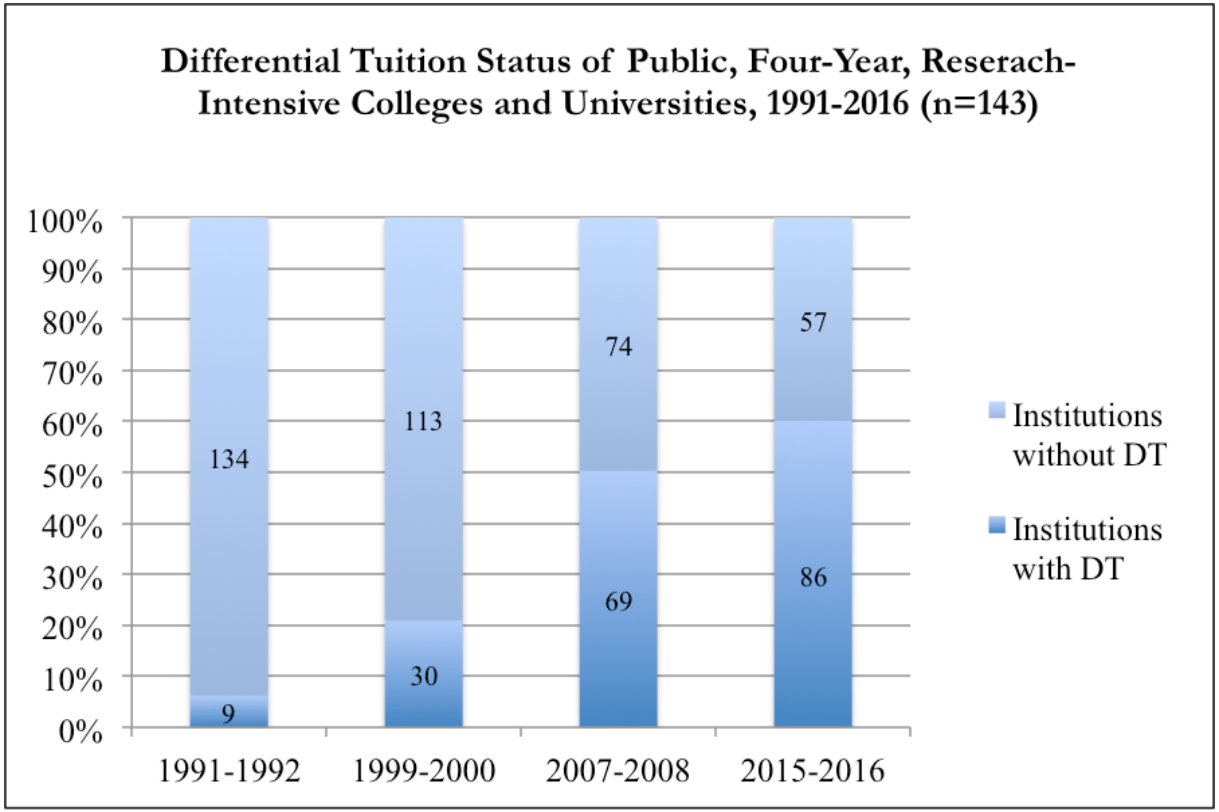
# Differential Tuition (DT) - Background

- DT policies are the purposeful variation in undergraduate tuition by major area of study and year of enrollment (Nelson, 2008)
- DT rates can be assessed by:
  - Program of study
  - Class standing
  - Credit hours
  - Semester
  - Academic year
- DT rates may aid universities in replacing lost state funding, offset costs of delivering higher-cost programs, charge a premium for potentially higher future earnings

