

[DRAFT] Carpentries Pre- and Post-Workshop Assessment Results

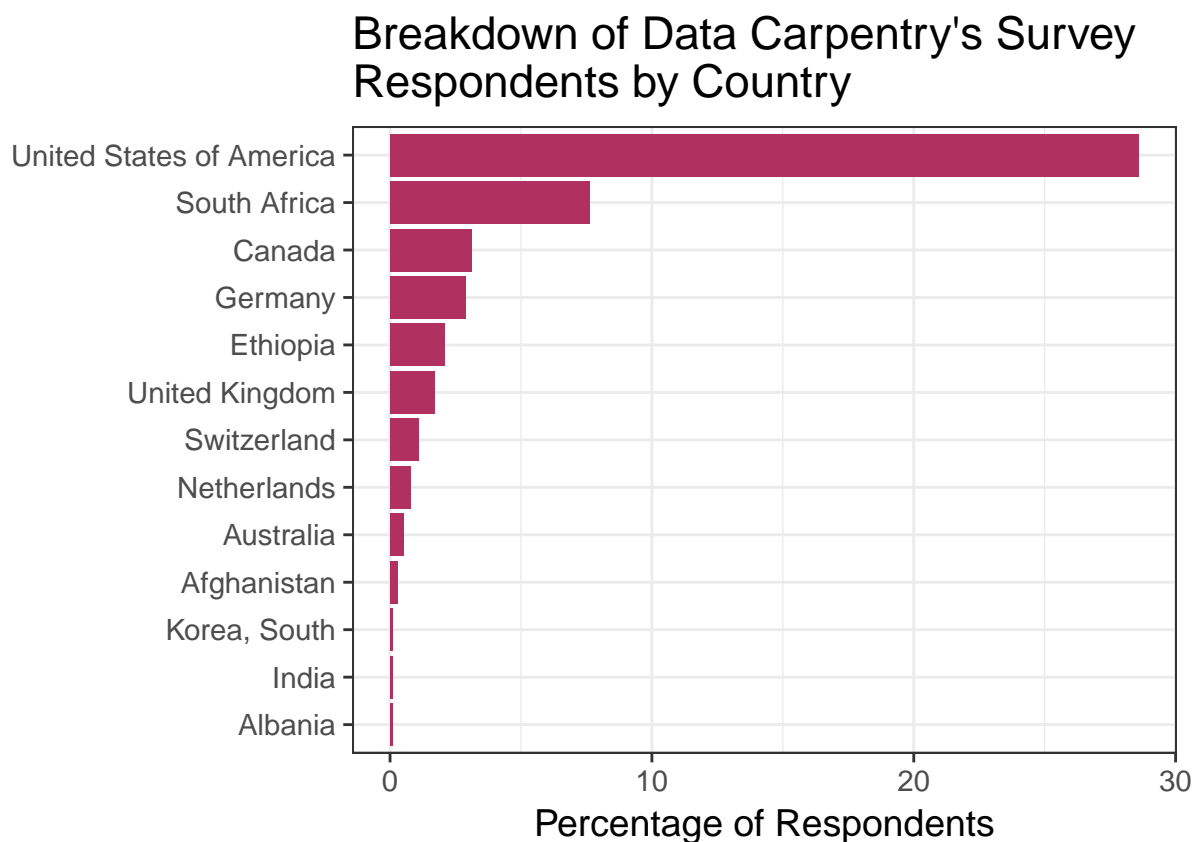
June 2018

The Carpentries Assessment Team releases short and long-term assessment results twice per year in June and January. The following results include analyses from both Data Carpentry and Software Carpentry's pre- and post-workshop surveys.

Data Carpentry (Pre-Workshop)

Demographics: Workshop Location

Data Carpentry learners are asked what country their workshop is held.



