Does Graduate Training in the Social Sciences Prepare Students for Data Management and Sharing?

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Graduate Training in Social Science

- The main objective of a graduate program in the social sciences
  - Producing quality scholars and researchers
- What skills should a good researcher have?
- Curriculum provided by these graduate programs
  - Research methods
  - Professional development

What's missing?

- It is unclear whether graduate students are receiving training in data management or data sharing

- Social science researchers report not feeling satisfied with their training in data management (Johnke & Asher, 2012)
  - Primarily from on the job training
  - Minimal formal education
  - Unfamiliar with data services

Importance of Management and Sharing

- Propagation of scientific research
- Increasingly collaborative nature of research
- Issues of long term storage, loss of data, and reusability
- Importance of communicating research well in social sciences

"If you're not sharing your data, you're not doing good science"

- Data service professionals
- Ethical guidelines of many social science fields
  - Open access or release of data
  - Emphasis on making data useable by others
- Examining the ethical codes
  - Six fields of social science

Examining the ethical codes

Additional Needs for Data Sharing and Management

- FAIR Data Principles (Wilkinson, *et al.*, 2016)
- Journals and funding sources such as the NIH, NSF (Tenopir, et al., 2011)
- Difference between public access and sharing by request

Research Questions

- As a crucial aspect of science, ethically required by the governing bodies, are students being taught data sharing or management as they prepare to become independent researchers?
  - Coursework in ethics relating to the governing body of the field
  - Specific inclusion of data sharing or management information
- Are students leaving their social science graduate programs with adequate skills in data sharing and data management?
  - Knowledge of repositories or how to use them
  - Are faculty confident in their abilities?

Methods

- Two part digital survey
  - 1- Program demographics and content
    - Inclusion of Ethics coursework
    - Research methods course work
    - Specific inclusion of data sharing or data management
    - Self assessment of program effectiveness
  - 2- Use of repositories and interest in repository programming
    - Why are and why might students use repositories

Sample

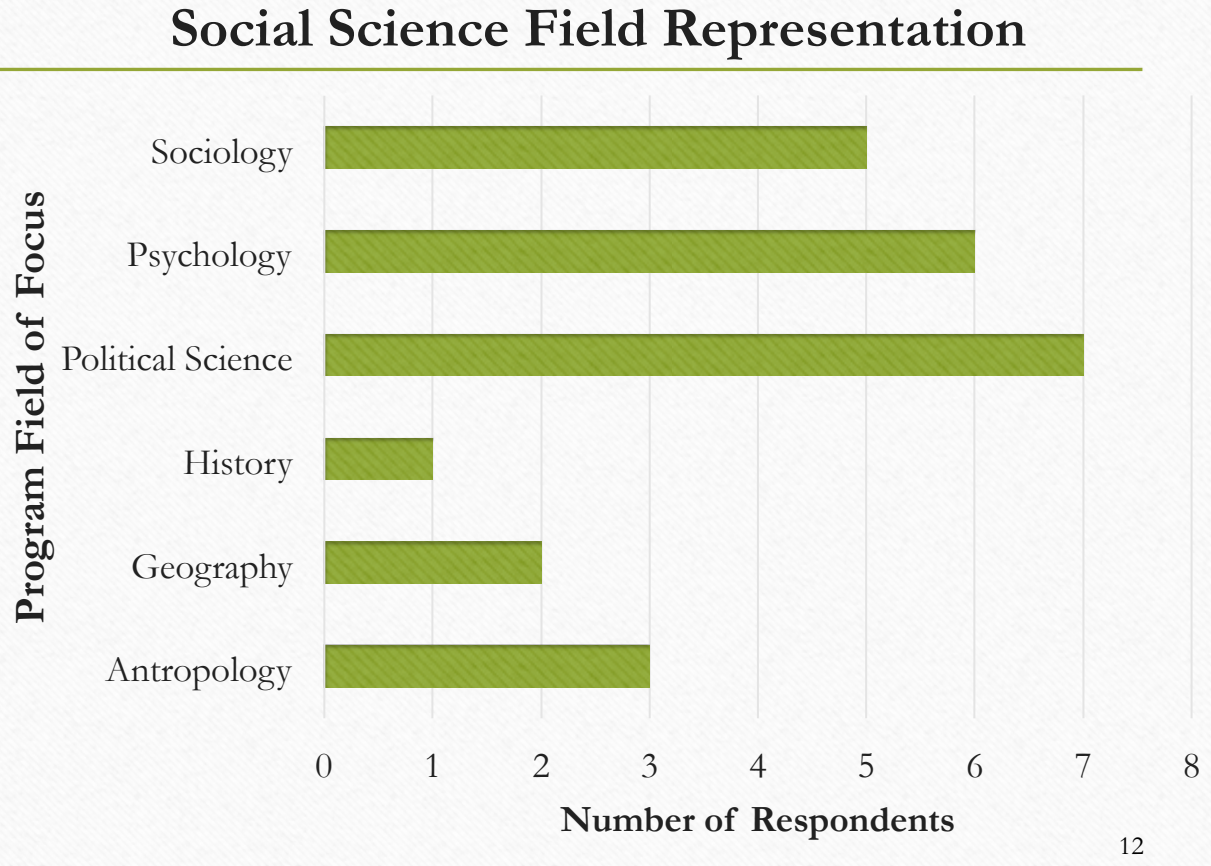
- Six fields selected
  - Inclusion criteria: Social science, Research oriented; Major governing body with an available code of ethics
- Random selection from US schools in the gradschools.com list
  - Only programs with in-person courses included
  - Respondents for schools selected using program website
- 150 of schools surveyed
  - Private and public
  - All Carnegie classification levels included, as well as unclassified
  - Within all 50 states

