Postcollegiate Outcomes Research: Joining Pieces of the Pathways Puzzle

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University of Minnesota Institutional Research

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UNIVERSITY OF MINNESOTA
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Presentation Overview

- Project scope and data highlights
- Working with outcomes data—National Student Clearinghouse and state employment data files
- Employment and further education data—focus on liberal arts majors
- Next steps, lessons learned

We had so many questions…..as do our legislators, parents, students, and accreditors

Where are our graduates working?

How much are they making? By field? By degree level?
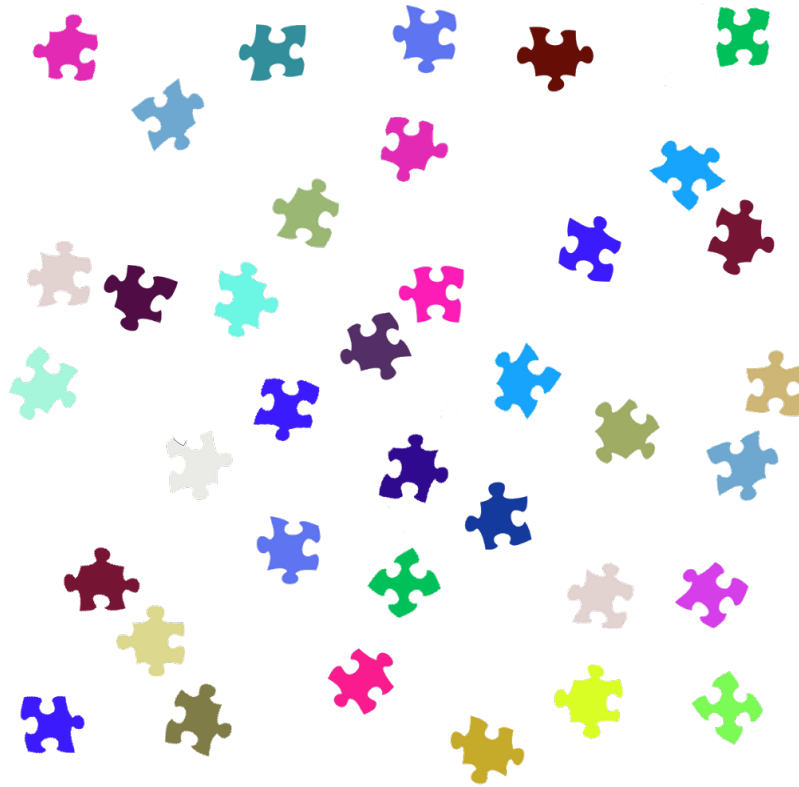
Are they in fields related to their major?

How do occupations change over time?

Is the U of M an equalizer for students who come from lower socioeconomic backgrounds?

What does further education look like?

What are the personal and social capital gains of U of M graduates?

What we had….

Each campus and many of the colleges in the Twin Cities doing their <u>own</u> thing…..

U of M Postcollegiate Outcomes Project

- Longer time horizon: 5, 10+ years out—beyond placement
- Systematic approach: system-wide and across all student levels
- Primary data sources—non-surveys, non-self-reported

Better and broader data sources now available….still not complete

Current data sources

- **Statewide Longitudinal Education Data System (SLEDS)** – MN Unemployment Insurance info: salary, industry and sector of employment, & hours worked by quarter
- **National Student Clearinghouse** – pursuit of additional education, including and beyond just UMN
- University of MN internal data warehouse tables

Data Overview

How did UM graduates appear in SLEDS?

- UMN completers' unique students (2006-16): 140,625 from central records vs. 137,968 from SLEDS: **Missing 1.89%**