Demographics: Domain of Research/Work/Study

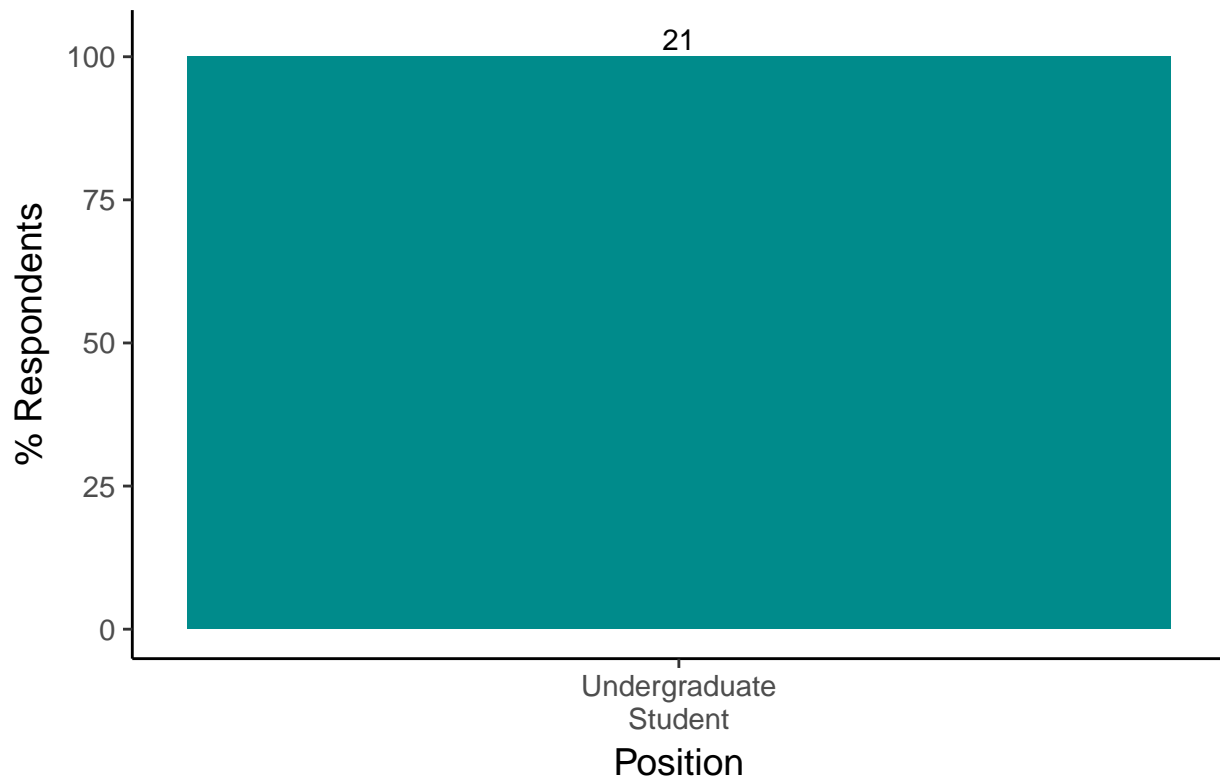
Data Carpentry's Respondents by Discipline	n	%
Life Sciences	189	19.9
Agricultural or Environmental Sciences	165	17.3
Bioinformatics/Genomics	106	11.1
Biomedical/Health Sciences	103	10.8
Social Sciences	70	7.4
Engineering	64	6.7

Data Carpentry's Respondents by Discipline	n	%
Mathematics or Statistics	56	5.9
Computer Science	47	4.9
Earth Sciences	43	4.5
Business/Economics	36	3.8
Humanities	33	3.5
Library Sciences	22	2.3
Physical Sciences	18	1.9

Demographics: Respondents' Position

Data Carpentry's Respondents by Position	n	%
Graduate Student	374	5.5
Research Staff	72	1.1
Postdoctoral Researcher	59	0.9
Faculty	51	0.8
Government Employee	29	0.4
Undergraduate Student	21	0.3
Retired/Not Employed	16	0.2
Industry Employee	15	0.2
Management/Administrator	8	0.1

Data Carpentry Respondents by Position



Demographics: Operating System

Learners are asked what operating system is on the computer they are bringing to the workshop.

Operating System	n	%
Windows	374	59.8
Apple/Mac OS	222	35.5
UNIX/Linux	20	3.2
Not sure	9	1.4

Respondents' Programming Usage

How often do you currently use any of the following?

Current Programming Usage	n	%
Never	125	34.0
Several times per year	60	16.3
Weekly	57	15.5
Less than once per year	47	12.8
Monthly	41	11.1
Daily	38	10.3

Respondents' Satisfaction with Current Data Management Practices

Satisfaction with current data management practices	n	%
Neutral	203	32.4
Not applicable	34	5.4
Not sure	40	6.4
Satisfied	71	11.3
Unsatisfied	215	34.3
Very satisfied	12	1.9
Very unsatisfied	51	8.1

Why did respondents attend a Data Carpentry Workshop?

Why are you attending this workshop?

Why are you attending this workshop?	n	%
To learn skills that I can apply to my work in the future	488	63.4
To learn skills that will help me get a job	241	31.3
As a requirement for my program/current position	41	5.3

How were Respondents' exposed to their Data Carpentry Workshop?

How did you find out about this workshop?

How did you find out about this workshop?	n	%
My friend/colleague told me about it	168	52.3
My advisor/supervisor told me about it	102	31.8
Read about it in a newsletter or university web site	33	10.3
Other web site	9	2.8
Twitter or other social media	9	2.8