Preliminary Results

- Trends from the initial sample
- Small group sizes limited cross field comparisons
- Some limitations in sampling

Good science is sharing data

- Response Rates
  - Total response rate – 18%
    - Total of 24 usable responses
  - Response rates for each field
    - Anthropology – 12%
    - Geography – 8%
    - History – 4%
    - Political Science – 28%
    - Psychology – 24%
    - Sociology – 20%



Respondents

- Position of respondent
  - Program Coordinator (33.3%) or the Program Director (41.7%).
  - Other respondents
- Program size
  - Total number of students (n = 24) averaged 54.33 (sd = 75.61)
  - The number of full time faculty ranged from 2 to 35, with a median of 7.
- Degrees offered
  - 79.2% offer an MA
  - 20.8% offer an MS
  - 70.8% offer a PhD

Results: Research Methods

- 95.8% of programs reported a required research methods course
  - 70.8% (n = 22) also require students to complete a research project
- Statistical packages training
  - In 87.5% (n = 22) of programs a stats package is used in completing research
    - Most students use SPSS - 62.5%
    - STATA (50.0%), R (45.8%), SAS (29.2%)
  - Many programs allow students to choose which package they use (45.8%)
    - Only 16.7% require a specific package
- Adequacy of training in stats package use?
  - Reliance on undergraduate training or other experience

Results: Ethics in Research

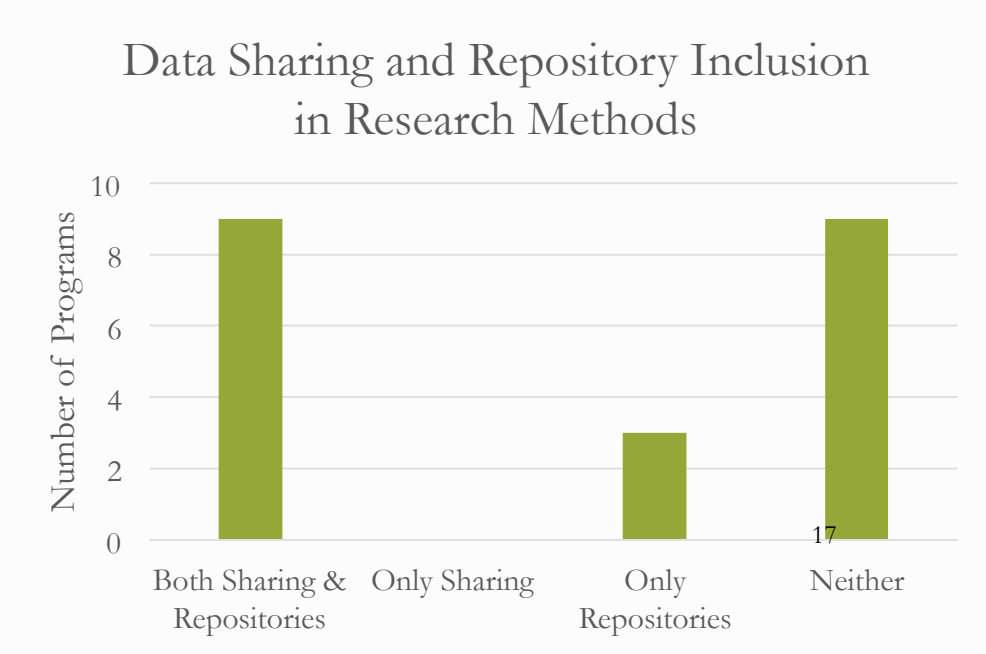
- Do programs provide discipline specific ethics training?
  - 20.8% (n = 24) of programs include an ethics course
    - Psychology programs included ethics courses more frequently than any other programs
  - 12.8% report ethics being incorporated into another course
  - Of those which include an ethics course:
    - 80% included material from the governing body/ethical code
    - 100% reviewed research ethics

