Divergent Pathways: New Measurements of Undergraduate Success

Center for Studies of Higher Education
U.C. Berkeley
March 3, 2020

Richard Arum
UCI School of Education
Presentation Outline

I. Project Motivations

II. Next Generation Undergraduate Success Measurement System
   A. Administrative Data
   B. LMS Data
   C. Performance Assessments, Surveys, Experiential Sampling

III. Sample and Descriptive Data from Academic, Social, Psychological and Civic Measures

IV. Next Steps and Measurement System Dissemination
Higher Education Challenges

• Individuals and society increasingly dependent on expanded higher education opportunities, but U.S. falling behind other countries.

• U.S. higher education model is expensive, constraining expansion to serve more diverse students.

• Structural problems have contributed to institutional underperformance in student completion and learning (particularly for underrepresented minority groups).

• Public opinion is growing less supportive of higher education and skeptical of its management, value and quality.
Data-Driven Institutional Improvement Paradox

• Higher education has been at the forefront of developing and promoting data-driven institutional improvement efforts for governments, policy makers, firms, non-profit organizations and K-12 schools.

• The higher education sector is a laggard at adopting data-driven approaches internally.

• Technological changes are greatly accelerating the capacity to deliver, measure and improving educational processes.
A Strategic Opportunity at UCI

- UCI has gained a national reputation for being the leading research university that has done the most to serve diverse undergraduate students well
  - #1 on *The New York Times’* College Access Index
  - #1 in *Money* magazine’s Best Colleges
  - #3 in Forbes best public university value
  - #7 in public universities in *US News and World Report* Rankings

- UCI is at the forefront of educational science
  - New School of Education based on social, behavioral and improvement science
  - Depth of faculty expertise and interest

- UCI institutional leadership, faculty and students supportive of data-driven improvement efforts
Project Goals

- Develop new measures of undergraduate experiences and outcomes

- Inspire and inform efforts to improve institutional performance and advance educational equity

- Promote deeper understanding of educational processes and clearer identification of value in educational investments (particularly liberal arts education, broadly defined)
UCI undergraduate students (N=1,248)
  • Freshmen (797)
  • Continuing Juniors (270)
  • Transferring Juniors (181)

Longitudinal design for two years (intention to track four years: freshmen to graduation; juniors for two years post-graduation)

Convenience sampling this year (intention to add new cohort of freshmen/juniors next year)

Participant incentives (full sample $50 per year for surveys and performance assessments; subsample also receives independent study credit)

Data de-identified; research methods reviewed/approved by UCI human subject protection committee
Data Sources

Strand 1
• Administrative data
• Student Affairs

Strand 2
• Learning Management Systems (LMS)

Strand 3
• Performance Assessments
• Surveys
• Experience Sampling

Rachel Baker
Assistant Professor of Education

Mark Warschauer
Professor of Education and Informatics

Jacquelynne Eccles
Distinguished Professor of Education and Psychology

Richard Arum
Dean of the School of Education and Professor of Education, Sociology, Criminology and Society
Project Team

**Faculty**
- Richard Arum (PI)
- Rachel Baker (Lead)
- Michael Dennin (co-PI)
- Nia Dowell
- Jacque Eccles (Lead)
- Jutta Heckhausen
- Mark Warschauer (Lead)
- Charles E. Wright
- Di Xu

**Affiliated Faculty**
- Peter Bearman
- Christian Fischer
- Julia Moeller

**Post-Doc**
- Luise von Keyserlingk

**Data Warehouse Developer & Lab Manager**
- Don Mathew
- Katsumi Yamaguchi-Pedroza

**Undergraduate Researchers**
- Cassie Chung
- Ariana Hansen
- Christopher Martinez
- Annalisa Raphael
- Jonathan Trujillo

**Graduate Student Researchers**
- Hye Rin Lee
- Xunfei Li
- Gabe Orona
- Remy Pages
- Renzhe Yu

*Funded by the Andrew W. Mellon Foundation; endorsed by the ASUCI Student Senate*
Strand 1

Administrative Data

- Admission Records
  - Academic history (high school GPA, AP course records, etc.)
  - Demographics (gender, race and ethnicity, etc.)
  - Family background (parental education, family income, etc.)

- College Records
  - Academic standing (cumulative units, probation, etc.)
  - Course-taking pathways (course-level transcripts)
  - Membership in special programs (honors program, study abroad, etc.)