Programming Language Covered in Workshop

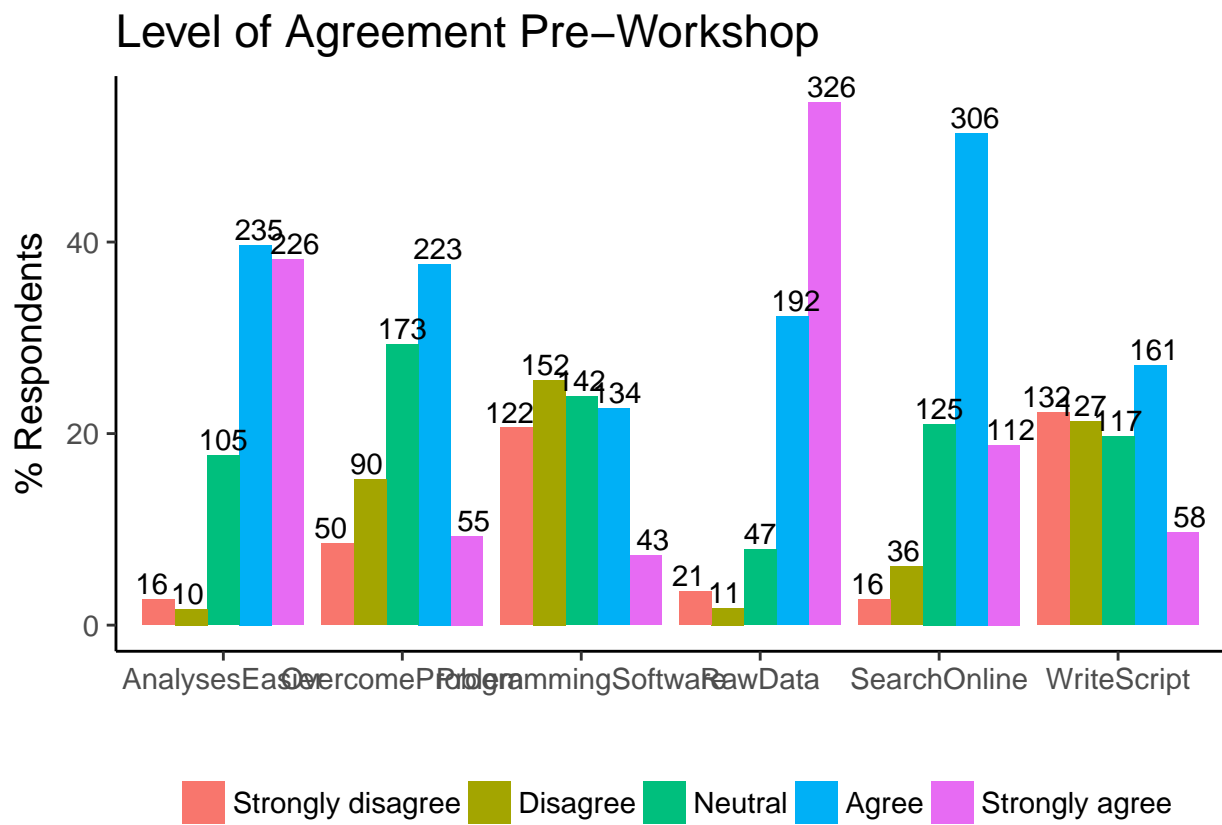
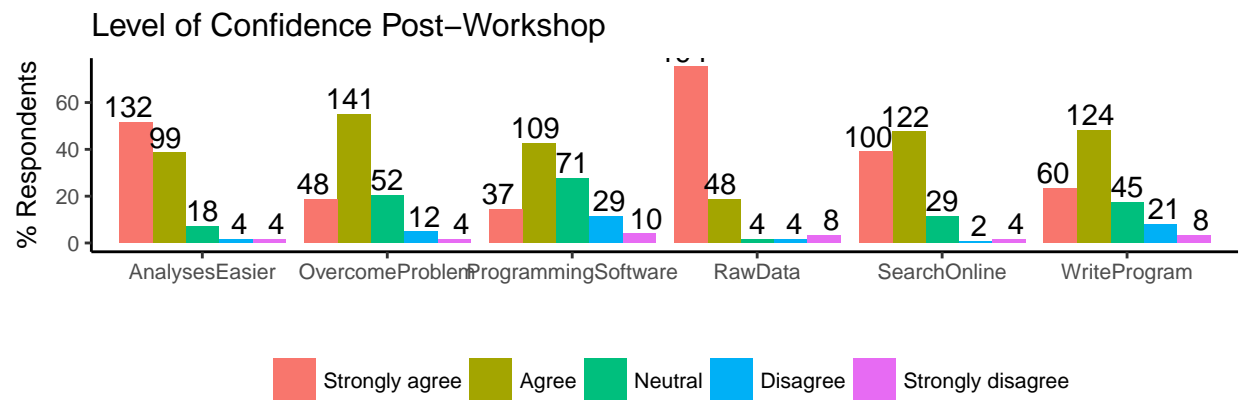
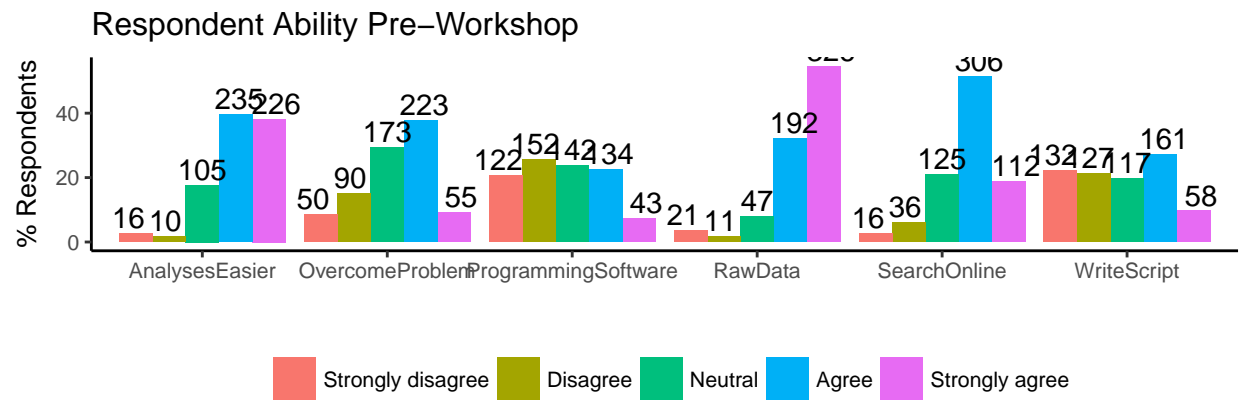
Which programming language is being covered?