- Any SLEDS employment data: n=124,721: 124,721/137,968 = **90.4%**

- Any SLEDS employment data 1 year after graduation: 105,181/137,968 **= 76.2%**

SLEDS Example: Percentage of UMN Graduates Employed* in Minnesota

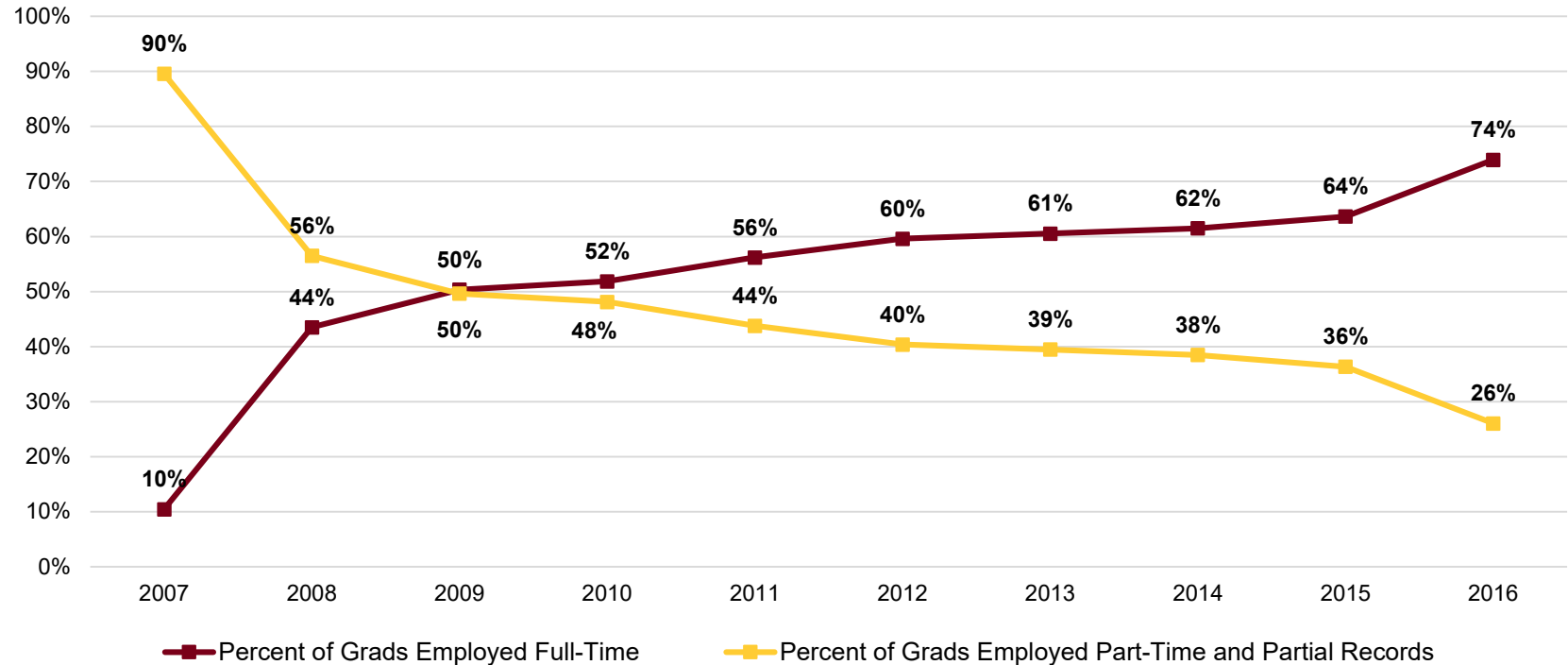## Cohort of Students Tracked Over Time Systemwide: Baccalaureate, 2007, *N* = 8,341
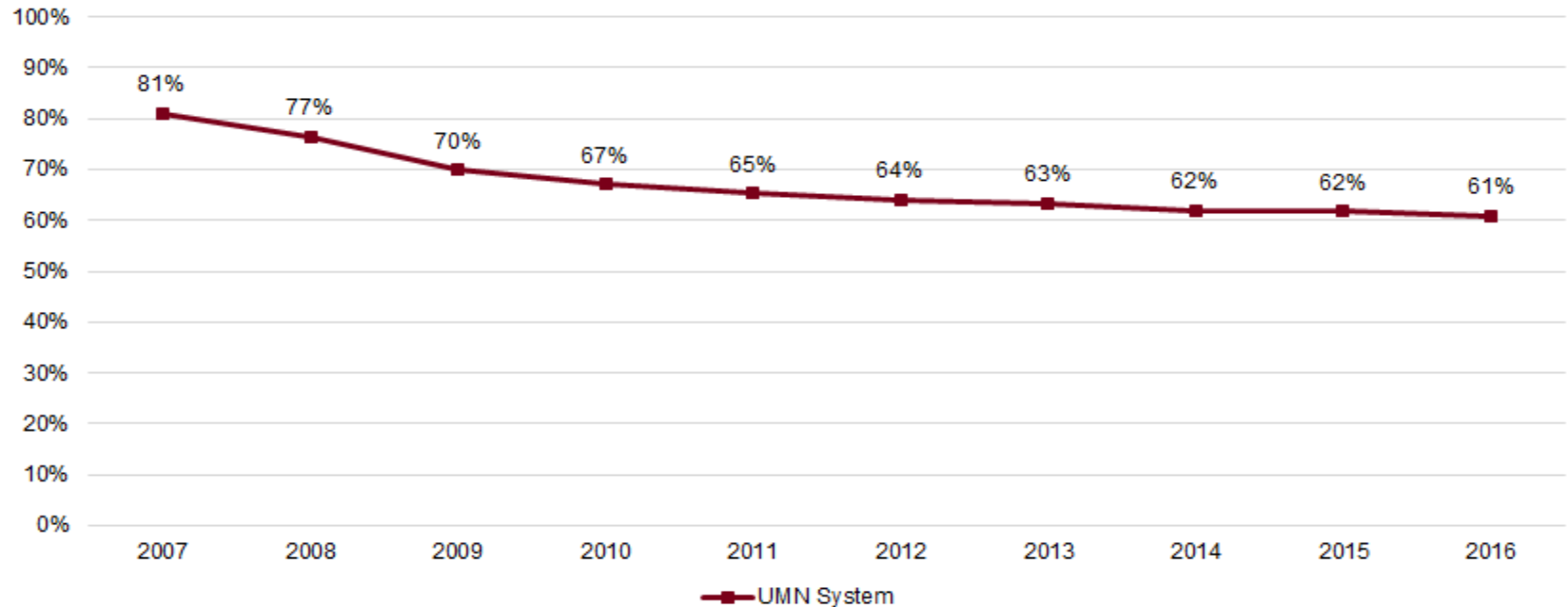
*Number who had any salary data: Outcomes represent only the graduates who worked in Minnesota as identified in the state's Unemployment Insurance wage records.

Note. UMN Rochester campus, whose first graduating cohort was in 2013, is not included.

SLEDS: Percentage of UMN Graduates Employed in Minnesota: Of those Employed: % Full-Time vs Part-Time

Cohort of Students Tracked Over Time Systemwide: Baccalaureate, 2007, *N* = 8,341

Percent of Grads Employed Full-Time:
- 2007: 10%
- 2008: 44%
- 2009: 50%
- 2010: 52%
- 2011: 56%
- 2012: 60%
- 2013: 61%
- 2014: 62%
- 2015: 64%
- 2016: 74%

Percent of Grads Employed Part-Time and Partial Records:
- 2007: 90%
- 2008: 56%
- 2009: 50%
- 2010: 48%
- 2011: 44%
- 2012: 40%
- 2013: 39%
- 2014: 38%
- 2015: 36%
- 2016: 26%

Legend: —■— Percent of Grads Employed Full-Time   —■— Percent of Grads Employed Part-Time and Partial Records
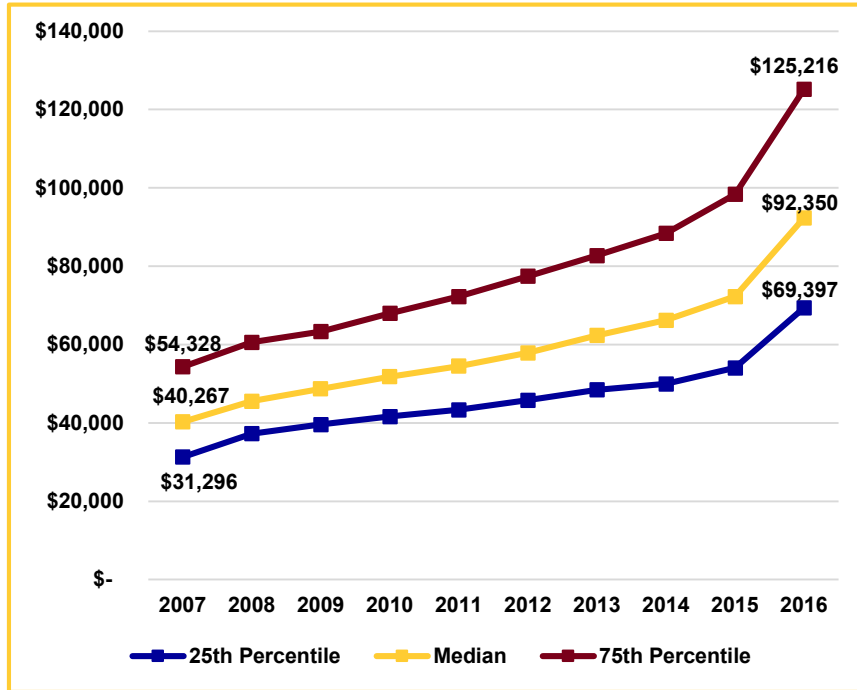
Note. UMN Rochester campus, whose first graduating cohort was in 2013, is not included.
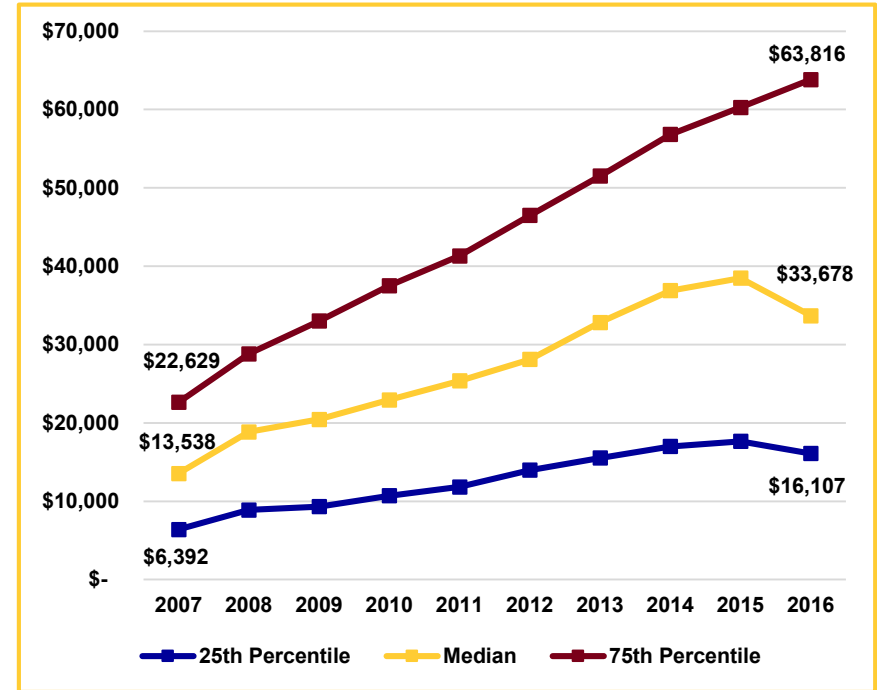
SLEDS: UMN Alumni Earnings Over Time (2007-2016)