→ Developing new measures of course-level peer composition
Strand 2

Learning Management Systems (Canvas)

- Clickstream data
  - Logs of students’ visits to any course page
- Discussion forum data
  - Logs of students’ actions within the forums
  - Content of discussion posts
- Assignment and quiz data
  - Gradebook
  - Students’ textual submissions (with metadata)
- Course design data
  - Course syllabi
  - Structures of the course space
  - Usage of different Canvas functions

→ Developing new measures of academic engagement, including conscientiousness, pacing, peer and faculty interaction
Strand 3

Full Sample

Performance Assessments:
- Critical Thinking – ETS
- Collaborative Problem-Solving – ETS
- Confirmation Bias – ETS
- Perspective Taking – ETS
- Civic Online Reasoning – Sam Wineburg

Core Survey:
- College Expectations
- Course choices and Study Behavior
- Educational and Occupational Aspirations
- Political Affiliations
- Social Network
- Ability Beliefs
- Mental Health
- Personality
- …
Strand 3

Performance Assessments:
- Critical Thinking – ETS
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Core Survey:
- College Expectations
- Course choices and Study Behavior
- Educational and Occupational Aspirations
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- Social Network
- Ability Beliefs
- Mental Health
- Personality
- …

Assessment 1, Fall 2019
Performance Tests,
Core Survey

(6) End of Term Surveys,
AY2019-2020, AY2020-2021
Course Experiences and
Plans

Assessment 2, Spring 2021
Performance Tests,
Core Survey

Full Sample

UCI
Below is information about 3 apartments. Your task is to rank order the apartments based on the strengths and weaknesses (in this first phase, you will do this by yourself; later, you will work with your partners). You will have 10 minutes to study this material and make the ranking.

**Apartment A**
- Mail and packages are delivered directly to tenants' doors.
- The landlord is offering a rent special that guarantees the same rent for two years.
- The apartment includes free wi-fi.
- A celebrity once lived in the building.
- The exterior of the building is brick.
- The street on which the building stands is named "Tulip Street".
- The $200 pet fee paid at the start of the lease is non-refundable.
- Tenants are not permitted to paint their walls.
- The only available parking for tenants' cars is on street.

**Apartment B**
- The apartment has central airconditioning.
- The $250 pet deposit is refundable (minus any damages) at the end of the lease.
- A washer and dryer is included in the apartment.
- Within walking distance of school and work for all roommates.
- The landlord offers 24-hour maintenance service.
- The supermarket and shopping district are close by.
- The hallways and stairwells are painted green and white.
- The landlord usually raises the rent by 20 percent after the first year's lease.
- Closet space is limited.

**Rank-order the 3 apartments from the best to worst, such as ABC (if A is best and C is worst) or CAB (if C is best and B is worst). After you enter your rank order, press SUBMIT.**
ETS Collaborative Problem Solving

Response changes – all teams

- This Sankey plot shows the changes from initial (left) to revised responses (right).
- The width of the band indicate the number of people.
- The labels on the plot is named as: response string_initial/revise – number of people
- Example: CBA_j – 57: there are 57 people entered CBA in their initial response

Initial score
BCA -> 2; BAC -> 1; else -> 0

Revised score
ACB -> 2; ABC -> 1; else -> 0
ETS Collaborative Problem Solving

Within team interaction example

A team that has a lot of social interaction before tackling the task
ETS Collaborative Problem Solving

Communication contents
Weekly Surveys

- Course related ability beliefs and values
- Learning behavior
- Academic activities
- Non academic activities
- Social network
- Social belonging
- Mental health
- Discrimination
- …

Experience Sampling

- Administered on Smartphones
- 50 x 3min surveys
- Administered at random time points across the term
- Questions:
  - Where are you?
  - What are you doing?
  - With whom are you with?
  - How are you feeling?
Strand 3

Sub-Sample (N = 350)

Weekly Surveys
- Course related ability beliefs and values
- Learning behavior
- Academic activities
- Non academic activities
- Social network
- Social belonging
- Mental health
- Discrimination
- ...