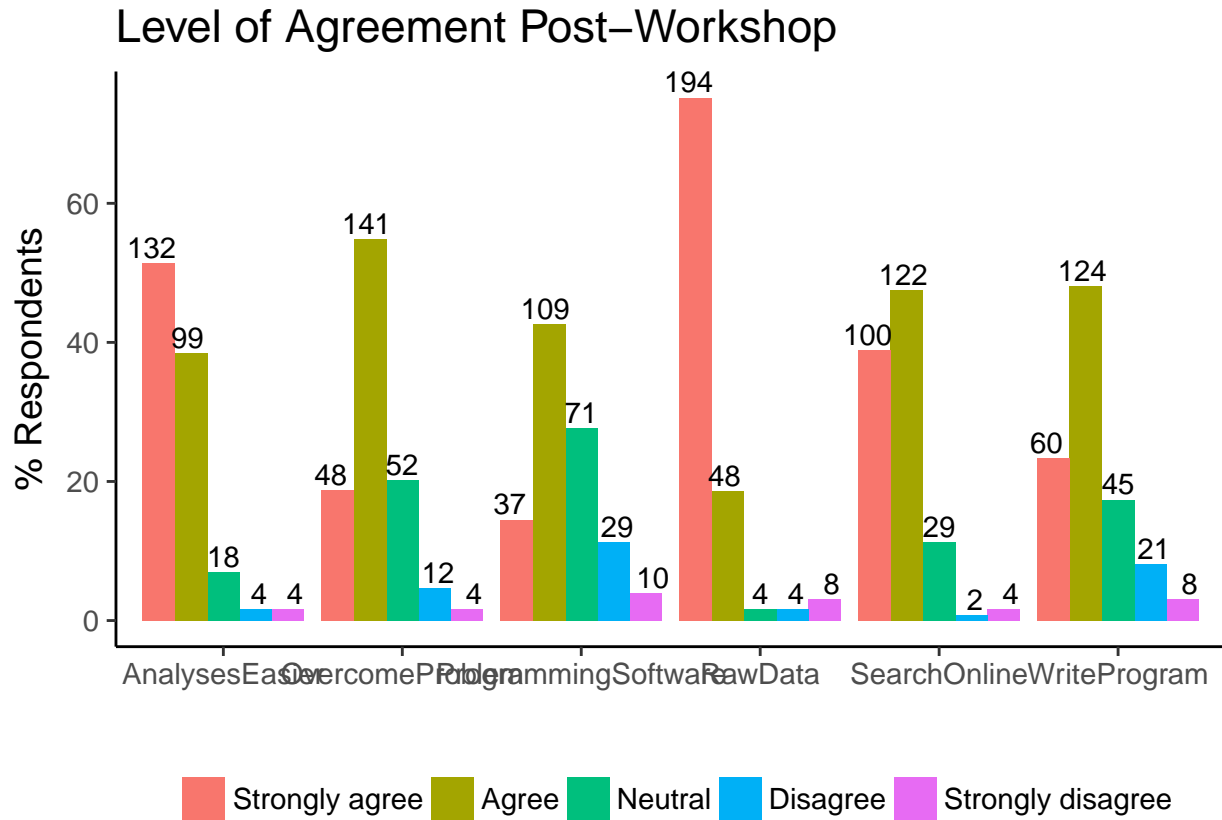
Which language is being covered?	n	%
R	383	60.6
I don't know/I don't remember	115	18.2
Python	115	18.2
Neither	19	3.0

Pre/Post Comparison for Data Carpentry's Workshop Outcomes

Learners were asked to rate their level of agreement with the following statements related to Data Carpentry's workshop goals and learning objectives. The figure below provides a visual representation of their responses, comparing them before the workshop and after the workshop. Axis labels and the corresponding question are as follows:

- **AnalysesEasier:** Using a programming language (like R or Python) can make my analyses easier to reproduce.
- **OvercomeProblem:** While working on a programming project, if I get stuck, I can find ways of overcoming the problem.
- **ProgrammingSoftware:** I am confident in my ability to make use of programming software to work with data.
- **RawData:** Having access to the original, raw data is important to be able to repeat an analysis.
- **SearchOnline:** I know how to search for answers to my technical questions online.
- **WriteScript:** I can write a small program/script/macro to solve a problem in my own work.





