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Engaging Liaison Librarians: Identifying Impact of an Research Data Management Educational Intervention

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Abstract:

Research data management (RDM) support has developed in US academic libraries for nearly a decade following the 2011 National Science Foundation requirements for data sharing plans. The majority of these services have been undertaken by subject and liaison librarians, who face reskilling challenges and the need for continuing education in research data activities and subject expertise. Though introductory educational resources exist, little research has been conducted about how liaison librarians engage with this material; how their RDM work evolves over time; the efficacy of a given educational intervention; or their further educational needs or wants. The Association of College and Research Libraries (ACRL) Research Data Management Road Show curriculum was developed by the investigators. However, its efficacy in providing relevant educational material for liaison librarians who are engaging in research data management activities was untested.

To address this, the investigators developed a series of online surveys and recruited attendees of the Research Data Management Road Show. The attendees were asked, prior to Road Show attendance, to respond to a brief survey to assess current knowledge, behavior, and attitudes. Following their participation in the Road Show, attendees are invited to respond to surveys at 1 months and 6 months to identify changes in knowledge, behavior, and attitudes regarding research data management and perceived impact of the event. The first year data evaluates outcomes from eight Road Shows, seven held in the US and one at an international location, informing understanding of the self-identified RDM educational needs of liaison librarians.

Keywords: research data management, liaison librarians, data education, data information literacy

Introduction

Research data management (RDM) support has developed in US academic libraries for nearly a decade following the 2011 National Science Foundation (NSF) requirements for data sharing plans.¹ The majority of these services have been undertaken by subject and liaison librarians, who face reskilling challenges and the need for continuing education in research data activities and subject expertise.² Though introductory educational resources exist, little research has been conducted about how liaison librarians engage with this material; how their RDM work evolves over time; the efficacy of a given educational intervention; or their further educational needs or wants. During the creation of the Association for College and Research Library Research Data Management Road Show workshop, the curriculum developers identified the opportunity to assess their educational impact and to identify the knowledge, behavior, and attitudes of liaison librarians surrounding research data management.

Literature Review

Even prior to the NSF announcement, academic libraries had begun pursuing the opportunities to take on RDM services at their institutions.²⁻⁴ Liaison and subject librarians who worked directly with faculty, students, and researchers soon became the focus of implementing these services, particularly those in the sciences.⁵⁻⁷ This has led to literature examining the skill sets librarians may need,^{8,9} assessments of perceptions of the library as a data service provider,¹⁰ extensive discipline and institution case studies for librarians to understand data needs,¹¹⁻¹⁶ and the emergence of courses, books, and lists of resources for librarians to self-educate in RDM.^{17,18}

Despite this, assessment of liaisons' knowledge and behaviors about research data management has been limited, with Tenopir, et al's paper assessing preparedness and beliefs serving as the only paper to directly address this issue.¹⁹ While this research surveyed current skill sets and attitudes of librarians regarding RDM, it did not address any particular learning opportunity and primarily targeted librarians who were focused on scientific data. As a result, this research is potentially skewed towards reporting attitudes of librarians who were most likely to be impacted by data management on a regular basis, while more general knowledge and attitudes across disciplinary expertise is as yet poorly understood.

Development of the RDM Road Show

In Fall 2015, the Association for College and Research Libraries (ACRL) invited librarians to apply to develop a curriculum for teaching research data management to liaison librarians. This call followed a highly successful pre-conference on data management and was intended to build off a popular model of teaching scholarly communication, known as the Scholarly Communications Road Show. In this model, two presenters traveled to an institutional host and provided a full day workshop to a targeted audience from a prepared curriculum of presentations and activities. The researchers were chosen in December 2015 and developed their curriculum over the following six months. Simultaneously, they constructed this research project to run concurrently with the workshop over its first five years.

The Research Data Management (RDM) Road Show is a 8.5 hour workshop which can be licensed through ACRL.²⁰ The materials for the workshop are available under a Creative Commons CC-BY-NC license on the Scholarly Communications Toolkit.²¹ The workshop

has the targeted audience of liaison and subject librarians and is intended to provide an introduction to and hands on practice with fundamentals of research data management. The stated learning objectives work the workshop are that participants will:

- Identify data within the research process and lifecycle in order to articulate the role of the libraries in the management of data to researchers.
- Develop expertise in the nuances of disciplinary requirements for data management in order to educate their faculty and students about data best practices for their discipline.
- Articulate specific existing library skills that they already possess which transfer to data services.
- Identify campus RDM partners in order to create an environment of support.
- Articulate the parts of a data management plan in order to describe its role as a living document within a research project.
- Apply their relevant prior knowledge of their disciplines in order to create a research data management interview plan in order to facilitate faculty engagement.²⁰

Research Project Methods

The researchers developed a series of surveys to be given to participants participating in the RDM Road Show. Workshop hosts are given information about the research project by ACRL as part of the licensing process, however, all contact and engagement is then performed by the researchers.

Approximately three weeks prior to Road Show attendance, attendees are invited to respond to a brief survey to assess current knowledge, behavior, and attitudes. The questions included institutional demographics; job title; current personal and institutional RDM engagement; self-evaluation of RDM skills; intended goals for the workshop; and desired educational needs. Participants are given the option of having their data used only to inform the local presenters or to be included in the research project. Pre-event survey data is provided to the presenting team prior to the event to facilitate engagement and may be used as summary data during an individual event.

During the Road Show, the research project is presented again to attendees and they are invited to sign up to respond to surveys at 1 months and 6 months after their workshop to identify changes in knowledge, behavior, and attitudes regarding research data management and perceived impact of the event. If one of the researchers is not also a presenter, the list of post-event research participants to the researchers. In the follow up surveys, in place of intended goals for attending the workshop, participants are asked about the impact of the RDM Road Show as an educational intervention.

The surveys are hosted in the Purdue University installation of Qualtrics and raw data is only accessible by the researchers. Personally identifying information is limited to job title and years of experience. This research protocol was reviewed by the Purdue University and University of Illinois at Chicago Institutional Review Boards, Protocol 1603017411 and 2016-1069. Completion of any of the surveys is not required in order to participate in the RDM Road Show.