Cohort of Students Tracked Over Time Systemwide: Baccalaureate, 2007, *N* = 8,341

Full-Time

Part-Time

Note. UMN Rochester campus, whose first graduating cohort was in 2013, is not included.

Earnings are based on a calendar year and are inflation-adjusted to reflect 2020 dollars.

Example Clearinghouse: Further Education: UMN System
Degree Received: Baccalaureate, 2007, N = 8,341

- **35%** or **2,939** graduates received additional degrees/certificates between **2007-2016**

298   25   3

2,613

5,402

■ No Further Education   ■ One Degree/Certificate

■ Two Degrees/Certificates   ■ Three Degrees/Certificates
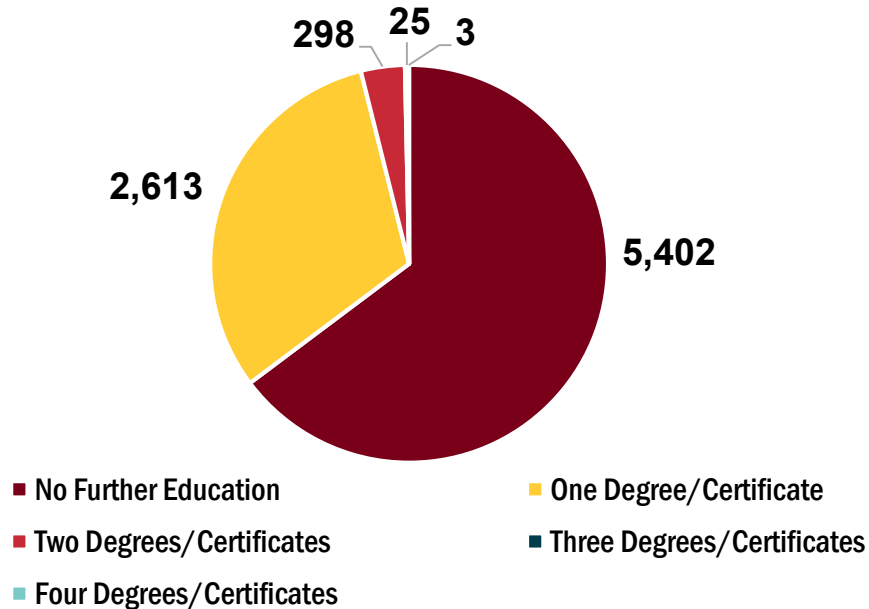
■ Four Degrees/Certificates

Example Clearinghouse: Further Education: UMN System
Degree Received: Baccalaureate, 2007, *N* = 8,341

- Of the 35%, **33% received an additional degree/certificate from the U of M and 2% from both the U of M and other institutions**

33%	2%	65%

■ UMN   ■ UMN and Other Institutions   ■ Other Institutions

Working with Employment and National Student Clearinghouse Data

SLEDS Data Files

Cohort based on all students enrolled at UM between Fall 2003 and Fall 2017

- **Enrollment File**: 1,390,266 rows, 343,665 unique ids
  - One row per person per MN institution and term of enrollment
  - Used primarily to validate the base cohort
- **Completers File** (degrees): 206,536 rows, 168,964 unique ids
  - One row per person per degree received – UM and other MN schools
  - Not very useful – limited information – opted to use NSC data instead
- **Employment File**: 9,770,134 rows, 298,456 unique ids
  - One row per person, per job, per quarter - for employees in MN eligible for UI
- **Re-Identification File**: 343,665 rows
  - Mapping assigned sleds_id back to UM student_id using probabilistic matching

National Student Clearinghouse

- National look at further enrollments of UMN enrollees (both transfer and graduate/professional study)

Submitted to NSC:

- Enrolled at UMN (Fall 2003-Fall 2017): **343,665**

- Batches of 50,000 (seven batches); later successfully used 100,000 batches

Received from NSC:

- 4,039,240 records (multiple rows per person, UMN+non-UMN) of which:

  - 1,798,332 records (multiple rows per person, non-UMN) of which:

    - unique headcount graduated (non-UMN): 115,423

Challenges of Working with NSC Data

Use of non-standardized *institution-specific* definitions:

- Award level: **3,777** different **credential titles:**
- Variations in abbreviations, names, punctuation
- Institution-specific programs
  - **BAMA** = Master's degree (B.A./M.A. program at NYU and CUNY, which satisfies all of the requirements of both the bachelor's degree and the master's degree and culminates in an M.A.)

    ND = Doctoral-professional degree (Doctor of Naturopathic Medicine)

    Advanced Standing Diploma = Undergraduate certificate

    Engineer = Postmaster's certificate (Ivy League Universities)

    Credential (20 entries) can mean a range of award levels, depending on the institution (e.g. Postmaster's certificate in a medical field, Subbaccalaureate certificate at a community college)

    Certificate (about *10,000* entries) can mean a range of award levels, depending on the institution (e.g. Postmaster's, Postbaccalaurete, and Subbaccalaureate certificates)

Challenges of Working with NSC Data

- Use of non-standardized *institution-specific* definitions:
  - Program name (NSC Degree Major):
  - e.g., "SPEC ED EMOT BEHAVIOR DISORDER, ACAD BEHAVIORAL STRATEGIST, BIG DATA"
- Standardized government definitions/codes not provided:
  - CIP codes: a mix of 2000 and 2010
- Detailed documentation not provided (data dictionary, etc.)
- Needed *manual* data cleaning to standardize
  - To determine IPEDS definitions of degree level & program title: look at the institution degree title, program name, CIP code, and *check the website of an institution.*

Data Preparation Steps

- Initial Review of Data – using Ultra Edit
  - Able to sort and select NSC degree records only (enrollment info not needed at this point)
  - Scan data to verify layout and check for abnormalities.
- Upload all files to Oracle data base tables using TOAD
  - Insert original UM student_id into all tables by matching on SLEDS student_id in the reidentification file
    - Created by SLEDS using probabilistic matching (name, birthdate, etc.)
    - Contained some errors including multiple UM_student_id values per sleds_id and vice versa.
    - Corrected on our end via Oracle SQL to get a final 1-1 mapping using random selections

Data Transformation Steps

Use Oracle SQL to merge & manipulate tables

- UM files, SLEDS files, NSC files

- Create Tableau-friendly "vertical" file format (e.g. one row per person, per degree year per employment year)

- Roll up original salary data was from quarter level – to calendar year level

- Complexity - calculating salary data to accurately restart amounts with each degree a student received

- Create final single year cohort file of those who received a UM bachelors degree in calendar 2007 so they could be followed forward.