Paired Analyses Table

skill	mean_pre_feeling	sd_pre_feeling	mean_post_feeling	sd_post_feeling	n_pre	n_post
AnalysesEasier	4.104167	0.9139077	4.377778	0.7713786	144	135
OvercomeProblem	3.181818	1.0183967	3.807407	0.8149379	143	135
ProgrammingSoftware	2.542254	1.2182026	3.533333	0.9910043	142	135
RawData	4.416667	0.9274373	4.622222	0.8540218	144	135
SearchOnline	3.805556	0.8712805	4.281481	0.7595349	144	135

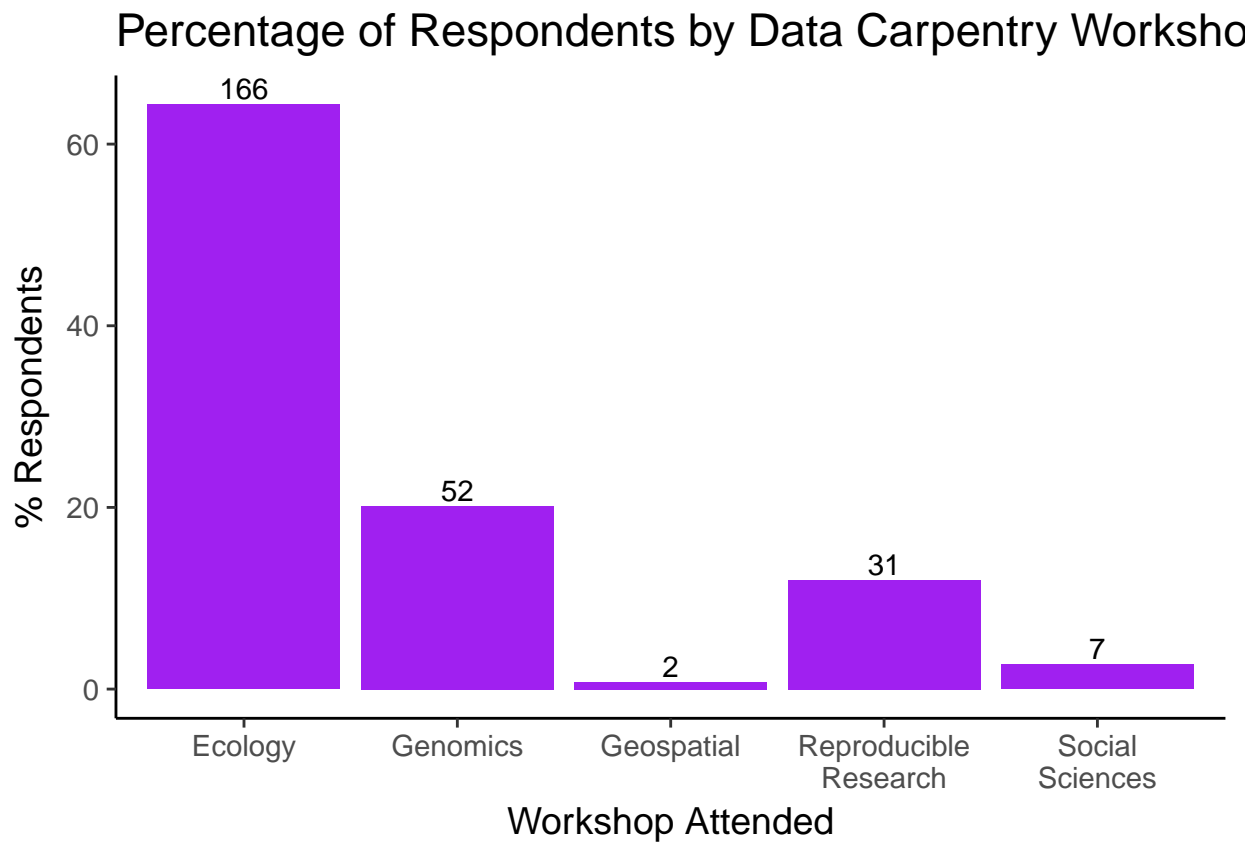
Demographic Data for U.S. Participants

With what gender do you most identify?