Results: Data Management

- Inclusion of Data Management in program
  - Course in Data Management
    - Only 1 program reported providing a course specifically in data management (4.2%)
    - 2 programs reported a plan to offer one
  - Of those that do not offer a course in data management
    - Four report not providing information about data management in another way
    - Eight report not knowing if the information is shared at all
  - 75% of programs report data management being included in Research Methods

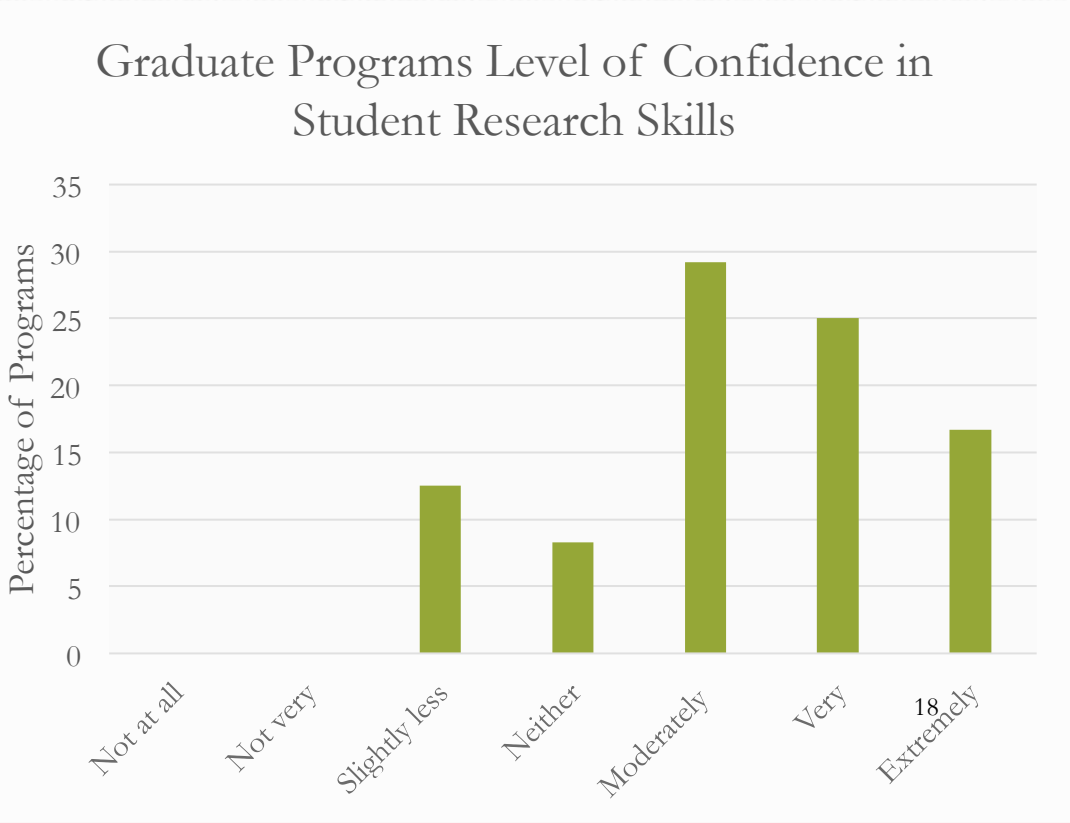
Results: Data Sharing

- Within the Research Methods course
  - 37.5% report covering data sharing
  - 12.5% report only covering repository information
- Specific repository content or access
  - 45.8% report that this information is covered in coursework
  - 4.2% give students this info to review independently
  - 41.7% do not cover information about repositories
- Inclusion of information some other way
  - Assistantships
  - Advisors



Results: Self assessment of program effectiveness

- Mean percentage of graduates working in research 57.18% (n = 22, sd = 26.14)
  - 62.5% spending either half or a minority of time working on research
- Majority of programs report feeling confident students have adequate research skills (66.7%)
  - 70.9% report feeling moderately to extremely confident