Data analysis was performed in Microsoft Excel. Summary statistics and Anova were calculated across the data for each level of response for all available Road Shows that were completed within the first year. The median was selected as the measure of central tendency

due to the nature of the data, i.e. Likert Scale responses. Parametric tests are used due to adequate sample size and normal distribution.

Research Project Results for Year 1

Eight Road Shows were held during the first year of the project, with seven in the continental United States and one in the Caribbean. A total of 352 attendees participated in the workshops across the locations. Of these, 202 participated in the pre-event survey, 46 participated in the 1-month post-event survey, and 30 participated in the 6-month post-event survey. At the time of submission, six of the first year Road Shows had received the 6-month post-event survey.

Did librarian perceive an increase in their skills, knowledge and training to provide research data management services?

The data from the surveys indicate that, prior to attending the Road Show, 20% of attendees (35/185) indicated that they did not agree with the statement "*As a librarian, I have the skills, knowledge and training to provide RDM services.*" One month after attending this number held nearly steady at 19.5% (9/46). At 6 months post Road Show participation, this number rose to 33% (10/30). The change over time among individual Likert scale responses (Strongly Agree, Agree, Neither Agree Nor Disagree, Disagree, Strongly Disagree) indicate a shift from Neither Agree Nor Disagree to Agree and to Disagree, i.e. participants either became more confident in their skills or less confident in their skills in the six months after attending the Road Show. (See Figures 1, 2, 3)

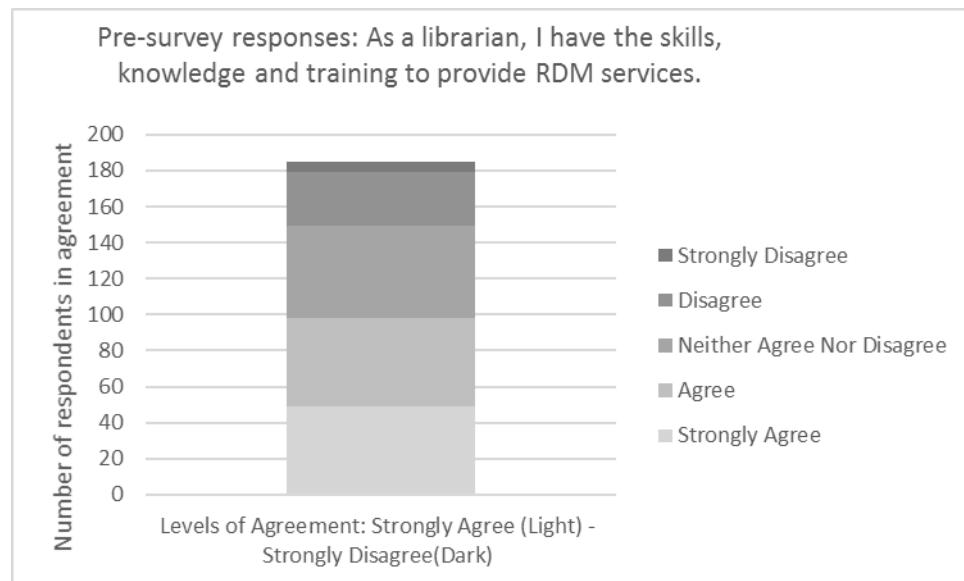


Figure 1: Pre-survey responses to “As a librarian, I have the skills, knowledge and training to provide RDM services.”

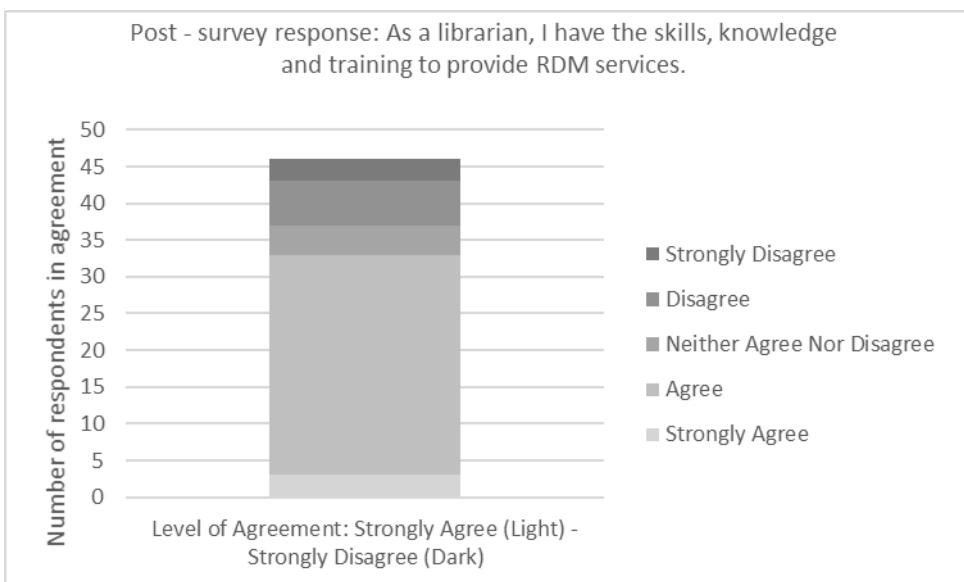


Figure 2: Post survey responses to “As a librarian, I have the skills, knowledge and training to provide RDM services.”