Experience Sampling
- Administered on Smartphones
- 50 x 3min surveys
- Administered at random time points across the term
- Questions:
  - Where are you?
  - What are you doing?
  - With whom are you with?
  - How are you feeling?
Experience Sampling

EXAF Survey 1

2. Where were you when you were beeped?

- My home/ apartment/ dorm
- A friend’s/ family member’s home
- A study place (e.g., library, classroom, research lab)
- My workplace
### Weighted Study Sample and UCI Freshman/Junior Population

<table>
<thead>
<tr>
<th></th>
<th>Weighted Study Sample</th>
<th>UCI Freshman/Junior Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>66%</td>
<td>56%</td>
</tr>
<tr>
<td>Male</td>
<td>34%</td>
<td>44%</td>
</tr>
<tr>
<td>Not First Generation</td>
<td>46%</td>
<td>49%</td>
</tr>
<tr>
<td>First Generation</td>
<td>54%</td>
<td>51%</td>
</tr>
<tr>
<td><strong>(min – max)</strong></td>
<td>(0-100%)</td>
<td>(0-100%)</td>
</tr>
</tbody>
</table>

*Note.* For weighted study sample: Female n = 832, Male n = 414, Not First Generation n = 560, First Generation n = 688; For Mellon pool: Female n = 6533, Male n = 5108, Not First Generation n = 5970, First Generation n = 5757.
### Weighted Study Sample and UCI Freshman/Junior Population

<table>
<thead>
<tr>
<th></th>
<th>Weighted Study Sample</th>
<th>UCI Freshmen/Junior Population</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asian / Asian American</strong></td>
<td>36%</td>
<td>34%</td>
</tr>
<tr>
<td><strong>Hispanic / Latino</strong></td>
<td>34%</td>
<td>26%</td>
</tr>
<tr>
<td><strong>White, non-Hispanic</strong></td>
<td>16%</td>
<td>13%</td>
</tr>
<tr>
<td><strong>International student</strong></td>
<td>8%</td>
<td>19%</td>
</tr>
<tr>
<td><strong>Other/ undeclared</strong></td>
<td>6%</td>
<td>7%</td>
</tr>
<tr>
<td><strong>(min – max)</strong></td>
<td>(0-100%)</td>
<td>(0-100%)</td>
</tr>
</tbody>
</table>

*Note.* For weighted study sample: Asian / Asian American n = 473, Hispanic / Latino n = 422, White n = 174, International Student n = 96, Other n = 83; For Mellon pool: Asian / Asian American n = 4020, Hispanic / Latino n = 3105, White n = 2211, International Student n = 1541, Other n = 850.
## Weighted Study Sample and UCI Freshman/Junior Population

<table>
<thead>
<tr>
<th></th>
<th>Weighted Study Sample</th>
<th>UCI Freshman/Junior Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology and Health Sciences</td>
<td>25%</td>
<td>20%</td>
</tr>
<tr>
<td>STEM (non Bio/Health)</td>
<td>25%</td>
<td>27%</td>
</tr>
<tr>
<td>Social/Appl. Soc. Sciences</td>
<td>36%</td>
<td>36%</td>
</tr>
<tr>
<td>Humanities and Arts</td>
<td>8%</td>
<td>9%</td>
</tr>
<tr>
<td>Undeclared</td>
<td>6%</td>
<td>7%</td>
</tr>
</tbody>
</table>

_{min – max}_ (0-100%) (0-100%)

*Note.* For weighted study sample: Biology and Health Sciences n = 334, STEM (non Bio/Health) n = 299, Social/Appl. Soc. Sciences n = 422, Humanities and Arts n = 94, Undeclared n = 99; For Mellon pool: Biology and Health Sciences n = 2376, STEM (non Bio/Health) n = 3201, Social/Appl. Soc. Sciences n = 4234, Humanities and Arts n = 1051, Undeclared n = 865.
## Social (Network): Incoming Friends at UCI

<table>
<thead>
<tr>
<th></th>
<th>Proportion having incoming friends at UCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian / Asian American</td>
<td>77%</td>
</tr>
<tr>
<td>Hispanic / Latino</td>
<td>67%</td>
</tr>
<tr>
<td>White, non-Hispanic</td>
<td>50%</td>
</tr>
<tr>
<td>International student</td>
<td>54%</td>
</tr>
<tr>
<td>Other/ undeclared</td>
<td>59%</td>
</tr>
<tr>
<td>Not First Generation</td>
<td>63%</td>
</tr>
<tr>
<td>First Generation</td>
<td>71%</td>
</tr>
<tr>
<td><strong>(min – max)</strong></td>
<td><em>(0 - 100%)</em></td>
</tr>
</tbody>
</table>