Gender Identity	n	%
Female	126	60
Male	82	39
Transgender female	1	0

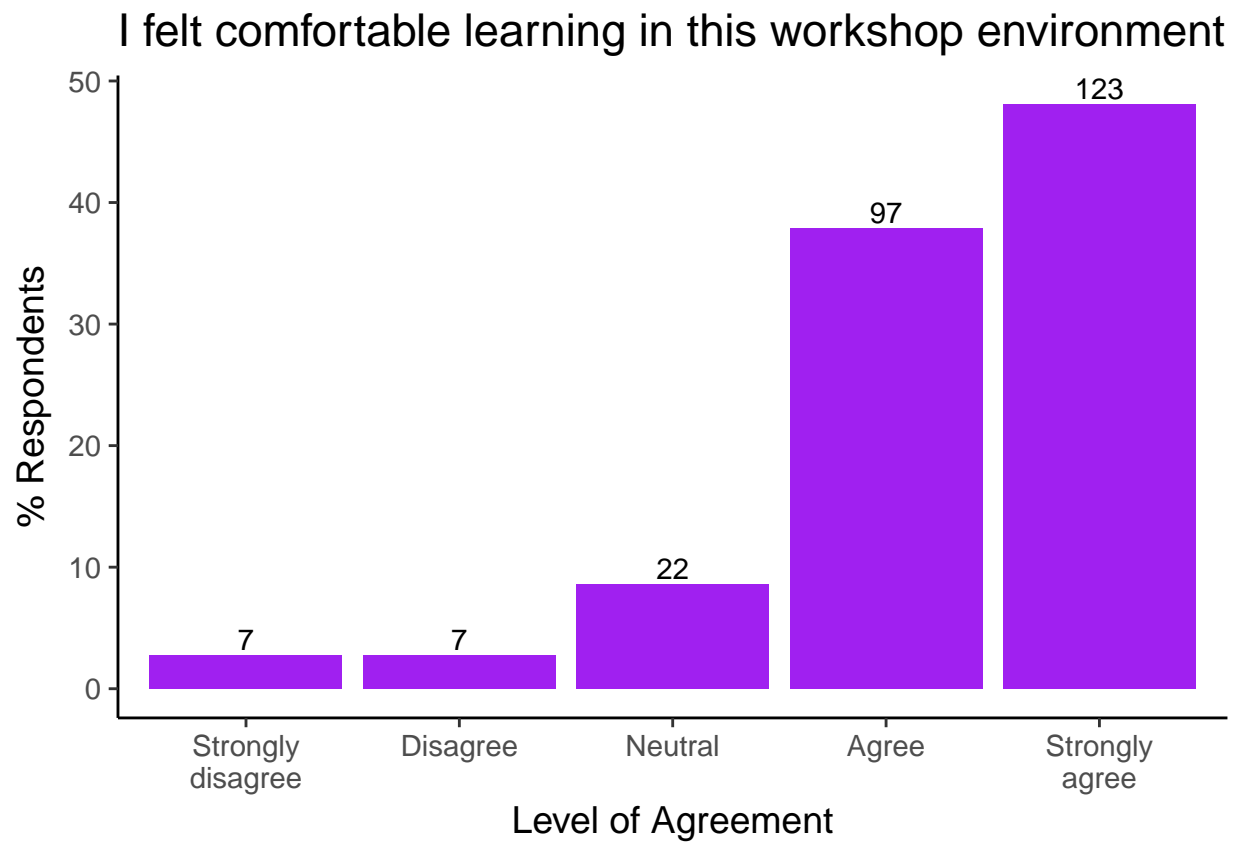
How would you describe yourself?

Data Carpentry (Post-Workshop)