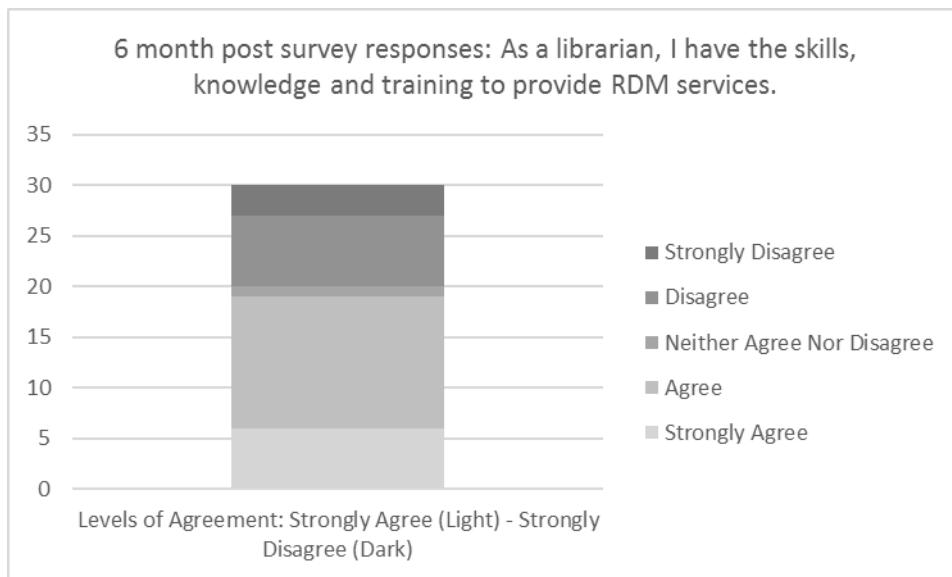


Figure 3: Six month post survey responses to “As a librarian, I have the skills, knowledge and training to provide RDM services.”

However, when asked how influential the Road Show was on their response to the question “As a librarian, I have the skills, knowledge and training to provide RDM services,” respondents indicated that the Road Show was Extremely Influential or Influential at both the one month (88%; 39/44) and six month (90%; 27/30) mark by significant margins. (See Figures 4, 5)

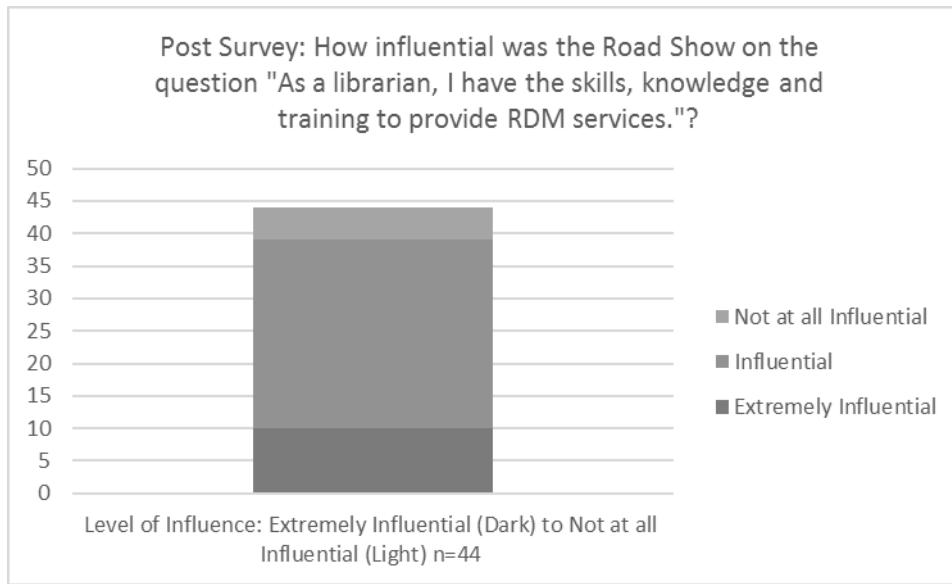


Figure 4: One month post survey responses to “How influential was the Road Show on the questions “As a librarian, I have the skills, knowledge and training to provide RDM services?”

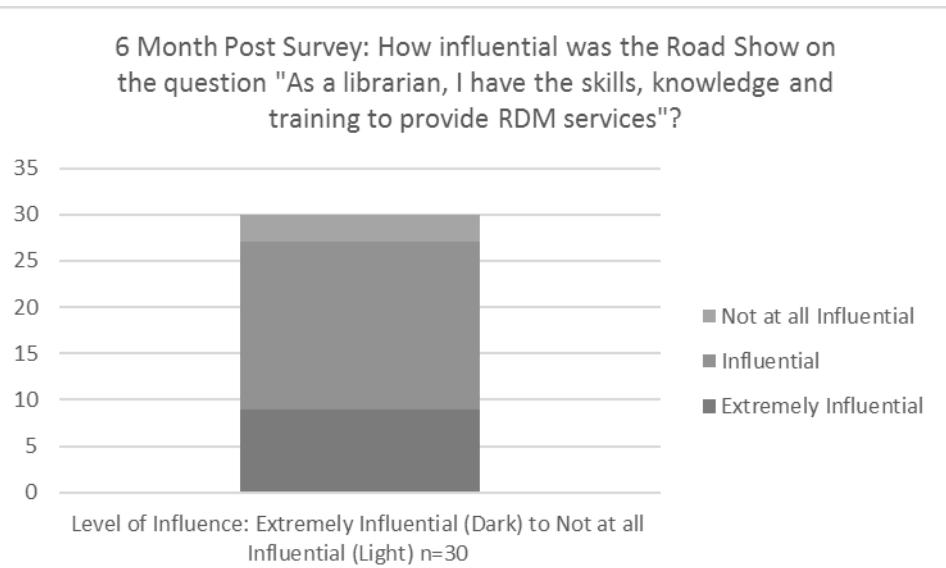


Figure 5: Six month post survey responses to “How influential was the Road Show on the questions “As a librarian, I have the skills, knowledge and training to provide RDM services?”

Can librarians identify traditional library skills that correlate with research data management services?

In the responses to the question “*As a librarian, I can identify traditional library skills with correlates in research data management services*”, there is a significant trend moving towards Strongly Agree and Agree from the pre-survey to the two post-surveys. In the pre-survey, 35% of respondents (34/186) indicated that they disagreed or strongly disagreed with the above statement. In the post survey, and six month post survey, those numbers dropped to 0 % (0/45) and 10% (3/30) respectively.

When then asked about the influence of the Road Show on the responses to this question, 9% (4/44) and 6% (2/30) of respondents indicated that the Road Show had no impact on their ability to identify correlations between traditional library skills and research data management services. This indicates that the vast majority of participants found the Road Show had an impact on identifying transferable skills that apply to research data management services.