*Note. Asian / Asian American n = 352, Hispanic / Latino n = 297, White n = 119, International Student n = 54, Other n = 68.*
### Social (Network): Incoming Friends at UCI

<table>
<thead>
<tr>
<th></th>
<th>Proportion having incoming friends at UCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology and Health Sciences</td>
<td>75%</td>
</tr>
<tr>
<td>STEM (non Bio/Health)</td>
<td>69%</td>
</tr>
<tr>
<td>Social/Appl. Soc. Sciences</td>
<td>63%</td>
</tr>
<tr>
<td>Humanities and Arts</td>
<td>49%</td>
</tr>
<tr>
<td>Undeclared</td>
<td>70%</td>
</tr>
<tr>
<td><strong>(min – max)</strong></td>
<td><strong>(0 - 100%)</strong></td>
</tr>
</tbody>
</table>

*Note.* Biology and Health Sciences n = 255, STEM (non Bio/Health) n = 206, Social/Appl. Soc. Sciences n = 296, Humanities and Arts n = 61, Undeclared n = 71.
Mental Health Distress and Social Support

<table>
<thead>
<tr>
<th></th>
<th>Mental Health Distress</th>
<th>W2 Faculty Support</th>
<th>W6 Faculty Support</th>
<th>W2 Peer Support</th>
<th>W6 Peer Support</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biology and Health Sciences</strong></td>
<td>13%</td>
<td>58 (2)</td>
<td>58 (2)</td>
<td>68 (3)</td>
<td>67 (3)</td>
</tr>
<tr>
<td><strong>STEM (non Bio/ Health)</strong></td>
<td>19%</td>
<td>54 (3)</td>
<td>48 (3)</td>
<td>64 (3)</td>
<td>63 (4)</td>
</tr>
<tr>
<td><strong>Social/ Appl. Soc. Sciences</strong></td>
<td>14%</td>
<td>60 (2)</td>
<td>57 (2)</td>
<td>61 (2)</td>
<td>63 (3)</td>
</tr>
<tr>
<td><strong>Humanities and Arts</strong></td>
<td>22%</td>
<td>55 (7)</td>
<td>54 (7)</td>
<td>50 (2)</td>
<td>49 (7)</td>
</tr>
<tr>
<td><strong>Undeclared</strong></td>
<td>24%</td>
<td>51 (4)</td>
<td>49 (5)</td>
<td>58 (5)</td>
<td>58 (5)</td>
</tr>
<tr>
<td><strong>Not First Generation</strong></td>
<td>14%</td>
<td>57 (2)</td>
<td>55 (2)</td>
<td>60 (2)</td>
<td>59 (2)</td>
</tr>
<tr>
<td><strong>First Generation</strong></td>
<td>17%</td>
<td>58 (2)</td>
<td>55 (2)</td>
<td>65 (2)</td>
<td>65 (2)</td>
</tr>
<tr>
<td><strong>(min - max)</strong></td>
<td>(0 - 100)</td>
<td>(0 - 100)</td>
<td>(0 - 100)</td>
<td>(0 - 100)</td>
<td>(0 - 100)</td>
</tr>
</tbody>
</table>

Note. Mental health distress from K10 screening instrument for psychological distress by Kessler et al. (2002); faculty and student support measures derived from 7 items about social belonging/feeling comfortable to ask for support of peers; 6 items about confidence to get/feeling comfortable to ask for support of faculty. Mean (S.E.). Biology and Health Sciences – mental health n = 91, week 2 n = 203, week 6 n = 77; STEM (no Bio/Health) mental health n = 65, week 2 n = 62, week 6 n = 53; Social/ Appl. Soc. Sciences mental health n = 133, week 2 n = 122, week 6 n = 118; Humanities and Arts mental health n = 18, week 2 n = 17, week 6 n = 16; Undeclared – mental health n = 29, week 2 n = 27, week 6 n = 28.
## Reported Stress