# Prior Research



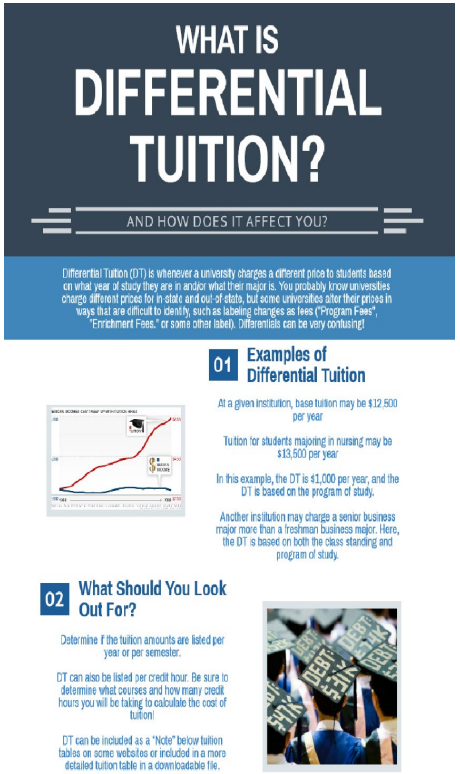
# Research Questions

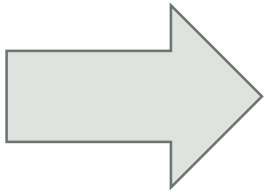
- Lack understanding of how DT may impact college choice process including understandings of potential costs of college
- How might DT policies perpetuate inequities in postsecondary education?
    - Q1: Does the complexity of how institutions display tuition information affect how individuals comprehend the information?
    - Q2: Does an educational infographic on DT impact how individuals comprehend the displayed tuition information?
    - Q3: Do higher levels of education moderate how accurately individuals comprehend tuition information?

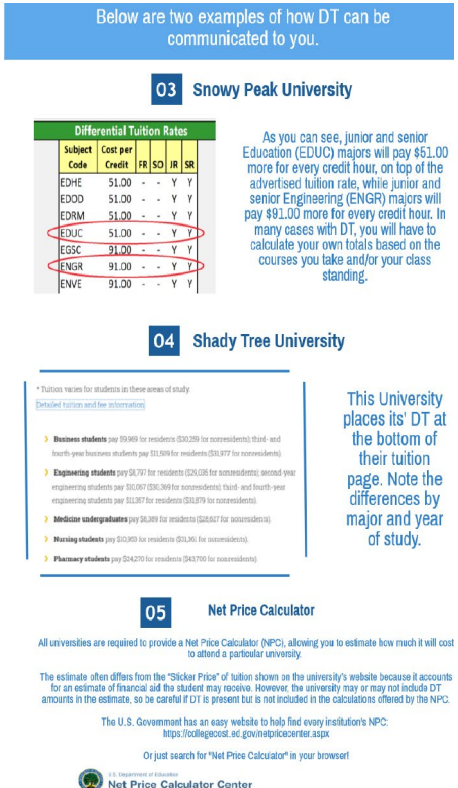
# Methods

- Randomized experiment administered online through Amazon's Mechanical Turk and Qualtrics
  - Participants were randomly assigned to treatment or control groups
  - Treatment group received infographic describing DT prior to taking survey
- Survey Design
  - A brief description of DT
  - Three tuition tables, each with three questions asking for interpretation of information displayed… some requiring calculations
  - Background information such as highest level of education
  - Survey included a catch item to remove "mischievous responders"

# The Infographic “Treatment”





# Tuition Tables: Example 1

**EXAMPLE 1**
**ESTIMATED COSTS OF ATTENDANCE WHILE LIVING ON-CAMPUS, PER YEAR, 2016-17**

| | Resident (In-State) | Nonresident (Out-of-State) |
|---|---|---|
| Billed Expenses | | |
| Tuition & Fees* | $7,650.00 | $25,353.00 |
| Housing and Meals | $10,155.00 | $10,155.00 |
| **Total Billed Expenses** | **$17,805.00** | **$35,508.00** |
| Other Estimated Expenses | | |
| Books and Supplies | $900.00 | $900.00 |
| Personal Expenses | $1,654.00 | $1,654.00 |
| Transportation | $535.00 | $535.00 |
| **Total Estimated Expenses** | **$3,089.00** | **$3,089.00** |