Can librarians recognize opportunities for library involvement in research data management at each point in the data life cycle?

This question elicited knowledge of library activities in research data management and the stages of the data life cycle. Participants indicated in the pre-survey that 23 % (44/186) disagreed or strongly disagreed with the statement, indicating a low level of confidence in their own abilities to identify either library activities or the stages of the data life cycle or how these could be related to each other. (See Figure 6.)

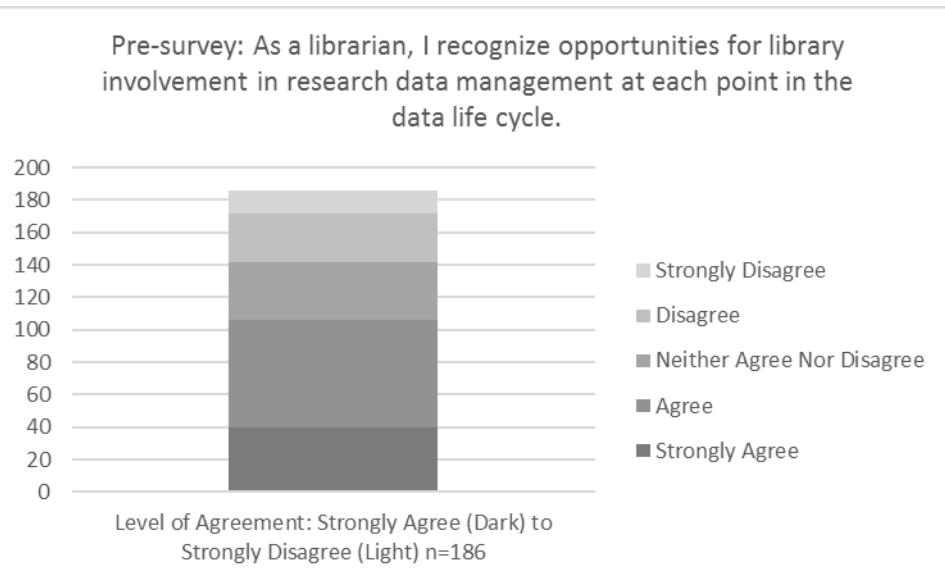


Figure 6: Pre-survey responses to “I recognize opportunities for library involvement in research data management at each point in the data life cycle.”

In the one month post survey, respondents indicated that they had a significant shift towards agreement with the statement. 84% (38/45) now indicated that they strongly agreed or agreed with the statement. Only 2 respondents of 45 indicated disagreements with the statements. (See Figure 7).

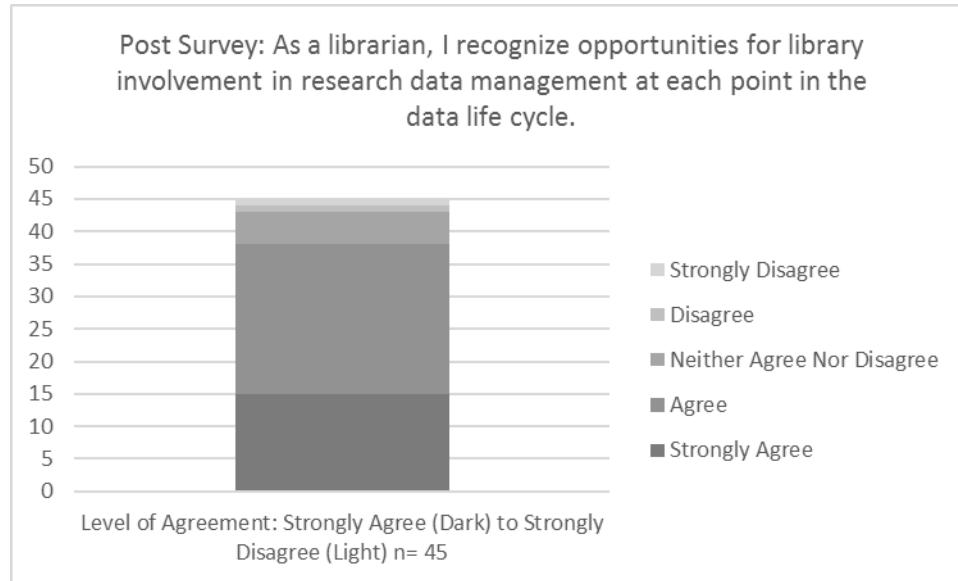


Figure 7: Post-survey responses to “I recognize opportunities for library involvement in research data management at each point in the data life cycle.”

This trend held in the six month post surveys. 23 respondents of 30 (77%) continue to Strongly Agree and Agree with the statement, while only 1 respondent strongly disagreed with the statement. This indicates that the respondents retained knowledge of library activities in research data management or the data life cycle or the intersection of the two. (See Figure 8.)

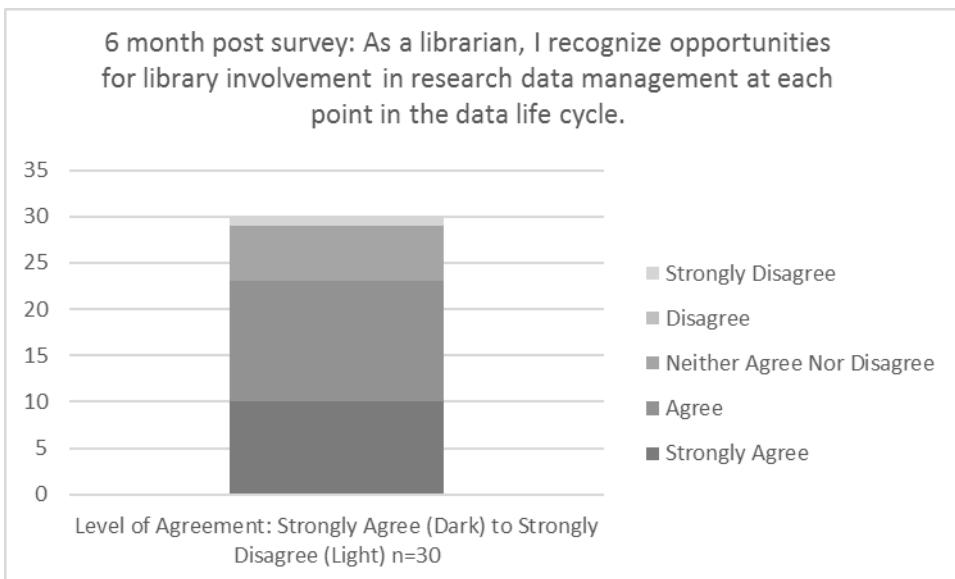


Figure 8: Six month post survey responses to “I recognize opportunities for library involvement in research data management at each point in the data life cycle.”