<table>
<thead>
<tr>
<th></th>
<th>Academic</th>
<th>Relationship</th>
<th>Practical</th>
<th>Health</th>
<th>Discrimination</th>
<th>Sexual Orientation</th>
<th>Language &amp; Cultural Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bio and Health Sciences</td>
<td>3.9</td>
<td>1.8</td>
<td>2.3</td>
<td>2.5</td>
<td>0.3</td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>(0.2)</td>
<td>(0.2)</td>
<td>(0.2)</td>
<td>(0.2)</td>
<td>(0.1)</td>
<td>(0.2)</td>
<td>(0.2)</td>
</tr>
<tr>
<td>STEM (non Bio/Health)</td>
<td>3.7</td>
<td>1.8</td>
<td>2.2</td>
<td>2.3</td>
<td>0.7</td>
<td>0.6</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>(0.2)</td>
<td>(0.2)</td>
<td>(0.2)</td>
<td>(0.3)</td>
<td>(0.2)</td>
<td>(0.2)</td>
<td>(0.2)</td>
</tr>
<tr>
<td>Soc./Appl. Soc. Sciences</td>
<td>3.5</td>
<td>1.5</td>
<td>2.5</td>
<td>2.2</td>
<td>0.4</td>
<td>0.3</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>(0.1)</td>
<td>(0.1)</td>
<td>(0.2)</td>
<td>(0.2)</td>
<td>(0.1)</td>
<td>(0.1)</td>
<td>(0.1)</td>
</tr>
<tr>
<td>Humanities and Arts</td>
<td>4.0</td>
<td>1.7</td>
<td>3.1</td>
<td>3.2</td>
<td>0.3</td>
<td>0.3</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>(0.4)</td>
<td>(0.3)</td>
<td>(0.4)</td>
<td>(0.6)</td>
<td>(0.1)</td>
<td>(0.1)</td>
<td>(0.2)</td>
</tr>
<tr>
<td>Undeclared</td>
<td>3.9</td>
<td>1.3</td>
<td>2.8</td>
<td>2.2</td>
<td>0.5</td>
<td>0.4</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>(0.3)</td>
<td>(0.3)</td>
<td>(0.4)</td>
<td>(0.3)</td>
<td>(0.2)</td>
<td>(0.2)</td>
<td>(0.3)</td>
</tr>
<tr>
<td>Not First Generation</td>
<td>3.7</td>
<td>1.7</td>
<td>2.2</td>
<td>2.5</td>
<td>0.4</td>
<td>0.3</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>(0.1)</td>
<td>(0.1)</td>
<td>(0.2)</td>
<td>(0.2)</td>
<td>(0.1)</td>
<td>(0.1)</td>
<td>(0.1)</td>
</tr>
<tr>
<td>First Generation</td>
<td>3.7</td>
<td>1.6</td>
<td>2.6</td>
<td>2.3</td>
<td>0.5</td>
<td>0.4</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>(0.1)</td>
<td>(0.1)</td>
<td>(0.1)</td>
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<td>(0.1)</td>
</tr>
<tr>
<td>(min - max)</td>
<td>(0 - 7)</td>
<td>(0 - 7)</td>
<td>(0 - 7)</td>
<td>(0 - 7)</td>
<td>(0 - 7)</td>
<td>(0 - 7)</td>
<td>(0 - 7)</td>
</tr>
</tbody>
</table>

**Note.** Adapted student stress inventory, originally by Stallman and Hurst (2016), 15 items about perceived stress in different areas: academic, relationship, practical, parenting, health, discrimination, sexual orientation, language/cultural issues. Mean (S.E.). Biology and Health Sciences n = 80, STEM (non Bio/Health) n = 55, Social/ Appl. Soc. Sciences n = 119, Humanities and Arts n = 16, Undeclared n=29.
### Academic Ability, Behaviors and Course Experiences