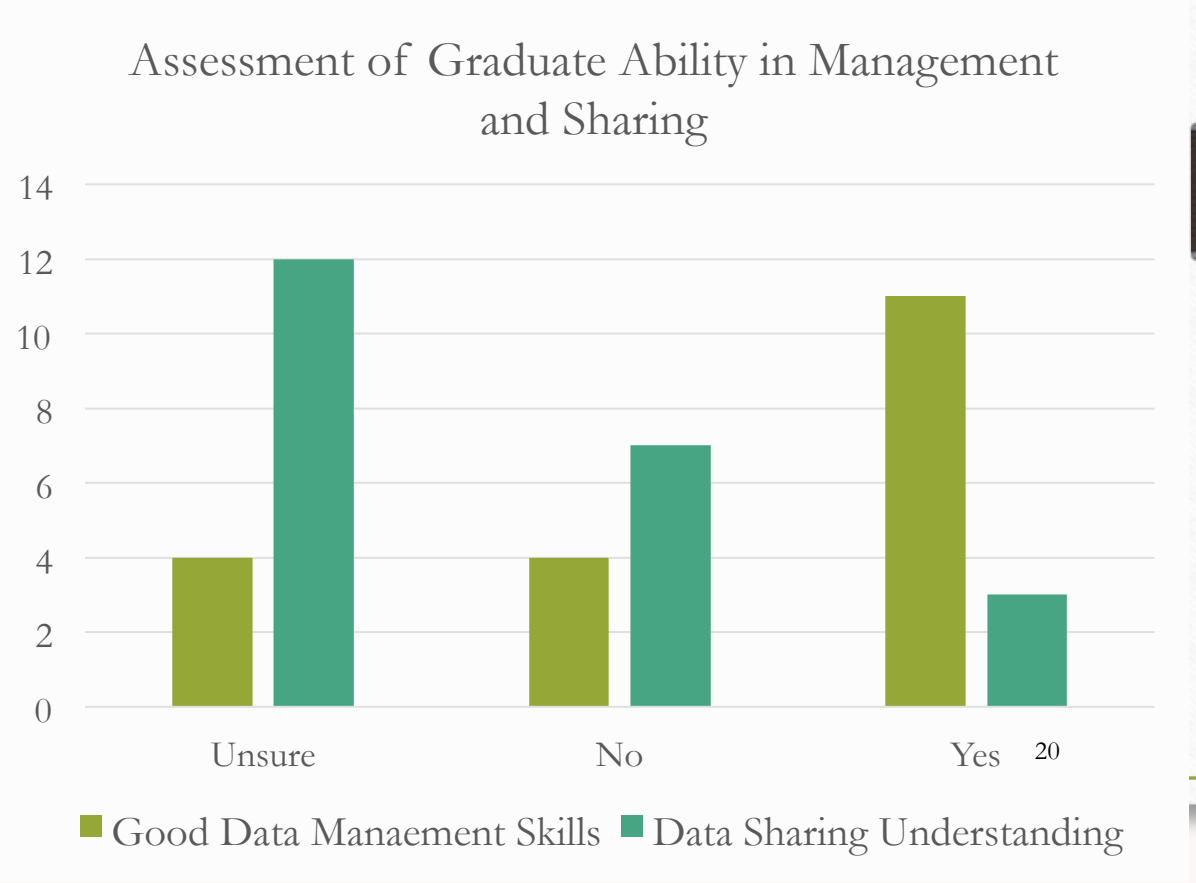
Results: Self assessment of program effectiveness

- Practical experience while in the program, on average
  - Publishing papers – 34% (alone); 41.6% (coauthor)
  - Presenting posters – 66.3%
  - Giving talks – 63.18%