When asked about the influence of the Road Show on their response to this question, respondents in the post survey and six month post survey indicated a similar level of influence across both surveys. In the post survey responses, participants identified the Road Show as extremely influential in 53% of responses (23/43). Seventeen respondents agreed that the Road Show was influential (17/43; 40%). (See Figure 9.)

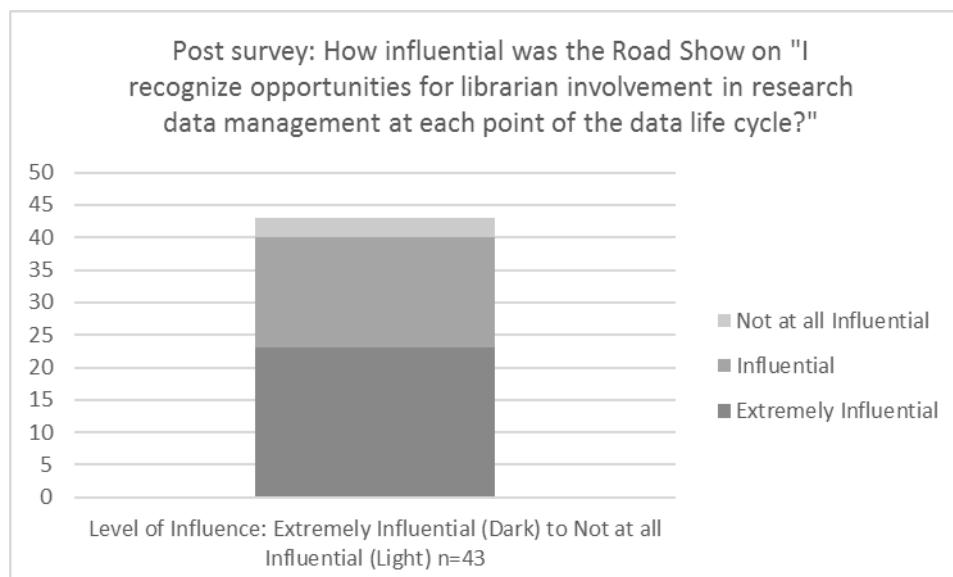


Figure 9: One month post survey responses to “How influential was the Road Show on ‘I recognize opportunities for librarian involvement in research data management at each point of the data life cycle?’”

At six months post Road Show, participants believed that the Road Show was extremely influential in 50% (15/30) of cases; an additional 46% of respondents indicated that the Road Show was influential on their successful mastery of this concept. (See Figure 10.)

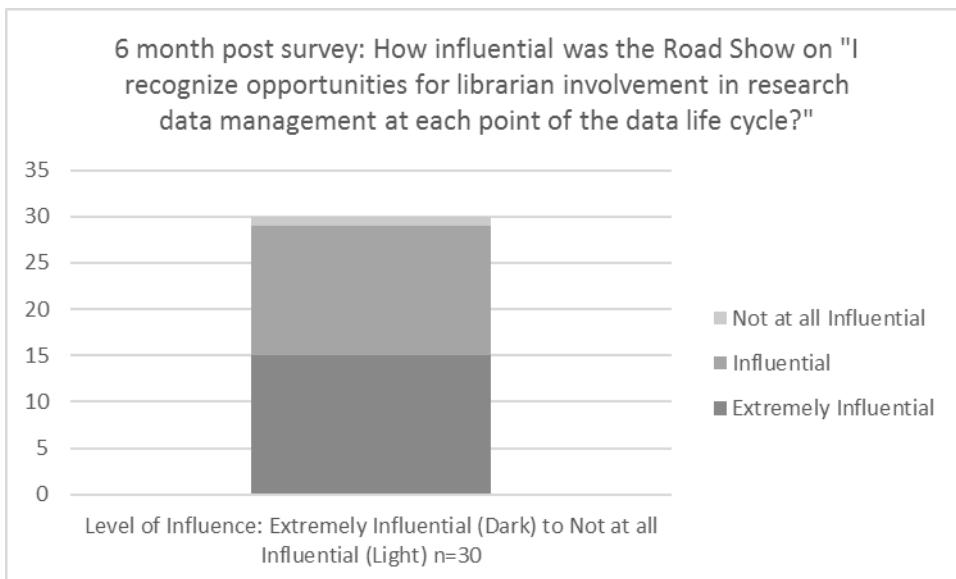


Figure 10: Six month post survey responses to “How influential was the Road Show on ‘I recognize opportunities for librarian involvement in research data management at each point of the data life cycle?’”

Can librarians discuss data management practices with a researcher formally or informally? Prior to the Road Show, participants were roughly equally divided (79 strongly agree or agree versus 75 disagree or strongly disagree, n=187) between those who felt that they could discuss data management practices informally or formally. (See Figure 11.) This distribution was skewed to Agree (64/187) and Disagree (40/187), with a mode falling in the Agree Likert category.