<table>
<thead>
<tr>
<th></th>
<th>Term GPA</th>
<th>Critical Thinking</th>
<th>Hours Each Class Studying Per Week</th>
<th>Class-Time on Groupwork</th>
<th>Other Class-Time Not Lecturing</th>
<th>Rely on Counselor to Decide Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology and Health Sciences</td>
<td>3.0</td>
<td>163.4</td>
<td>7</td>
<td>4%</td>
<td>16%</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>(0.8)</td>
<td>(0.45)</td>
<td>(0.39)</td>
<td>(0.63)</td>
<td>(1.26)</td>
<td>(1.76)</td>
</tr>
<tr>
<td>STEM (non Bio/Health)</td>
<td>3.1</td>
<td>165.3</td>
<td>6</td>
<td>6%</td>
<td>15%</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>(0.7)</td>
<td>(0.53)</td>
<td>(0.41)</td>
<td>(1)</td>
<td>(1.4)</td>
<td>(1.9)</td>
</tr>
<tr>
<td>Social/Appl. Soc. Sciences</td>
<td>3.3</td>
<td>163.7</td>
<td>6</td>
<td>5%</td>
<td>16%</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>(0.7)</td>
<td>(0.44)</td>
<td>(0.51)</td>
<td>(0.51)</td>
<td>(1.02)</td>
<td>(1.67)</td>
</tr>
<tr>
<td>Humanities and Arts</td>
<td>3.5</td>
<td>165.7</td>
<td>6</td>
<td>4%</td>
<td>21%</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>(0.6)</td>
<td>(0.98)</td>
<td>(0.75)</td>
<td>(0.92)</td>
<td>(3.97)</td>
<td>(3.4)</td>
</tr>
<tr>
<td>Undeclared</td>
<td>2.9</td>
<td>162.1</td>
<td>8</td>
<td>4%</td>
<td>18%</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>(0.8)</td>
<td>(1.23)</td>
<td>(1.33)</td>
<td>(1.16)</td>
<td>(3.46)</td>
<td>(2.53)</td>
</tr>
<tr>
<td>Not First Generation</td>
<td>3.4</td>
<td>166</td>
<td>5.8</td>
<td>5%</td>
<td>17%</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>(0.6)</td>
<td>(0.37)</td>
<td>(0.26)</td>
<td>(0.55)</td>
<td>(1)</td>
<td>(1.43)</td>
</tr>
<tr>
<td>First Generation</td>
<td>3.0</td>
<td>162.5</td>
<td>7</td>
<td>4%</td>
<td>16%</td>
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<tr>
<td></td>
<td>(0.8)</td>
<td>(0.34)</td>
<td>(0.42)</td>
<td>(0.62)</td>
<td>(0.97)</td>
<td>(1.19)</td>
</tr>
<tr>
<td>(min – max)</td>
<td>(1-4)</td>
<td>150-180</td>
<td>0-65</td>
<td>0-62</td>
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</table>

# Academic Ability, Behaviors and Course Experiences

<table>
<thead>
<tr>
<th></th>
<th>Term GPA</th>
<th>Critical Thinking</th>
<th>Hours Each Class Studying Per Week</th>
<th>Class-Time on Groupwork</th>
<th>Other Class-Time Not Lecturing</th>
<th>Rely on Counselor to Decide Major</th>
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</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>3.1</td>
<td>163.8</td>
<td>6</td>
<td>4%</td>
<td>17%</td>
<td>71</td>
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<tr>
<td></td>
<td>(0.8)</td>
<td>(0.3)</td>
<td>(0.27)</td>
<td>(0.43)</td>
<td>(0.82)</td>
<td>(0.98)</td>
</tr>
<tr>
<td>Transfer Junior</td>
<td>3.2</td>
<td>163.9</td>
<td>8</td>
<td>4%</td>
<td>15%</td>
<td>65</td>
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<tr>
<td></td>
<td>(0.7)</td>
<td>(0.7)</td>
<td>(0.82)</td>
<td>(0.87)</td>
<td>(1.84)</td>
<td>(2.25)</td>
</tr>
<tr>
<td>Continuing Junior</td>
<td>3.3</td>
<td><strong>165.7</strong></td>
<td>6</td>
<td>5%</td>
<td>18%</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>(0.6)</td>
<td>(0.68)</td>
<td>(0.42)</td>
<td>(0.98)</td>
<td>(1.76)</td>
<td>(3.07)</td>
</tr>
<tr>
<td><strong>(min – max)</strong></td>
<td>1-4</td>
<td>150-180</td>
<td>0-65</td>
<td>0-62</td>
<td>0-100</td>
<td>0-100</td>
</tr>
</tbody>
</table>

*Note.* Means and (Standard Errors). Term GPA: Freshman n = 796, Transfer Junior n = 181, Continuing Junior n = 270; CT: Freshman n = 421, Transfer Junior n = 94, Continuing Junior n = 75; Hours Studying: Freshman n = 292, Transfer Junior n = 92, Continuing Junior n = 64; Non-lecturing/Groupwork: Freshman n = 281, Transfer Junior n = 89, Continuing Junior n = 64; Counselor: Freshman n = 585, Transfer Junior n = 159, Continuing Junior n = 117.
## Civic Online Reasoning & Civic Attitudes