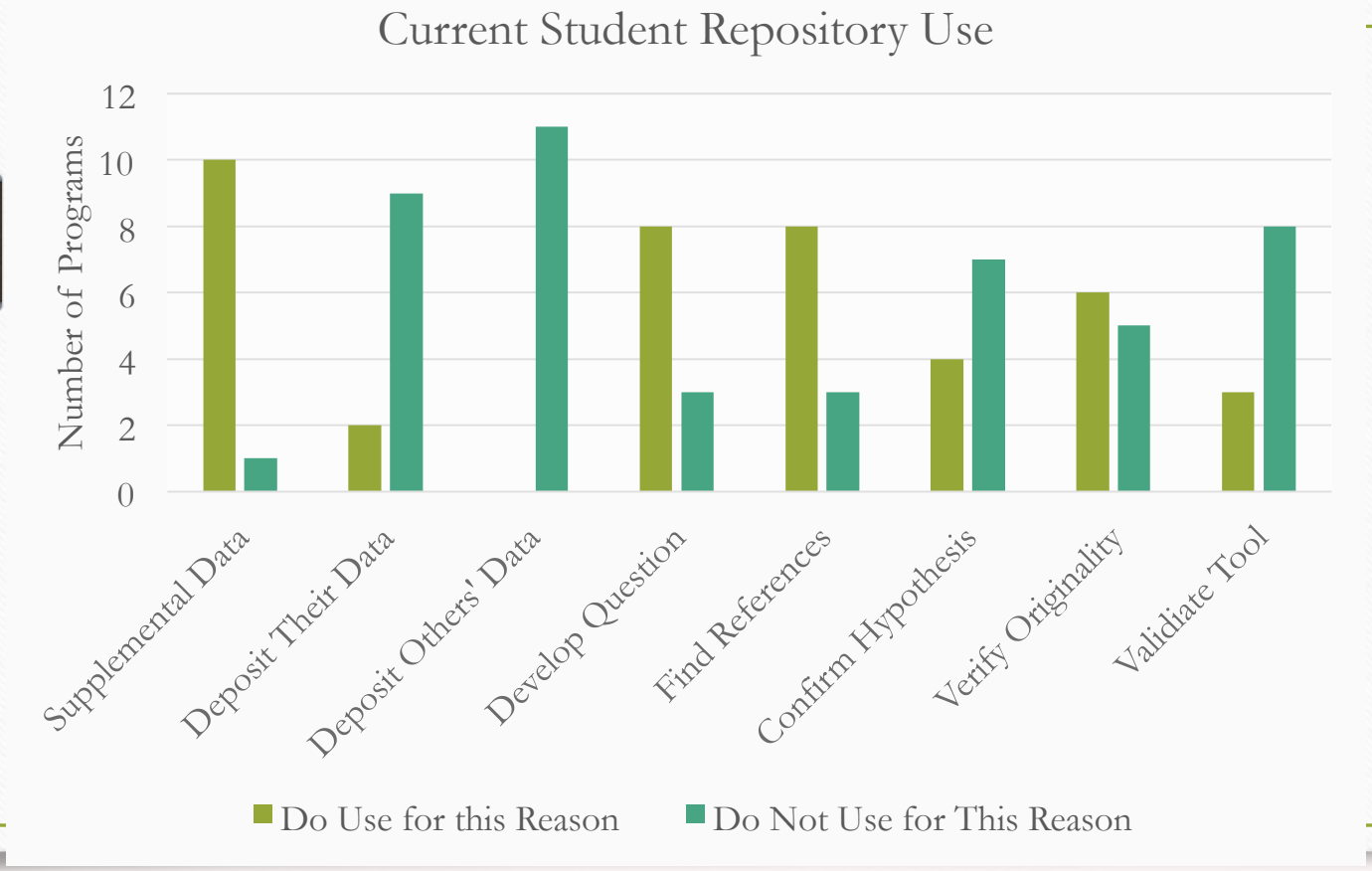
- Half of programs report students using data repositories
  - For references, getting data – 27.3%
  - To share data – 4.5%

Results: Self assessment of program effectiveness

- Belief in graduates understanding of data sharing importance
  - 50% are unsure
  - 29.2% do not believe graduates have an understanding
- Belief in graduates data management skills
  - 41.7% believe graduates have good skills
  - 16.7% do not believe, 16.7% are unsure, and an additional 16.7% report mixed results