# Tuition Tables: Examples 2 & 3

**EXAMPLE 2**
**ESTIMATED COSTS OF ATTENDANCE WHILE LIVING ON-CAMPUS, PER YEAR, 2016-17**

| | Resident (In-State) | Nonresident (Out-of-State) |
|---|---|---|
| Billed Expenses | | |
| Tuition & Fees* | $7,650.00 | $25,353.00 |
| Housing and Meals | $10,155.00 | $10,155.00 |
| **Total Billed Expenses** | **$17,805.00** | **$35,508.00** |
| Other Estimated Expenses | | |
| Books and Supplies | $900.00 | $900.00 |
| Personal Expenses | $1,654.00 | $1,654.00 |
| Transportation | $535.00 | $535.00 |
| **Total Estimated Expenses** | **$3,089.00** | **$3,089.00** |

*Tuition & Fees vary for students in these areas of study:

- **Business** students will pay $8,453.00 for residents ($26,250.00 for nonresidents); third and fourth year business students will pay an additional $1,250.00 in tuition.
- **Education** students will pay $8,400.00 for residents ($26,050.00 for nonresidents).
- **Nursing** students will pay $7,932.00 for residents ($25,986.00 for nonresidents); second year nursing students will pay $8,125.00 for residents ($26,254.00 for nonresidents); third and fourth year nursing students will pay $8,643.00 for residents ($26,756.00 for nonresidents).
- **Engineering** students will pay $11,436.00 for residents ($29,247.00 for nonresidents).
- **Biology** undergraduates will pay an additional $530.00 per semester for lab fees.

**EXAMPLE 3**
**ESTIMATED COSTS OF ATTENDANCE WHILE LIVING ON-CAMPUS, PER YEAR, 2016-17**

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Notes:

- **Education** students attending class at the off-campus site will pay an additional fee of $250.00 per semester.
- An additional fee for **Equine Studies** students is disclosed on the registrar's website.
- **English Literature** students enrolled after Fall 2015 will pay an additional $50.00 supplies fee per academic year.

# Participants (n=796)

| | N | % |
|---|---|---|
| Treatment | 386 | 48.5 |
| Control | 410 | 51.5 |
| Some High School, High School Diploma or GED | 42 | 5.4 |
| Some College | 157 | 19.8 |
| Associate's Degree | 99 | 12.5 |
| Bachelor's Degree | 360 | 45.5 |
| Master's Degree | 110 | 13.9 |
| Doctoral or Professional Degree | 23 | 2.9 |
| First Generation Student | 382 | 48.0 |
| Non-First Generation Student | 414 | 52.0 |

# Analytical Approach

## Q1: Effects of Complexity

- Descriptive Statistics and Regression Intercepts

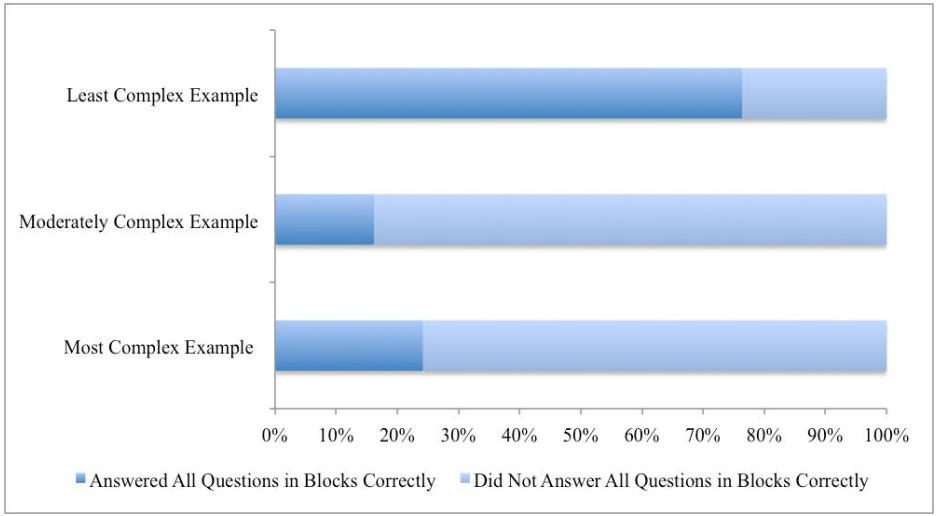
## Q2: Impact of Treatment & Q3: Perpetuation of Inequities