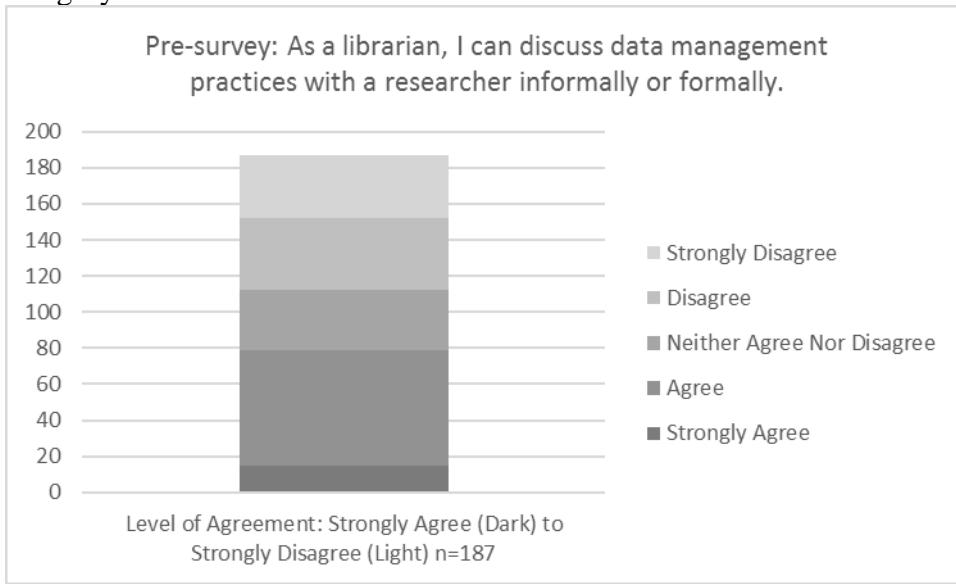


Figure 11: Pre survey responses to “As a librarian, I can discuss data management practices with a research informally or formally.”

After participation in the Road Show, the responses to the one month post survey shows a significant shift in responses to the category Agree and Strongly Agree. 17% (8/45) of participants now strongly agree that they can discuss data management practices with a researcher, while 58% (26/45) indicate that they agree with the statement. (See Figure 12)

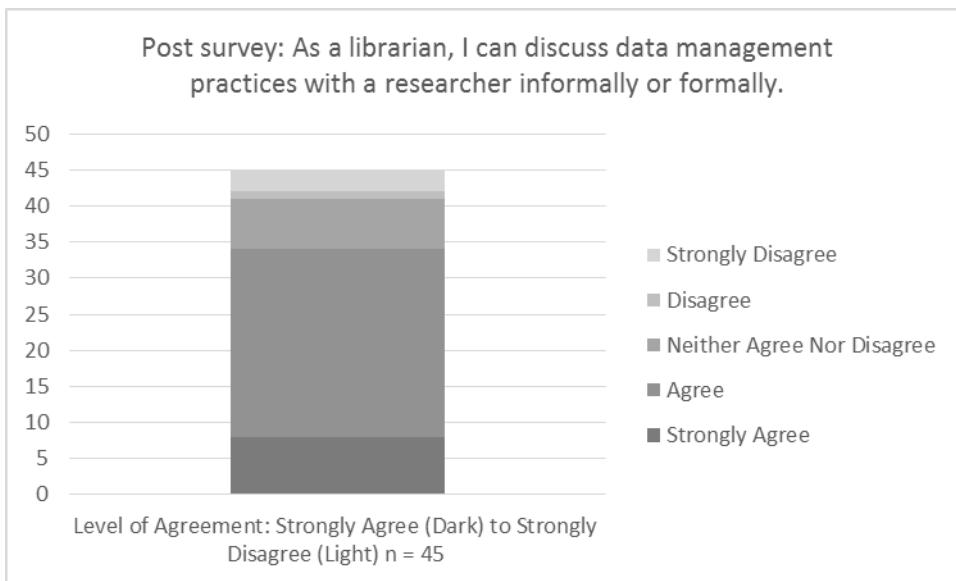


Figure 12: Post-survey responses to “As a librarian, I can discuss data management practices with a research informally or formally.”

Participants taking the one month survey indicated that they felt that the Road Show was extremely influential in 44% of cases (19/43); respondents indicated that they felt that the Road Show was influential in 42% (18/43) of responses. (See Figure 13.) These results indicate a high likelihood that the training on data management practices enable librarians to be confident in articulating data management to researchers.

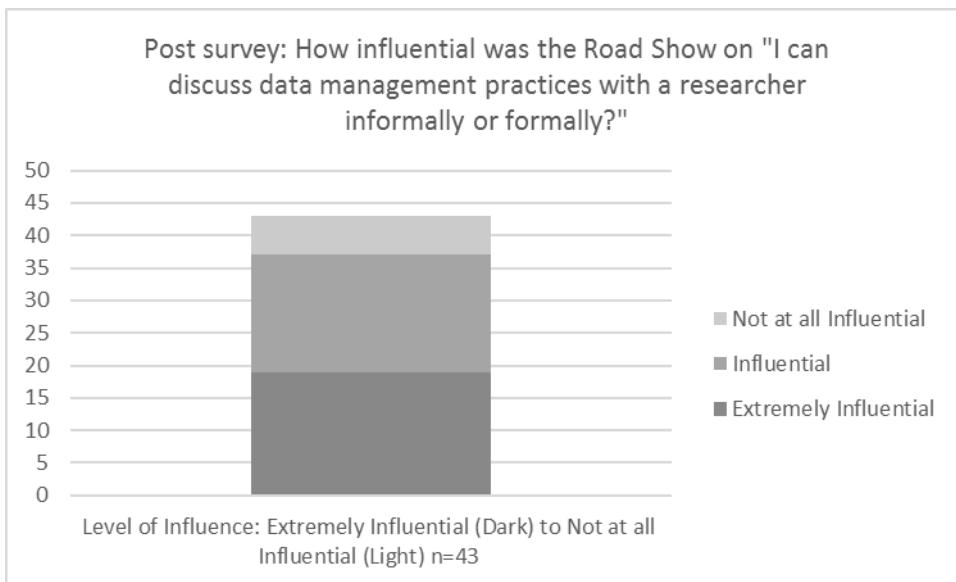


Figure 13: Post-survey response to “How influential was the Road Show on ‘I can discuss data management practices with a researcher informally or formally?’”

At six months after the Road Show, participants indicated that the majority agreed or strongly agreed with the statement “As a librarian, I can discuss data management practices with a research informally or formally.” Nineteen of thirty (63%) indicated Strongly Agree or Agree. (See Figure 14).