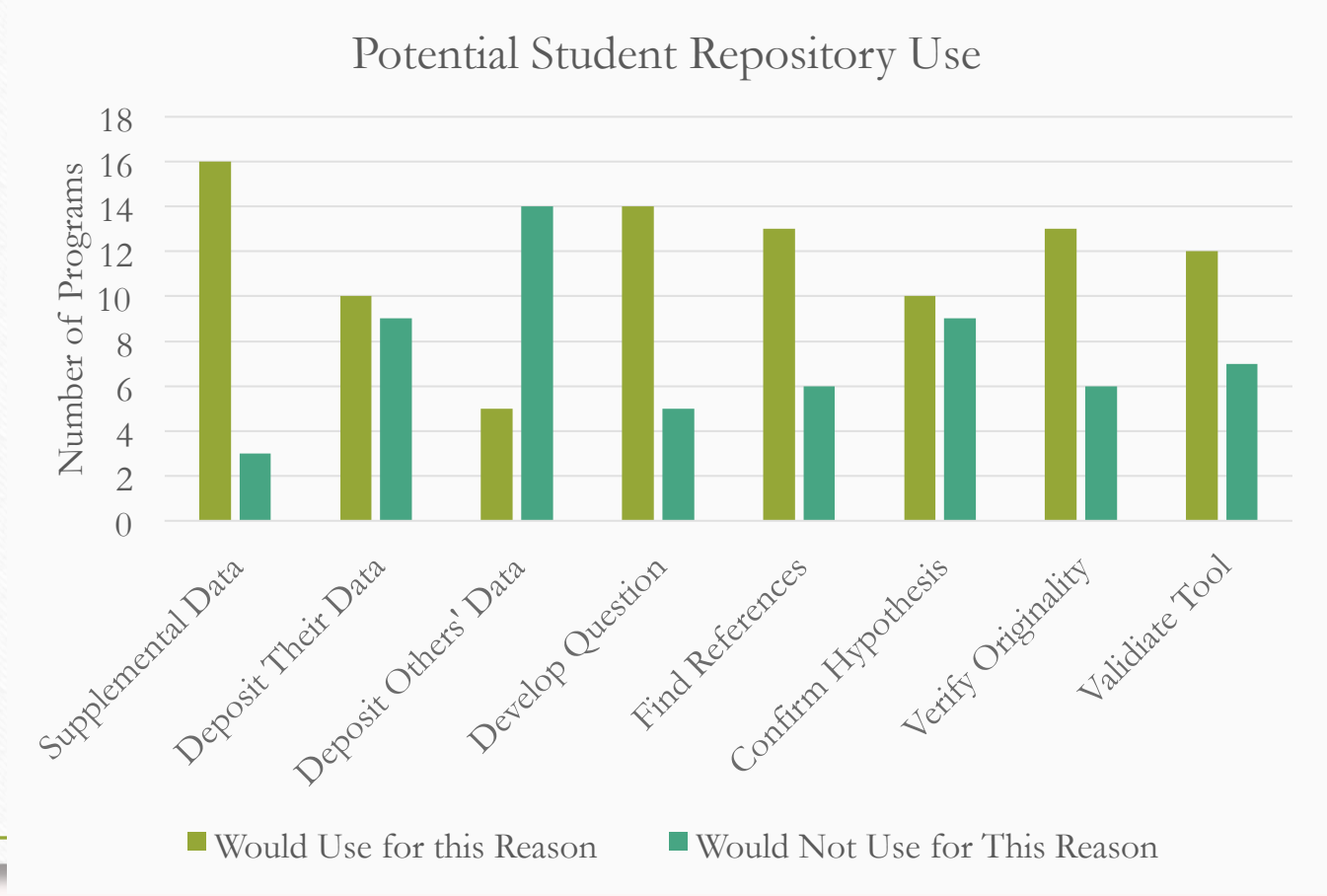


Results: Use of Repositories



- Most common reasons for currently using a repository:
  - Supplemental data
  - Developing a research question
  - Finding references or resources