Postgraduation Outcomes of UMTC Liberal Arts Graduates

Further Education and Career: English and Psychology

Further Education
English Language and Literature, General
Degree Received: Baccalaureate, 2007, *N* = 193

38% (74* graduates) received additional degrees/certificates between **2007-2016**

- No Further Education
- One Degree/Certificate After Graduation
- Two Degrees/Certificates After Graduation
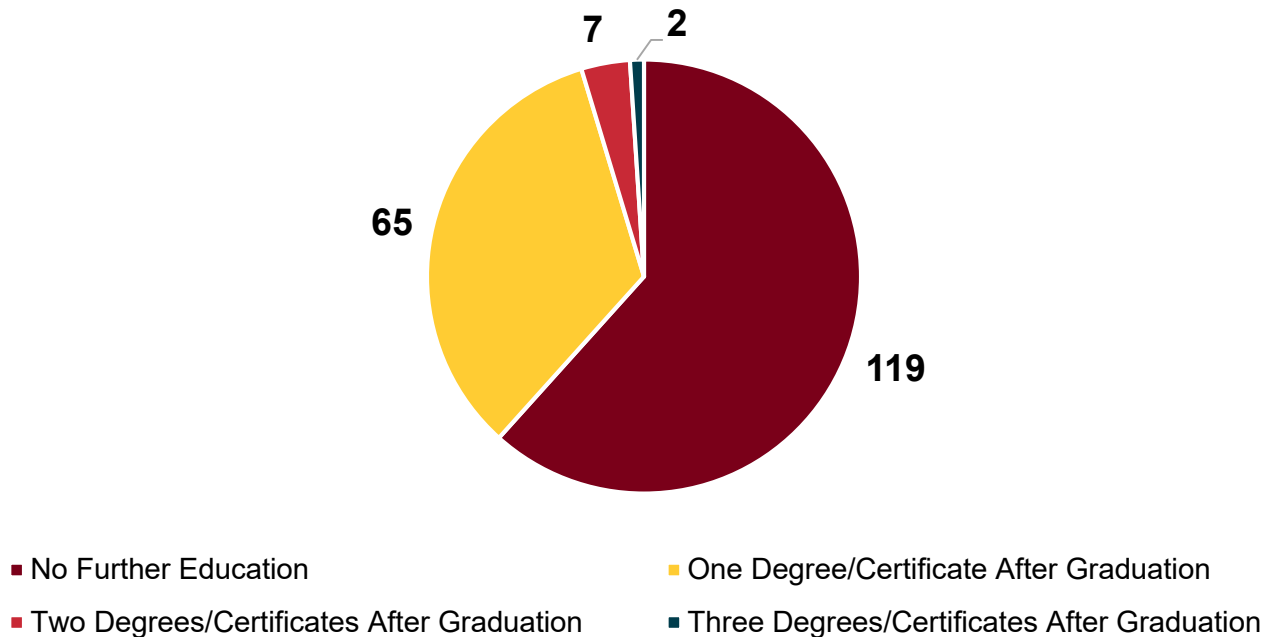- Three Degrees/Certificates After Graduation

Further Education
English Language and Literature, General
Degree Received: Baccalaureate, 2007, *N* = 193

74* graduates received additional degrees/certificates between **2007-2016**

30%	2%	68%

■ UMN   ■ UMN and Other Institutions   ■ Other Institutions

English Language and Literature, General
Further Education, n = 74

Certificate/Degree	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Undergraduate Certificate	1			2		2	1			**6**
Associate Degree				2			2	1	1	**6**
Baccalaureate Degree			1	1	1	2				**5**
Postbaccalaureate Certificate					1					**1**
Master's Degree		3	9	11	4	9	5	3	7	**51**
Doctoral-Professional Degree			4	4	1	3	2		1	**15**
Doctoral-Research Degree								1		**1**
Total	**1**	**3**	**14**	**20**	**7**	**16**	**10**	**5**	**9**	**85***

*Count of degrees/certificates

Further Education
English Language and Literature, General
n = 74; 85 total awards

Major Fields

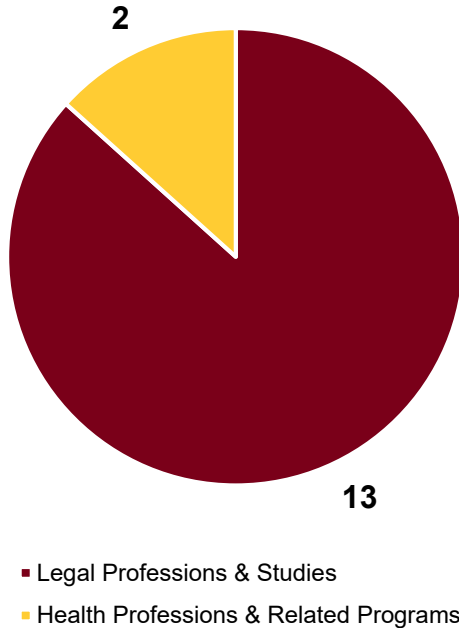| Major Field	Count
EDUCATION	23
LEGAL PROFESSIONS AND STUDIES	14
HEALTH PROFESSIONS AND RELATED PROGRAMS	14
ENGLISH LANGUAGE AND LITERATURE/LETTERS	7
BUSINESS, MANAGEMENT, MARKETING, AND RELATED SUPPORT…	7
LIBRARY SCIENCE	6
THEOLOGY AND RELIGIOUS VOCATIONS	3
PUBLIC ADMINISTRATION AND SOCIAL SERVICE PROFESSIONS	3
COMPUTER AND INFORMATION SCIENCES AND SUPPORT SERVICES	2
SOCIAL SCIENCES	1
PSYCHOLOGY	1
MULTI/INTERDISCIPLINARY STUDIES	1
LIBERAL ARTS AND SCIENCES, GENERAL STUDIES AND HUMANITIES	1
FOREIGN LANGUAGES, LITERATURES, AND LINGUISTICS	1
AGRICULTURAL/ANIMAL/PLANT/VETERINARY SCIENCE AND…	1

*Count of degrees/certificates

Further Education
English Language and Literature, General
n = 74; 85 total awards