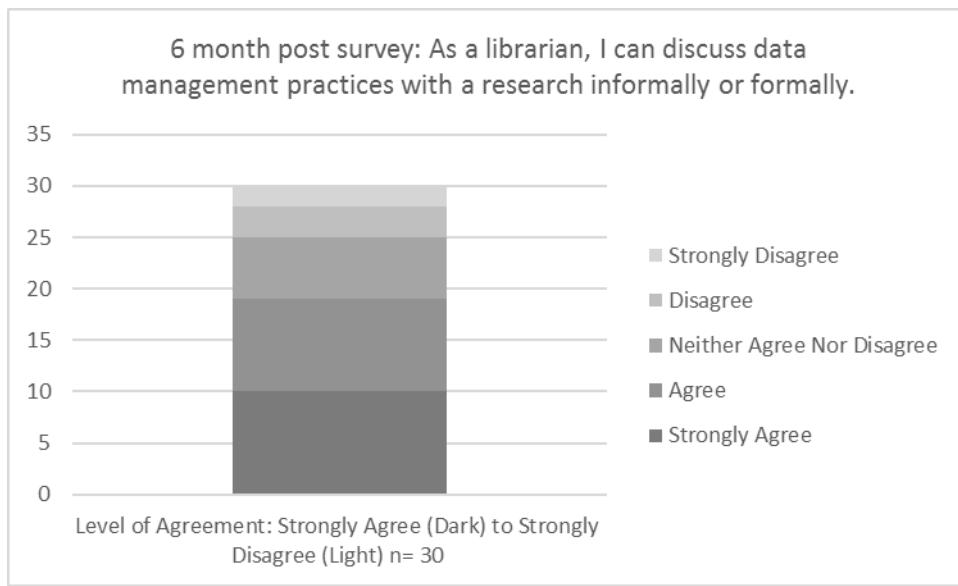


Figure 14: Six months Post survey response to “As a librarian, I can discuss data management practices with a researcher informally or formally.”

The six month survey participants indicate that they consider the Road Show to be largely influential on their ability to discuss data practices with a researcher. 86% (26/30) of respondents attributed influence to the Road Show.

Discussion

The RDM Road Show sets out to provide introductory information and hands-on activities for liaison librarians who may not yet be engaged in research data management. While many of the individuals may not ever be deeply engaged in partnering with researchers on data curation or data information literacy instruction, the majority may have the opportunity to integrate data management activities into their work as librarians.

Limitations

The pre-survey has the highest response rate of 57% (202/352 total participants). With each succeeding survey, the response rate dropped off. The one month post survey had a response rate of 13% (46/352 total participants). The six month post survey had a response rate of 8% (30/352 total participants). With a confidence level of 95% and a margin of error of 0.5, given the standard deviations of the returned responses, the minimum acceptable response rates have been met for the pre- and post- survey. However, the minimum acceptable response rate has not been met for the 6-month post-survey. (See Table 1).

Survey	Confidence Level	Margin of Error	Standard Deviation	Minimum Sample Size	Number of Responses	Number of Invitations	Actual Response Rate	Minimum Acceptable Response Rate
Pre-survey	95%	.5	.54	4	202	352	57%	1%
Post-Survey	95%	.5	.55	5	46	352	13%	1%
6 Month Post-Survey	95%	.5	17.32	4609	30	352	9%	1310%

Table 1: Required Sample Size calculations based upon Standard Deviation of existing data

In order to preserve the privacy of the individuals participating, we do not trace them across all surveys they participated in. Neither do we trace data to specific geographic locations or institutions. This limits the generalizability of the data. One hypothesis was that participants who were already engaged in research data management services would be more likely to complete the post-workshop surveys. This was not born out in the data. Those who were most likely to complete the post-workshop surveys represented themselves as occasionally interacting with patrons regarding research data. (See Figure 15.)

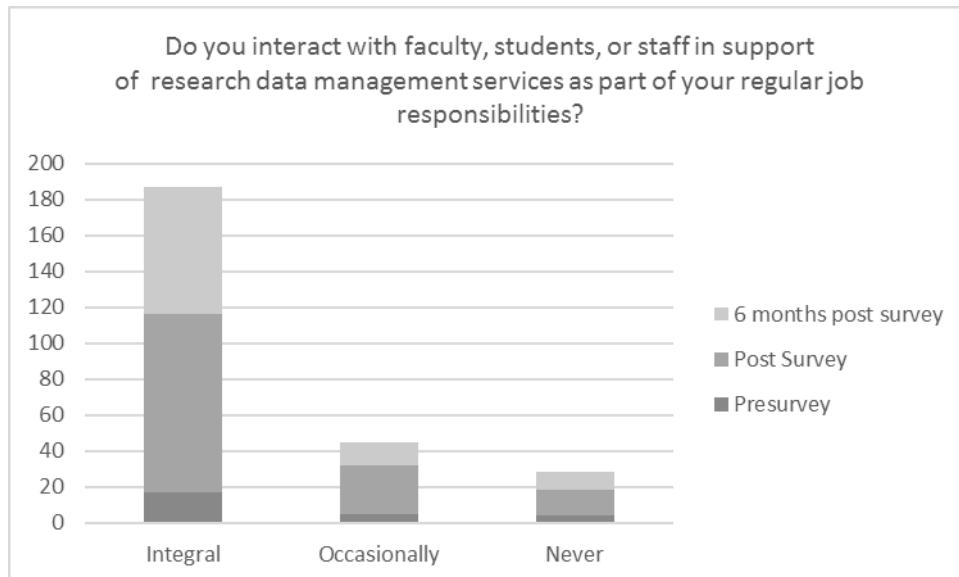


Figure 14: Do you interact with faculty, students, or staff in support of research data management services as part of your regular job responsibilities?

Therefore, a new hypothesis that might be subject to future research is to identify the number of interactions regarding research data management services that respondents have transacted within the previous month, including instruction and collection development. This may allow the authors to more clearly articulate who among the participants in the Road Show are completing the post-surveys.