- Binary Logistic Regression
- Ordinary Least Squares Regression

## Outcomes

- Correctly answering all questions per tuition table (Y/N)
- Total number of correct answers in interpreting tuition tables

# Findings: Q1) Effects of Complexity




## Odds Ratios of Intercepts:

- Least Complex (EX1): 3.234
- Moderately Complex (EX2): 0.193
- Most Complex (EX3): 0.320

- Decreasing ORs indicates: decreasing accuracy as complexity increases

# Findings: Q2) Impact of Treatment

- Effect of treatment was not statistically significant on
  - Odds of answering all questions correctly in *Least, Moderate, and Most Complex Examples*
  - Total number of correct responses
- Unsure how treatment was utilized by respondents
- Other infographics may be a more effective treatment

# Findings: Q3) Inequalities…

Least Complex (Ex1):

- Higher Education Levels resulted in higher odds of answering all questions correctly

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| **INTERCEPT** | | | | |
| *B(S.E.)*= | 1.174 (0.083)*** | 1.212 (0.117)*** | 0.808 (0.323)* | 1.111 (0.357)** |
| *OR*[i]= | 3.234 | 3.362 | 2.243 | 3.038 |
| **TREATMENT** | | | | |
| *B(S.E.)*= | | -0.079 (0.167) | -0.081 (0.168) | -0.022 (0.174) |
| *OR* = | | 0.924 | 0.922 | 0.978 |
| **SOME COLLEGE**[ii] | | | | |
| *B(S.E.)*= | | | 0.186 (0.362) | 0.347 (0.376) |
| *OR* = | | | 1.205 | 1.414 |
| **ASSOC DEG** | | | | |
| *B(S.E.)*= | | | 0.576 (0.400) | 0.723 (0.414) |
| *OR* = | | | 1.779 | 2.060 |
| **BACH DEG** | | | | |
| *B(S.E.)*= | | | 0.655 (0.355) | 0.951 (0.372)* |
| *OR* = | | | 1.924 | 2.588 |
| **MAST DEG** | | | | |
| *B(S.E.)*= | | | 0.752 (0.410) | 1.221 (0.434)** |
| *OR* = | | | 2.121 | 3.389 |
| **DOCT DEG** | | | | |
| *B(S.E.)*= | | | 1.781 (0.816)* | 2.097 (0.839)* |
| *OR* = | | | 5.935 | 8.140 |
| **FIRST GEN** | | | | |
| *B(S.E.)*= | | | -0.273 (0.184) | -0.187 (0.192) |
| *OR* = | | | 0.761 | 0.829 |
| **CONTROLS**[iii] | No | No | No | Yes |

# Findings: Q3) Inequalities…

Moderately Complex (Ex2):

- Respondents with doctoral or professional degrees had greater odds of answering all questions correctly

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| **INTERCEPT** | | | | |
| *B(S.E.)*= | -1.643 (0.096)*** | -1.783 (0.141)*** | -2.283 (0.485)*** | -1.950 (0.498)*** |
| *OR*[i]= | 0.193 | 0.168 | 0.102 | 0.142 |
| **TREATMENT** | | | | |
| *B(S.E.)*= | | 0.276 (0.193) | 0.299 (0.195) | 0.330 (0.198) |
| *OR* = | | 1.318 | 1.348 | 1.391 |
| **SOME COLLEGE**[ii] | | | | |
| *B(S.E.)*= | | | 0.440 (0.524) | 0.652 (0.533) |
| *OR* = | | | 1.552 | 1.919 |
| **ASSOC DEG** | | | | |
| *B(S.E.)*= | | | -0.011 (0.575) | 0.178 (0.582) |
| *OR* = | | | 0.989 | 1.195 |
| **BACH DEG** | | | | |
| *B(S.E.)*= | | | 0.506 (0.508) | 0.798 (0.519) |
| *OR* = | | | 1.659 | 2.220 |
| **MAST DEG** | | | | |
| *B(S.E.)*= | | | 0.326 (0.559) | 0.720 (0.574) |
| *OR* = | | | 1.386 | 2.055 |
| **DOCT DEG** | | | | |
| *B(S.E.)*= | | | 1.239 (0.674) | 1.586 (0.691)* |
| *OR* = | | | 3.451 | 4.886 |
| **FIRST GEN** | | | | |
| *B(S.E.)*= | | | 0.147 (0.209) | 0.207 (0.214) |
| *OR* = | | | 1.158 | 1.230 |
| **CONTROLS**[iii] | No | No | No | Yes |