<table>
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<tbody>
<tr>
<td>Freshmen</td>
<td>-.05</td>
<td>62</td>
<td>46</td>
<td>70</td>
<td>40%</td>
<td>27%</td>
<td>13%</td>
</tr>
<tr>
<td></td>
<td>(.05)</td>
<td>(.75)</td>
<td>(1.19)</td>
<td>(.97)</td>
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<tr>
<td>Transfer Juniors</td>
<td>.16</td>
<td>62</td>
<td>51</td>
<td>72</td>
<td>51%</td>
<td>38%</td>
<td>26%</td>
</tr>
<tr>
<td></td>
<td>(.11)</td>
<td>(1.66)</td>
<td>(2.33)</td>
<td>(1.97)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Cont. Juniors</td>
<td>.06</td>
<td>61</td>
<td>52</td>
<td>71</td>
<td>48%</td>
<td>28%</td>
<td>13%</td>
</tr>
<tr>
<td></td>
<td>(.11)</td>
<td>(1.89)</td>
<td>(2.73)</td>
<td>(2.13)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>First Generation</td>
<td>-.10</td>
<td>62</td>
<td>47</td>
<td>71</td>
<td>39%</td>
<td>26%</td>
<td>13%</td>
</tr>
<tr>
<td></td>
<td>(.05)</td>
<td>(.88)</td>
<td>(1.32)</td>
<td>(1.09)</td>
<td></td>
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</tr>
<tr>
<td>Not First Gen.</td>
<td>.12</td>
<td>62</td>
<td>48</td>
<td>70</td>
<td>47%</td>
<td>33%</td>
<td>18%</td>
</tr>
<tr>
<td></td>
<td>(.06)</td>
<td>(.95)</td>
<td>(1.50)</td>
<td>(1.20)</td>
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<td></td>
</tr>
<tr>
<td>(min – max)</td>
<td>(0 - 100)</td>
<td>(0 - 100)</td>
<td>(0 - 100)</td>
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</tbody>
</table>

**Note.** Civic Online Reasoning tasks (Wineburg et al. @ SHEG): standardized average over 6 scores (2 tasks, 3 raters; each scored from 0 to 2; $N = 595$). Civic Online Reasoning Rubric Split: Mastery = 17%; Emerging = 38%; Beginning = 45%. Survey Items ($N = 864$). Political Positioning "How would you characterize your political views?" (0 = Completely Conservative; 100 = Completely Liberal); Political Decisions "How important is it to you to influence political decisions?"; Societal/Environ. Problems "How important is it to you to contribute to solving problems in society or the environment?" (0 = Not at all important; 100 = Most important); Political Affairs "How often do you intentionally keep up-to-date with political affairs and events?"; Liberal/Conservative News "How often do you seek news from liberal/conservative news outlets?" (0 = Once a month or less; 1 = Once a week or more). Mean (S.E.). Freshmen – Civic Online Reasoning $n = 426$; Survey $n = 584$. Transfer Juniors – Civic Online Reasoning $n = 95$; Survey $n = 163$. Continuing Juniors – Civic Online Reasoning $n = 74$; Survey $n = 117$. The Civic Online Reasoning score was standardized (mean = 0; standard deviation = 1).
How much do you believe that the following sources are trustworthy?

<table>
<thead>
<tr>
<th>Source</th>
<th>Freshmen</th>
<th>Transfer Juniors</th>
<th>Continuing Juniors</th>
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</thead>
<tbody>
<tr>
<td>CNN</td>
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<td>Fox News</td>
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<td>NYT</td>
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<td>WaPo</td>
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<td>Daily Show</td>
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<td>Tucker</td>
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<td>WSJ</td>
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</tbody>
</table>

Note. Question asked during Week 3 of Fall 2019. N = 283; Freshmen n=198; Transfer Juniors n=56; Continuing Juniors n=29.

Not at all trustworthy (= 0) / Extremely trustworthy (= 100)
Next Steps and Measurement Dissemination

• Expand the study longitudinally and with new cohorts

• Move from descriptive results to multivariate analysis that will generate project findings on educational value and support institutional improvement efforts

• Scale use/disseminate new measures through collaborations with external partners
  
  • Gardner Institute – enhance data driven improvement efforts in broad access institutions
  
  • University of Michigan – College and Beyond II
  
  • International Researcher Convening – UCI, June 8-9, 2020
richard.arum@uci.edu