The results discussed here when taken in aggregate indicate a trend towards greater comfort with foundational skills in providing research data management. While this trend is exhibited at different rates across the different questionnaire items, generally individuals are moving away from discomfort/disagreement, towards agreement with the statements provided.

Additionally, the data suggests a greater willingness by librarians to speak to researchers about their data management but less confidence in acting on what they may learn about. A promising trend is the interest in making campus referrals, which may connect researchers to additional assistance and center the library as a research networking hub around research data.

The post-workshop surveys suggested little implementation of services had occurred at the participants' institutions at the 1-month and 6-month marks. While the surveys do not specifically address why implementation has not occurred, this may be attributed to administrators being willing to fund training for library staff, but not yet providing further resources such as time, people, or money towards creating data management programs within their libraries.

What programming was identified continued to be library-centric rather than fully actualizing campus collaborations. Post-workshop participants described services that were solely library staffed and marketed to the broader campus rather than built in conjunction with any partner. In comparison with the 6-month post event willingness to refer to partners, this suggests interest but not yet cohesive implementation for data management outreach from the library to these campus partners.

Conclusion

The first-year data suggests that the ACRL Research Data Management Road Show successfully provides introductory training for liaison librarians and impacts their attitudes towards discussing data management with researchers and assisting them in finding campus resources. Further continuing education and administrative support is needed in order to fully implement data services within the library and between research support services and other engaged entities on campuses. Additional research from future RDM Road Shows will demonstrate the broader impact of this workshop and more explicitly identify the surveyed trends and clarify opportunities to engage the knowledge, behavior, and attitudes of liaison librarians in this area.

References

1. National Science Foundation. Dissemination and Sharing of Research Results. US NSF - About. <http://www.nsf.gov/bfa/dias/policy/dmp.jsp>. Published November 30, 2010. Accessed January 4, 2015.
2. Salo D. Retooling libraries for the data challenge. *Ariadne*. 2010;(64). <http://www.ariadne.ac.uk/issue64/salo>. Accessed August 19, 2015.
3. Gold, A. Cyberinfrastructure, data, and libraries, Part 1: a cyberinfrastructure primer for librarians. *-Lib Mag*. 2007;13(9/10). doi:10.1045/september20september-gold-pt1
4. Gold, A. Cyber infrastructure, data, and libraries, Part 2. *-Lib Mag*. 2007;13(9/10). doi:10.1045/july20september-gold-pt2
5. Raboin R, Reznik-Zellen R, Salo D. Forging New Service Paths: Institutional Approaches to Providing Research Data Management Services. *J EScience Librariansh*. 2012. doi:10.7191/jeslib.2012.1021
6. Cox A, Verbaan E, Sen B. Upskilling Liaison Librarians for Research Data Management. *Ariadne*. 2012;(70). <http://www.ariadne.ac.uk/issue70/cox-et-al>. Accessed August 2, 2017.
7. Antell K, Foote JB, Turner J, Shults B. Dealing with Data: Science Librarians' Participation in Data Management at Association of Research Libraries Institutions. *Coll Res Libr*. 2014;75(4):557-574. doi:10.5860/crl.75.4.557
8. Brown RA 1., Wolski M, Richardson J. Developing new skills for research support librarians. *Aust Libr J*. 2015;64(3):224-234. doi:10.1080/00049670.2015.1041215
9. Data management skills for LIS professionals. *CILIP Update*. 2013;12(1):7-7.
10. Tenopir C, Sandusky RJ 2., Allard S, Birch B. Research data management services in academic research libraries and perceptions of librarians. *Libr Inf Sci Res* 07408188. 2014;36(2):84-90. doi:10.1016/j.lisr.2013.11.003
11. Bracke MS. Emerging Data Curation Roles for Librarians: A Case Study of Agricultural Data. *J Agric Food Inf*. 2011;12(1):65-74. doi:10.1080/10496505.2011.539158

12. Buys CM, Shaw PL. Data Management Practices Across an Institution: Survey and Report. *J Librariansh Sch Commun.* 2015;3(2). doi:10.7710/2162-3309.1225
13. Averkamp S, Gu X, Rogers B. Data Management at the University of Iowa: A University Libraries Report on Campus Research Data Needs. 2014. http://ir.uiowa.edu/lib_pubs/153/. Accessed June 16, 2016.
14. Carlson J, Fosmire M, Miller CC, Nelson MS. Determining Data Information Literacy Needs: A Study of Students and Research Faculty. *Portal Libr Acad.* 2011;11(2):629-657. doi:10.1353/pla.2011.0022
15. Frank EP, Pharo N. Academic librarians in data information literacy instruction: a case study in meteorology. 2016. <https://oda-hioa.archive.knowledgearc.net/handle/10642/3470>.
16. Goben, Abigail, Griffin, Tina. In Aggregate: Trends, Needs, and Opportunities from Faculty Research Data Management Surveys. In: Lawrence, KS; 2017.
17. Goben A, Raszewski R. Policies and Background Literature for Self-Education on Research Data Management: An Annotated Bibliography. *Issues Sci Technol Librariansh.* 2015;82(Fall 2015). doi:10.5062/F4GB222C
18. Goben A, Raszewski R. Research Data Management Self-Education for Librarians: A Webliography. *Issues Sci Technol Librariansh.* 2015;82(Fall 2015). doi:10.5062/F4348HCK
19. Tenopir C, Sandusky RJ, Allard S, Birch B. Academic librarians and research data services: preparation and attitudes. *IFLA J.* 2013;39(1):70-78. doi:10.1177/0340035212473089
20. Association of College and Research Libraries. Research Data Management Road Show. Association of College & Research Libraries (ACRL). <http://www.ala.org/acrl/conferences/roadshows/rdmroadshow>. Published May 11, 2016. Accessed May 8, 2018.
21. Sapp Nelson, Megan, Goben, Abigail. Scholarly Communication Toolkit: ACRL Workshop: Research Data Management. [//acrl.libguides.com/scholcomm/toolkit/RDMWorkshop](http://acrl.libguides.com/scholcomm/toolkit/RDMWorkshop). Accessed May 8, 2018.