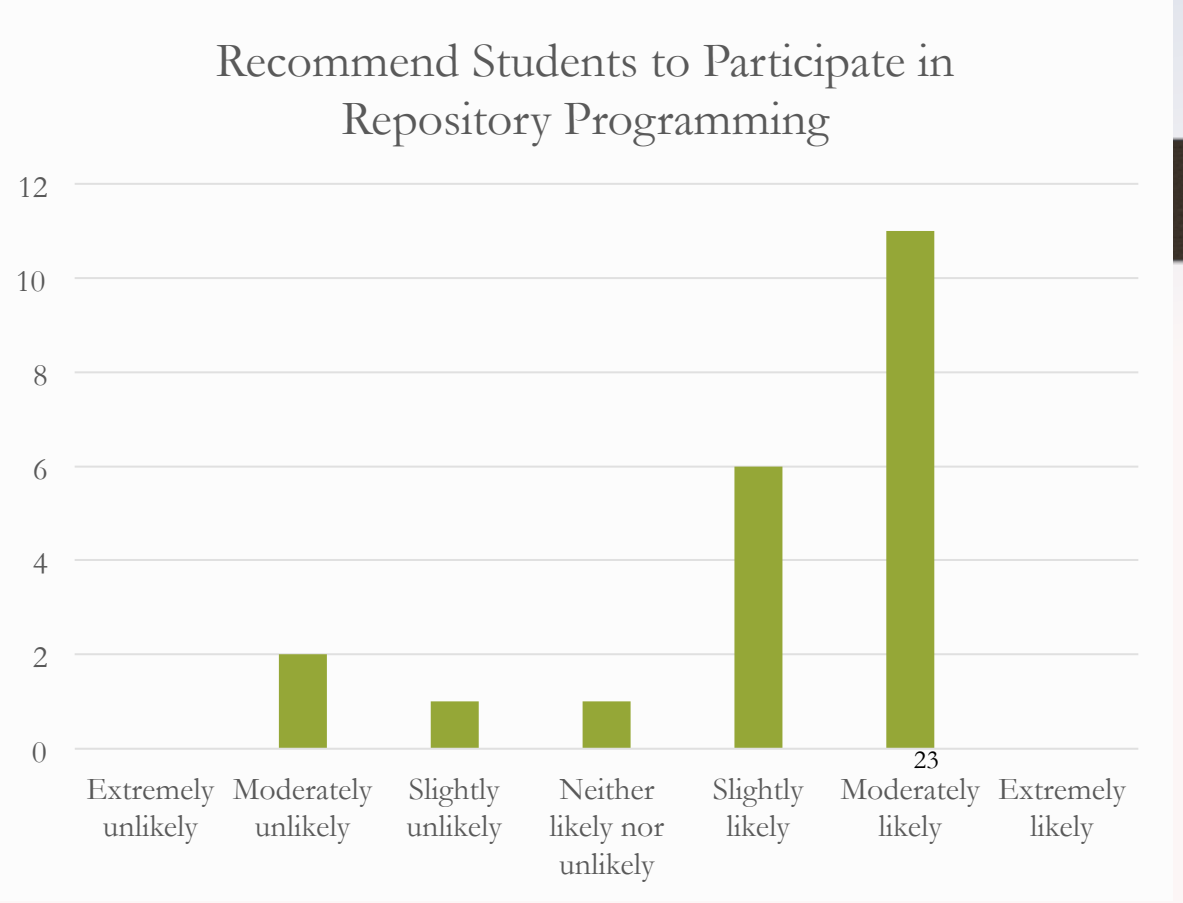
Results: Use of Repositories



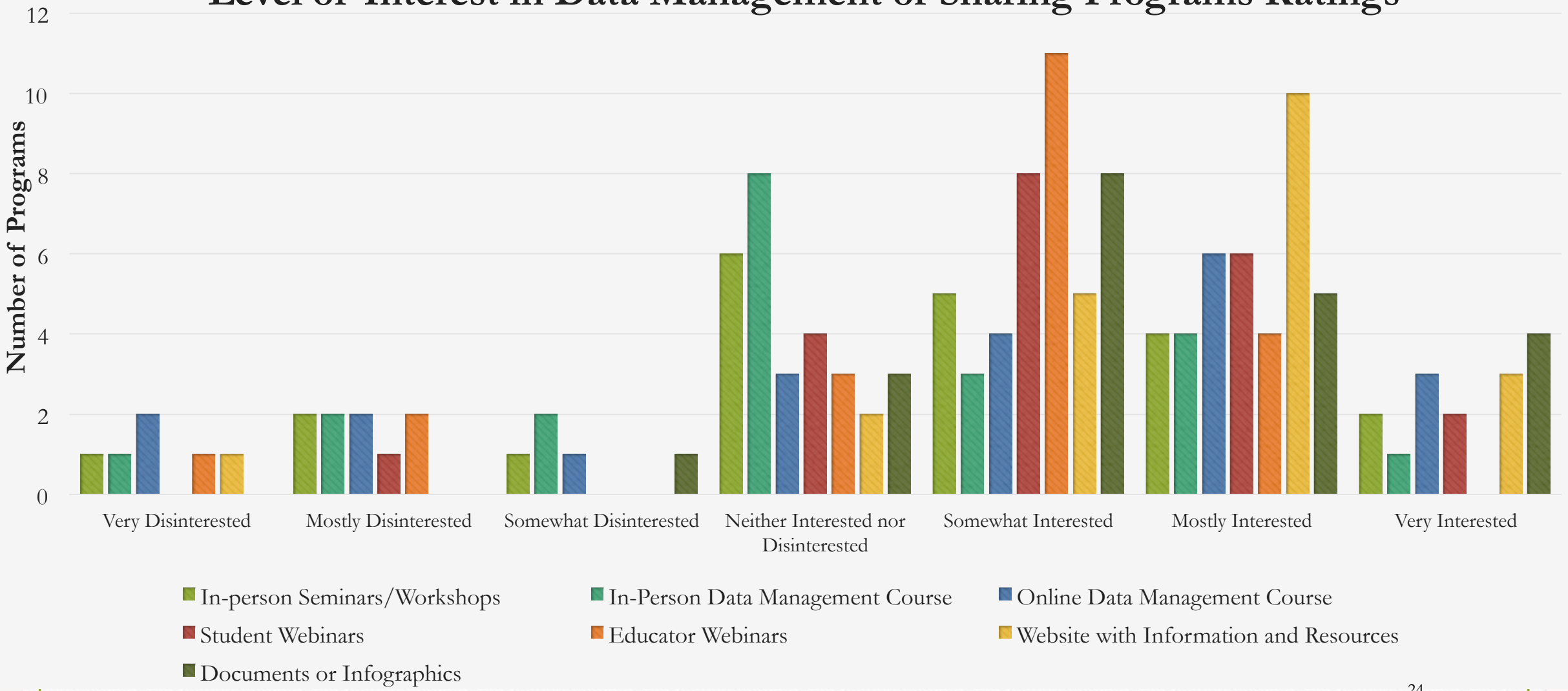
- Most frequent reasons why a student might use a repository
  - Accessing supplemental data
  - Developing a research question
  - Finding resources or references
  - Verifying the originality of their ideas