Doctoral-Professional Degrees, n = 15

- Legal Professions & Studies
- Health Professions & Related Programs

Master's Degrees, n = 51

- Education
- English Language & Literature/Letters
- Library Science
- Business, Management, Marketing, & Related Support Services
- Public Administration & Social Service Professions
- Health Professions & Related Programs
- Theology & Religious Vocations
- Legal Professions & Studies
- Liberal Arts & Sciences, General Studies & Humanities
- Multi/Interdisciplinary Studies
- Social Sciences

*Count of degrees/certificates

Employment
English Language and Literature, General
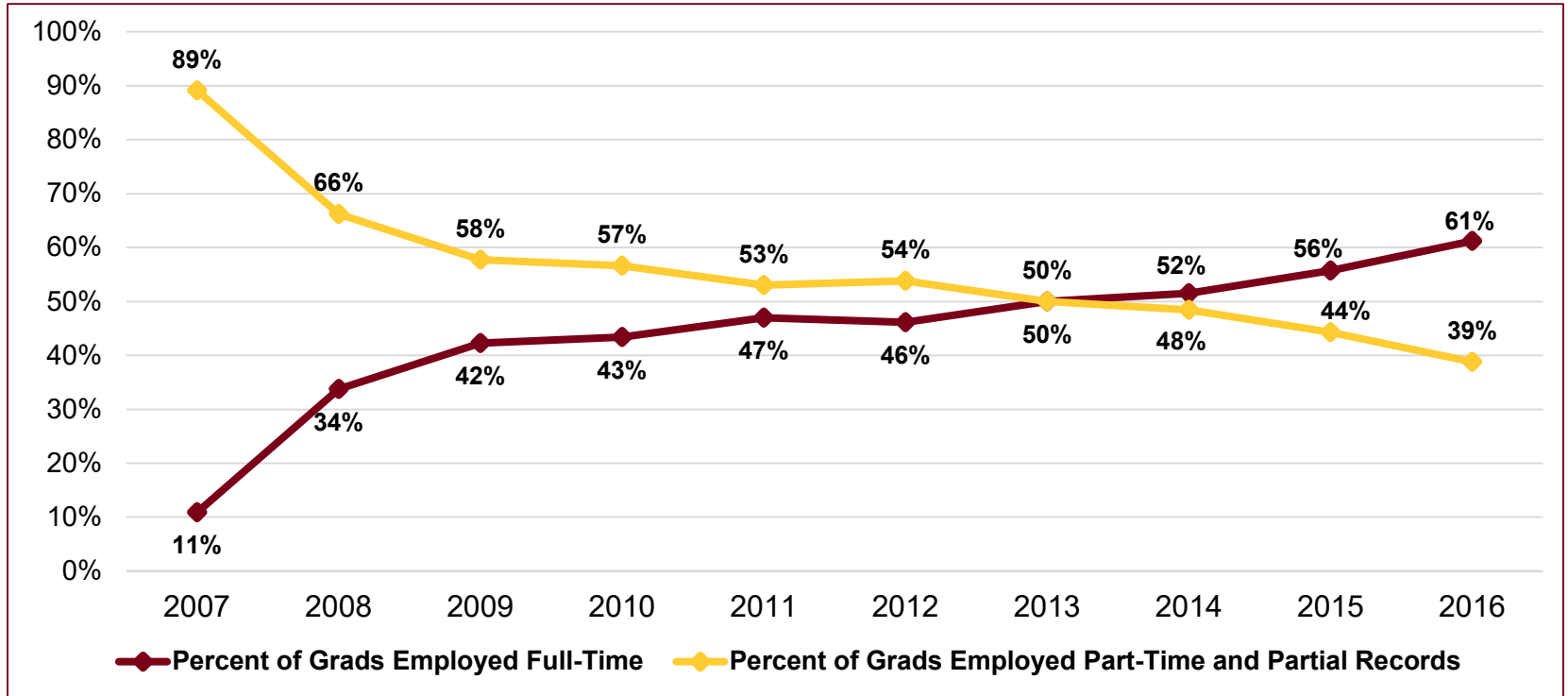
Degree Received: Baccalaureate, 2007 (academic year), *N* = 193

Percentage of Graduates Employed in Minnesota: Full-Time vs Part-Time

Year	Percent of Grads Employed Full-Time	Percent of Grads Employed Part-Time and Partial Records
2007	11%	89%
2008	34%	66%
2009	42%	58%
2010	43%	57%
2011	47%	53%
2012	46%	54%
2013	50%	50%
2014	52%	48%
2015	56%	44%
2016	61%	39%

● Percent of Grads Employed Full-Time ● Percent of Grads Employed Part-Time and Partial Records

Employment
English Language and Literature, General
Degree Received: Baccalaureate, 2007 (academic year), *N* = 193
Earnings Over Time (2007-2016)