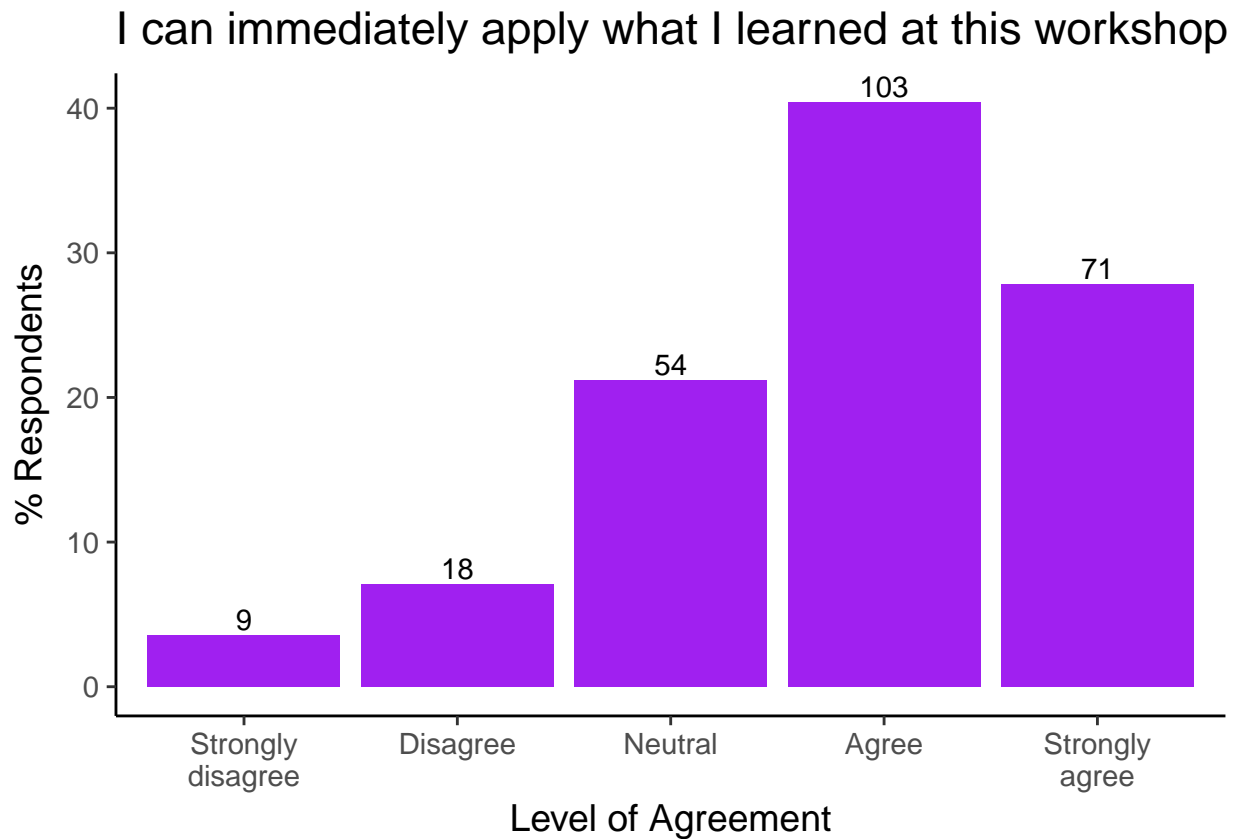


Perception of Workshop Atmosphere

I felt comfortable learning in this workshop environment.



I can immediately apply what I learned at this workshop



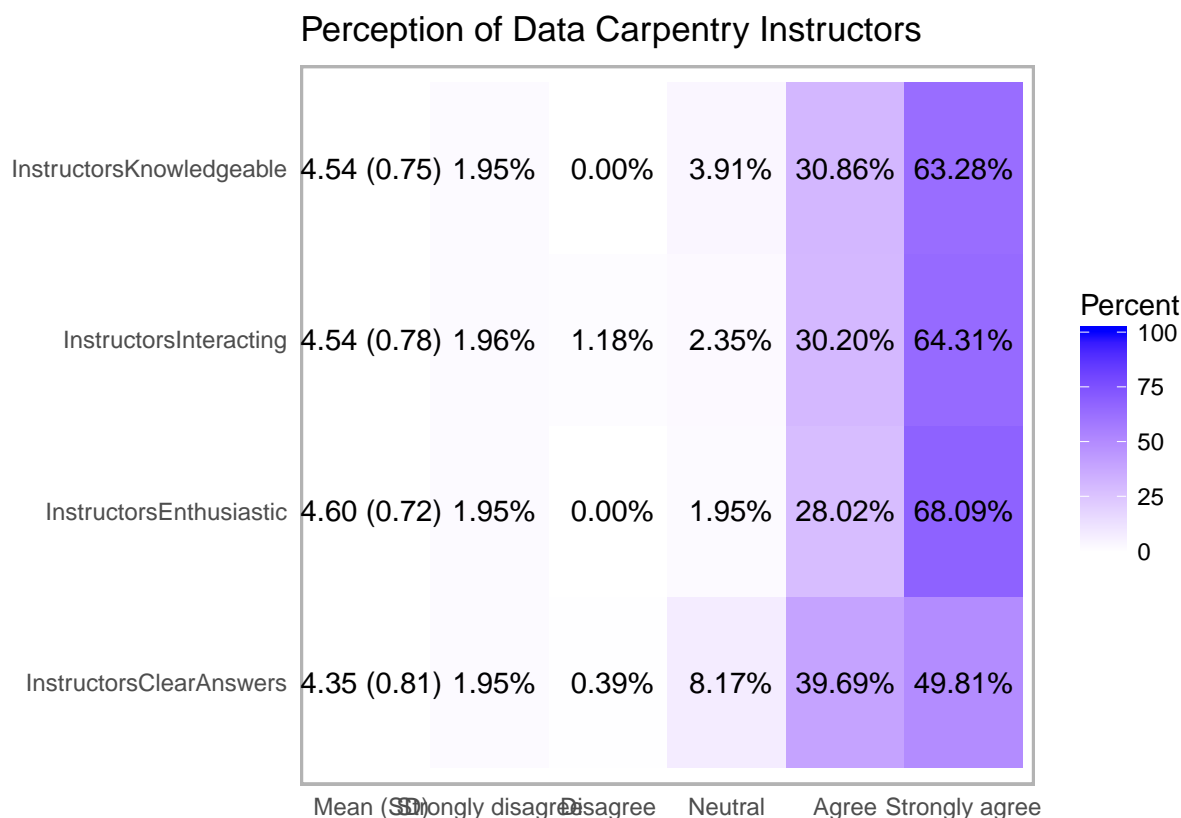
Were there any accessibility issues that affected your ability to participate in this workshop?