# Findings: Q3) Inequalities…

Most Complex (Ex3):

- Education levels were not statistically significant

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| **INTERCEPT** | | | | |
| *B(S.E.)*= | -1.139 (0.083)*** | -1.158 (0.116)*** | -1.203 (0.353)*** | -0.964 (0.370)** |
| *OR*[i]= | 0.320 | 0.314 | 0.300 | 0.381 |
| **TREATMENT** | | | | |
| *B(S.E.)*= | | 0.039 (0.165) | -0.252 (0.402) | 0.080 (0.171) |
| *OR* = | | 1.039 | 1.039 | 1.083 |
| **SOME COLLEGE**[ii] | | | | |
| *B(S.E.)*= | | | -0.252 (0.402) | -0.950 (0.411) |
| *OR* = | | | 0.777 | 0.910 |
| **ASSOC DEG** | | | | |
| *B(S.E.)*= | | | -0.316 (0.435) | -0.199 (0.441) |
| *OR* = | | | 0.729 | 0.819 |
| **BACH DEG** | | | | |
| *B(S.E.)*= | | | 0.226 (0.378) | 0.469 (0.388) |
| *OR* = | | | 1.253 | 1.599 |
| **MAST DEG** | | | | |
| *B(S.E.)*= | | | 0.122 (0.423) | 0.496 (0.438) |
| *OR* = | | | 1.130 | 1.642 |
| **DOCT DEG** | | | | |
| *B(S.E.)*= | | | 0.377 (0.583) | 0.611 (0.599) |
| *OR* = | | | 1.458 | 1.843 |
| **FIRST GEN** | | | | |
| *B(S.E.)*= | | | -0.019 (0.180) | 0.041 (0.184) |
| *OR* = | | | 0.981 | 1.042 |
| **CONTROLS**[iii] | No | No | No | Yes |

# Findings: Q3) Inequalities…

Total Correct:

- Education matters for the total number of correct responses, with having a Bachelor's or a Doctoral/Professional degree having the highest impact

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| **INTERCEPT** | 5.866*** | 5.851*** | 5.128*** | 5.514*** |
| | (0.072) | (0.100) | (0.299) | (0.296) |
| **TREATMENT** | | 0.032 | 0.049 | 0.134 |
| | | (0.143) | (0.142) | (0.135) |
| **SOME COLLEGE**[i] | | | 0.627 | 0.800* |
| | | | (0.335) | (0.318) |
| **ASSOC DEG** | | | 0.354 | 0.496 |
| | | | (0.357) | (0.338) |
| **BACH DEG** | | | 0.965** | 1.275*** |
| | | | (0.322) | (0.307) |
| **MAST DEG** | | | 0.586 | 1.092** |
| | | | (0.362) | (0.346) |
| **DOCT DEG** | | | 1.727*** | 2.044*** |
| | | | (0.521) | (0.494) |
| **FIRST GEN** | | | -0.043 | 0.089 |
| | | | (0.154) | (0.146) |
| **CONTROLS**[ii] | No | No | No | Yes |

# Implications/Conclusions

- Institutions with DT policies should work toward increased transparency when communicating policies to prospective students and families
    - Less than 25% of individuals were able to accurately answer questions from the two tables featuring DT by program of study and by year.
- Individuals with less than a Bachelor's degree are much more disadvantaged when it comes to interpreting tuition information
- Social stratification may perpetuate through DT policies if those with less education are more likely to misunderstand potential costs based on incorrect interpretations

# Final Recommendations

- Ensures that students have clear information to inform decision-making in the college choice process
- Institutions with DT policies may need to present various tuition rates in table form
- All Net Price Calculators should be required to incorporate DT information
- The timeline of exposing students to information regarding complex tuition policies needs to reflect the decision-making literature
  - Incorporate DT policy information in the FAFSA process

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