Results: Interest in Repository Programming

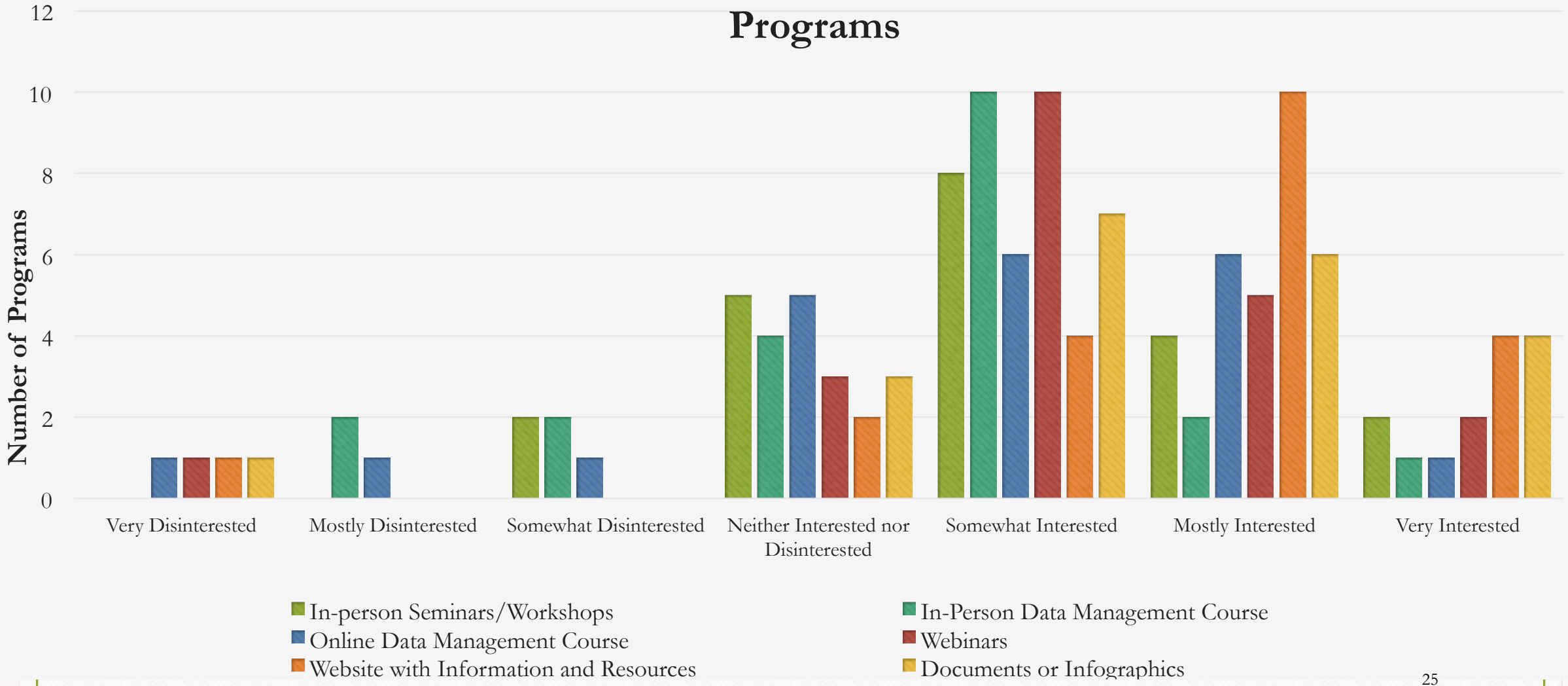
- Most were unaware of any programs
  - 66.7% report no students attending any
- The majority of programs reported potential interest
  - 20.8% reported a definite interest
  - 62.5% reported maybe being interested
- Likelihood of recommending students participate



Level of Interest in Data Management or Sharing Programs Ratings



Perceived Level of Student Interest in Data Management or Sharing Programs



Conclusions

- Few programs include discipline specific ethics
- More programs than expected included information about data management
  - This information, when provided, was almost always within another course
- Training in data sharing or data repository use appears to be limited
- Few students appear to be using repositories in graduate school
  - Limited exposure to use and to sharing during training
- Despite what appears to be incomplete training, programs report high levels of confidence
  - More confident in data management than in data sharing

What can we do as data service professionals?

- Offer trainings and resources as much as we can
  - Results suggest a general interest in programs provided by repositories
    - Challenges of participation in current programs
  - Interest in other types of programs or items
    - In-person strategies
    - Online strategies
      - Coursework
      - Resources

What can we do as data service professionals?

- Connect with graduate students now
  - More inclined to connect with us in the future
  - Prepares us to adapt and meet the changing needs of our consumers
  - Novel research and new types of data
    - Help work out questions for storage and dissemination

Future Questions

- Project expansion
  - Including more social science subfields
  - Comparison with other disciplines
  - Surveying students – do they interpret the same way?
- How do we convince established researchers to share data?

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