Full-Time Earnings

Earnings are based on a calendar year and are inflation-adjusted to reflect 2020 dollars.
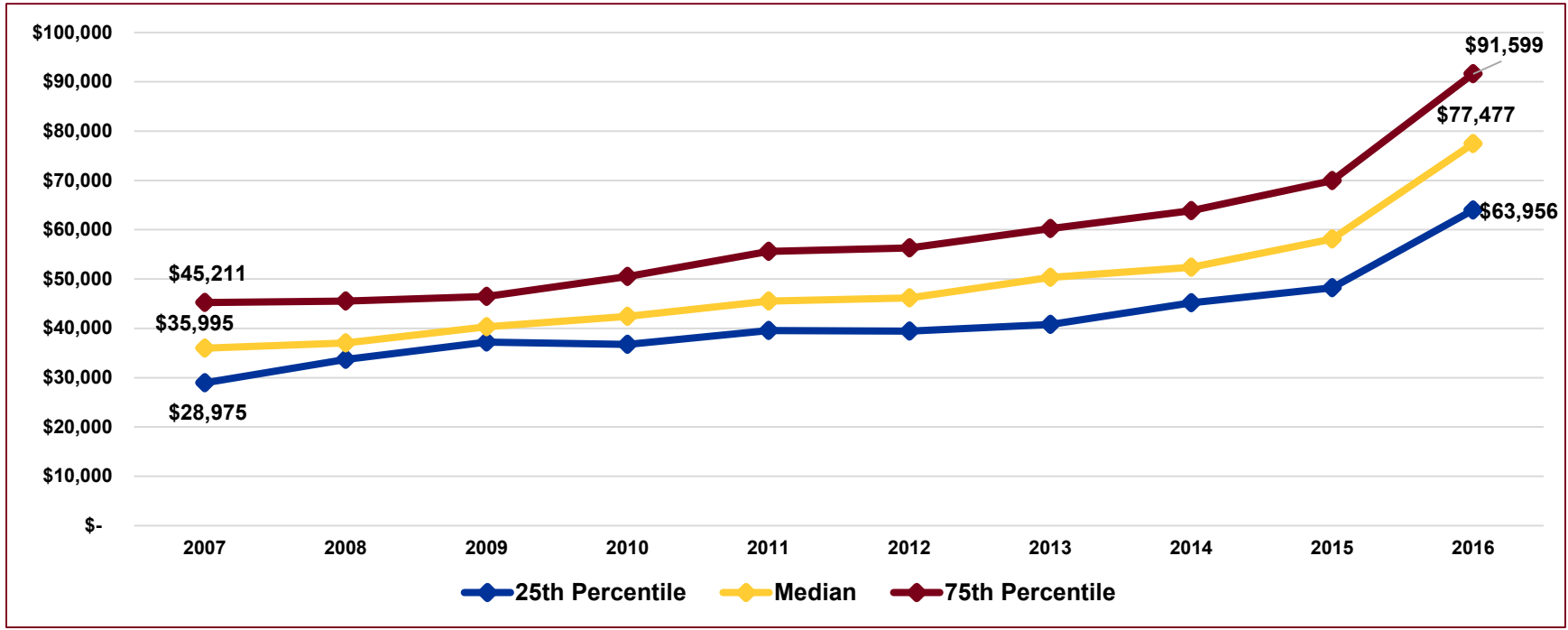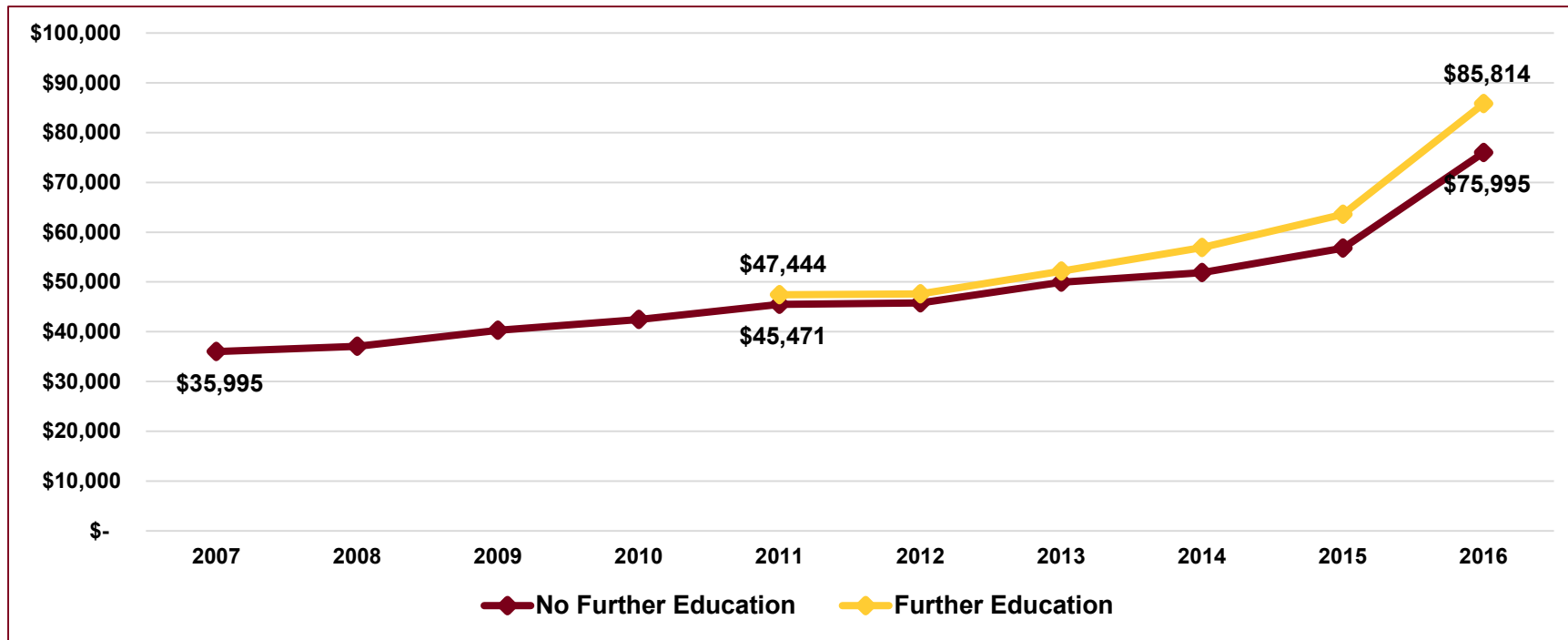
Employment
English Language and Literature, General
Degree Received: Baccalaureate, 2007 (academic year), *N* = 193
Earnings Over Time (2007-2016)
Median Full-Time Earnings

Legend: No Further Education, Further Education

$85,814
$75,995
$47,444
$45,471
$35,995

Earnings are based on a calendar year and are inflation-adjusted to reflect 2020 dollars.

Further Education
Psychology, General
Degree Received: Baccalaureate, 2007, *N* = 377

48% (182* graduates) received additional degrees/certificates between **2007-2016**
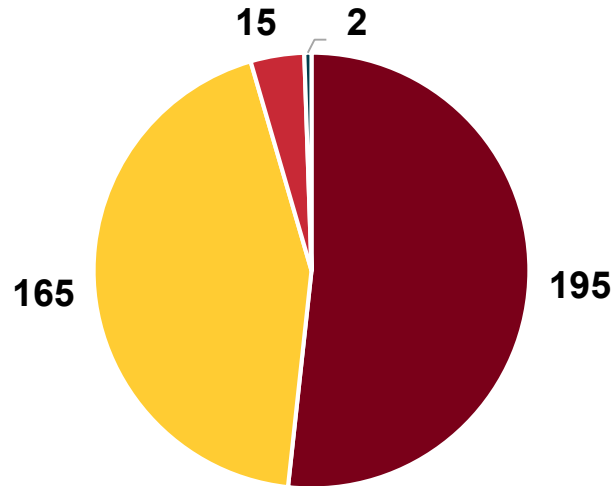
15   2

165   195

- No Further Education
- One Degree/Certificate After Graduation
- Two Degrees/Certificates After Graduation
- Three Degrees/Certificates After Graduation

*Count of graduates

Further Education
Psychology, General
Degree Received: Baccalaureate, 2007, *N* = 377

182* graduates received additional degrees/certificates between **2007-2016**

29%	71%

■ UMN   ■ Other Institutions

Psychology, General
Further Education
n = 182

Certificate/Degree	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Undergraduate Certificate	1	1	1						1	**4**
Associate Degree	1	2	1		2		3			**9**
Baccalaureate Degree		1			2		1		2	**6**
Postbaccalaureate Certificate			1	3		3	2			**9**
Master's Degree	2	21	30	25	15	17	14	8	7	**139**
Postmaster's Certificate						1			1	**2**
Doctoral-Professional Degree			6	6	2	4	2	1	1	**22**
Doctoral-Research Degree						1	1	2	5	**9**
Total	**4**	**25**	**39**	**34**	**21**	**26**	**23**	**11**	**17**	**200***

*Count of degrees/certificates

Further Education
Psychology, General
n = 182; 200 total awards

Major Fields

Major Field	Count
PSYCHOLOGY	56
HEALTH PROFESSIONS AND RELATED PROGRAMS	49
BUSINESS, MANAGEMENT, MARKETING, AND RELATED SUPPORT SERVICES	27
EDUCATION	23
PUBLIC ADMINISTRATION AND SOCIAL SERVICE PROFESSIONS	17
LEGAL PROFESSIONS AND STUDIES	12
HOMELAND SECURITY, LAW ENFORCEMENT, FIREFIGHTING AND RELATED PROTECTIVE...	3
BIOLOGICAL AND BIOMEDICAL SCIENCES	3
SOCIAL SCIENCES	2
COMPUTER AND INFORMATION SCIENCES AND SUPPORT SERVICES	2
MULTI/INTERDISCIPLINARY STUDIES	1
FOREIGN LANGUAGES, LITERATURES, AND LINGUISTICS	1
FAMILY AND CONSUMER SCIENCES/HUMAN SCIENCES	1
ENGLISH LANGUAGE AND LITERATURE/LETTERS	1
ENGINEERING	1
ARCHITECTURE AND RELATED SERVICES	1

*Count of degrees/certificates

Further Education
Psychology, General
n = 182; 200 total awards

Major Field: Psychology, n = 56

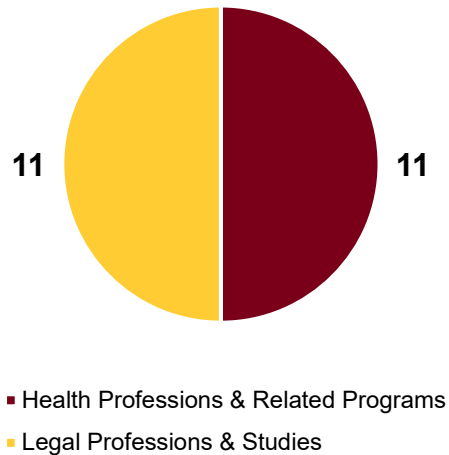| Field	Count
Counseling Psychology	21
Psychology, General	11
Educational Psychology	8
Industrial and Organizational Psychology	6
School Psychology	3
Clinical Psychology	3
Social Psychology	1
Health/Medical Psychology	1
Forensic Psychology	1
Experimental Psychology	1

*Count of degrees/certificates

Further Education
Psychology, General
n = 182; 200 total awards

### Doctoral-Professional Degrees, *n* = 22

- Health Professions & Related Programs — 11
- Legal Professions & Studies — 11

Master's Degrees, *n* = 139

46, 27, 19, 19, 17, 3

- Psychology
- Business, Management, Marketing, & Related Support Services
- Education
- Health Professions & Related Programs
- Public Administration & Social Service Professions
- Biological & Biomedical Sciences
- Computer & Information Sciences & Support Services
- Architecture & Related Services
- Engineering
- English Language & Literature/Letters
- Family & Consumer Sciences/Human Sciences
- Homeland Security, Law Enforcement, Firefighting & Related Protective Services
- Social Sciences

*Count of degrees/certificates

Employment
Psychology, General
Degree Received: Baccalaureate, 2007 (academic year), *N* = 377
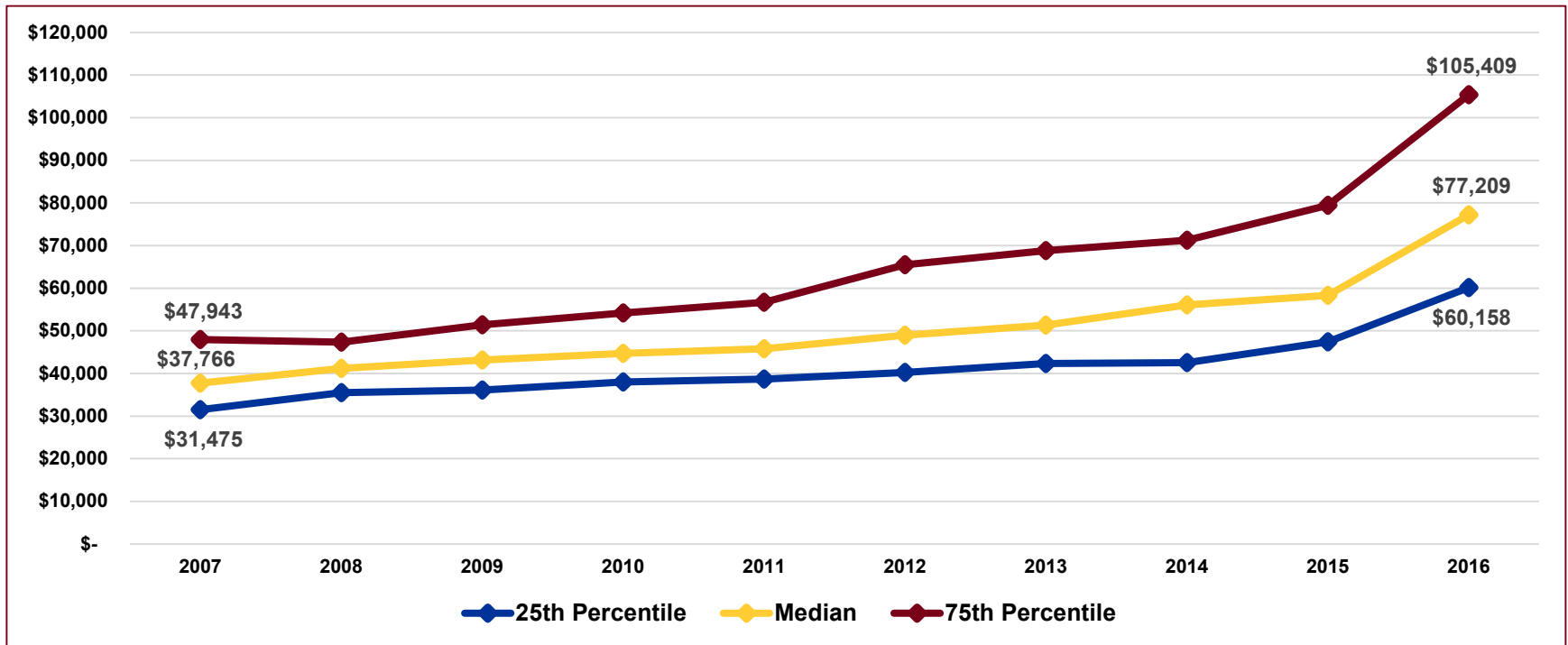**Percentage of Graduates Employed in Minnesota: Full-Time vs Part-Time**
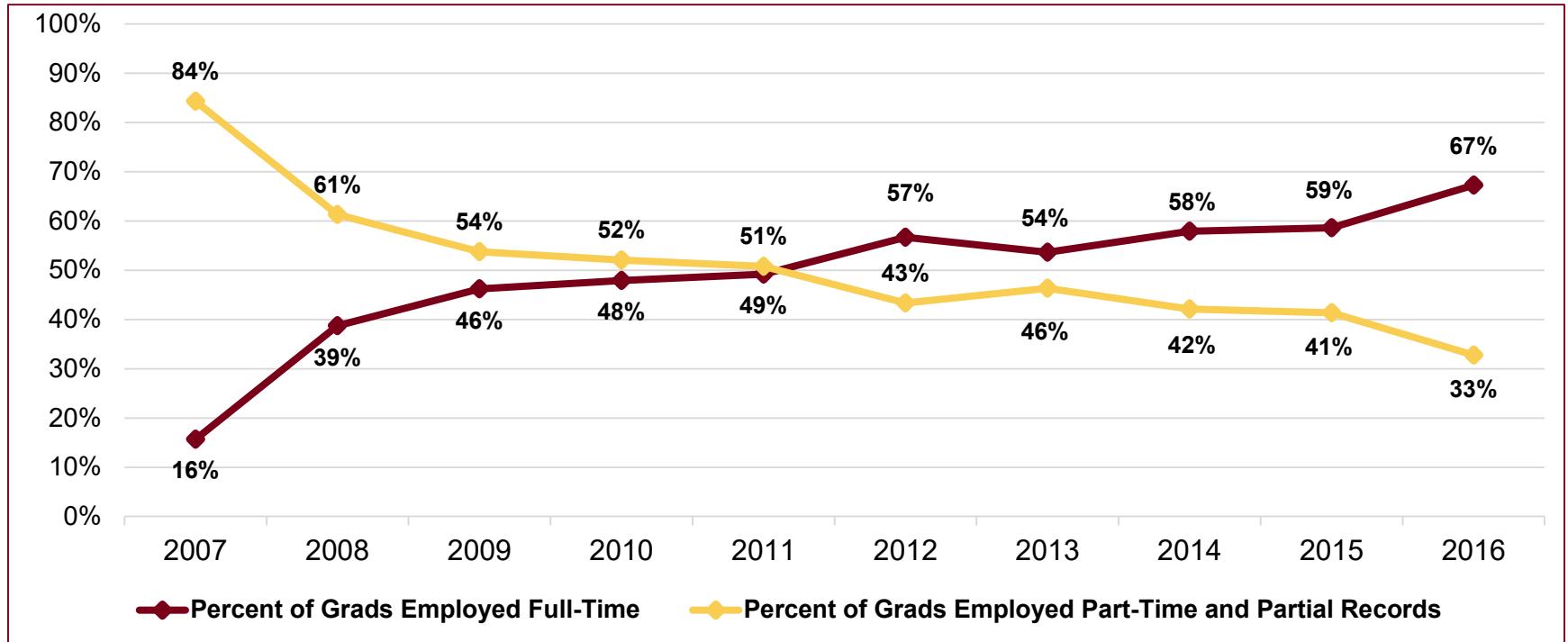
Employment
Psychology, General
Degree Received: Baccalaureate, 2007 (academic year), *N* = 377
Earnings Over Time (2007-2016)
Full-Time Earnings

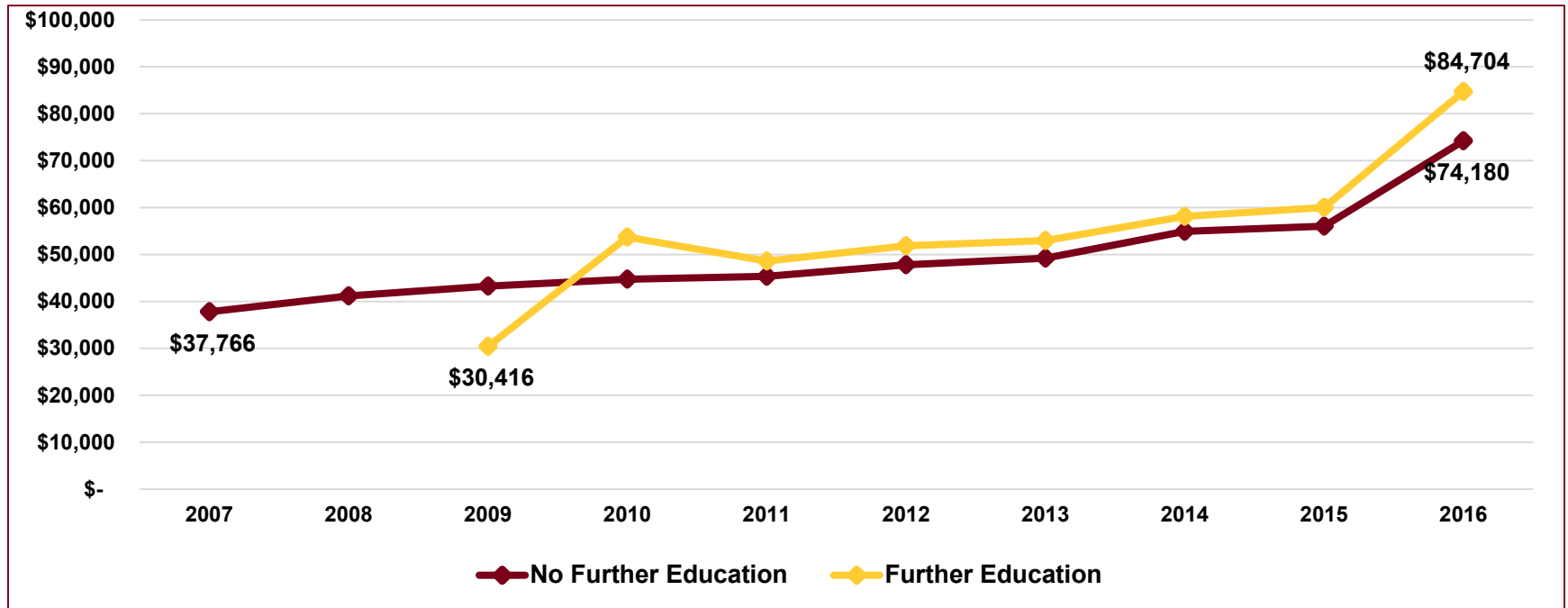**Earnings are based on a calendar year and are inflation-adjusted to reflect 2020 dollars.**

Employment
Psychology, General
Degree Received: Baccalaureate, 2007 (academic year), *N* = 377
Earnings Over Time (2007-2016)

Median Full-Time Earnings

Legend: No Further Education, Further Education

Data points labeled: $37,766 (2007), $30,416 (2009), $84,704 (2016), $74,180 (2016)

Earnings are based on a calendar year and are inflation-adjusted to reflect 2020 dollars.

Project Next Steps, Lessons Learned

Postcollegiate Outcomes on Campus

- Raising project awareness
  - Senior leadership, system campuses, units across campus
  - Integrating with new systemwide strategic plan
  - Coordinating with other initiatives
    - Expansion of longitudinal alumni outcome survey; effort to focus interests beyond salary
- Data Governance
  - Access, level of aggregation
- Distribution and Usability of Results
  - Working with campus groups

Postcollegiate Outcomes Next Steps

- Updating current data sources
  - SLEDS (2006-19, Q1 2020 UI records): includes expanded employer data, industry, sector; employee location by county
  - Census Bureau's Longitudinal Employer-Household Dynamics, Post-Secondary Employment Outcomes project
    - Coordinated by state Office of Higher Education
    - Provide national view
    - Potential availability for Minnesota in spring/summer 2022
- Further research questions
  - Outcomes for different student demographic groups
  - Time series analysis: accumulation of other degrees, shift to full-time employment

Discussion and Lessons Learned

- Working with non-standardized data from NSC
- Dealing with sensitivity of data
- Promoting, if not ensuring, consistency across institutional reporting, definitions
- Preparing for broad range of outcomes, definitions of "success"
- Managing demand for data and reporting with capacity

Questions?

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