Accessibility Issues	n	%
No	225	88.2
Yes	30	11.8

Perception of Instructors and Helpers

Respondents were asked to rate their level of agreement with several statements regarding their instructor's knowledge, instructional method, and enthusiasm. Their responses are in the figure below, and axis labels corresponding to the statements are as follows:

- **InstructorsKnowledge:** The instructors were knowledgeable about the material being taught.
- **InstructorsEnthusiastic:** The instructors were enthusiastic about the workshop.
- **InstructorsComfortable:** I felt comfortable interacting with the instructors.
- **InstructorsClear:** I was able to get clear answers to my questions from the instructors.



Recommending Data Carpentry Workshops

Learners were asked how likely they are to recommend this workshop to a friend or colleague using the Net Promoter Score. The scoring for this question based on a 0 to 100 scale. Respondents scoring from 0 to 64 are labeled *Detractors*, and are believed to be less likely to recommend a workshop. Those who respond with a score of 85 to 100 are called *Promoters*, and are considered likely to recommend a workshop. Respondents between 65 and 84 are labeled *Passives*, and their behavior falls in the middle of Promoters and Detractors.

Promoter Score	n	%
Detractor	14	5.511811
Passive	49	19.291339
Promoter	191	75.196850

Software Carpentry (Pre-Workshop)

Pre-Workshop Survey Demographics: Workshop Location

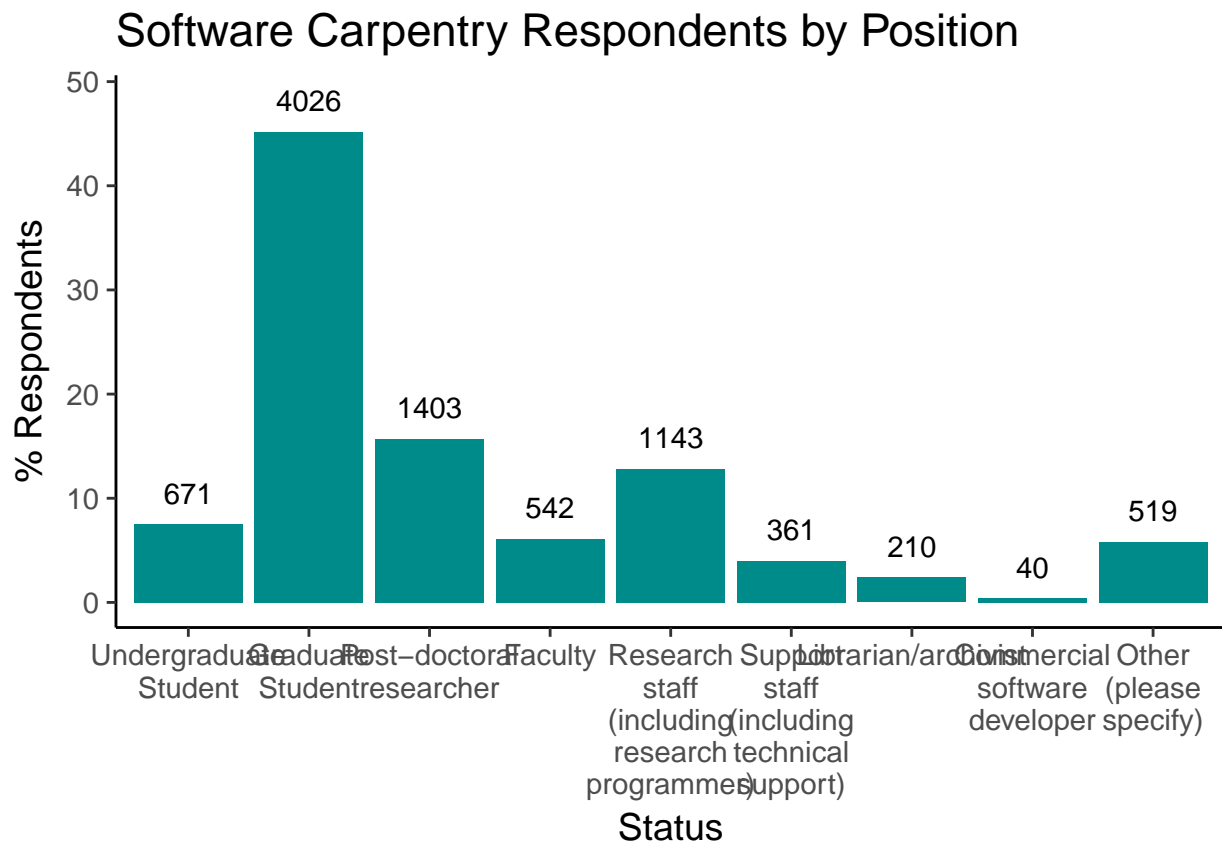
In Software Carpentry's pre-workshop survey, respondents are asked whether or not their workshop takes place in the United States.

SWC Workshops in US	n	%
Yes	5158	43.7

SWC Workshops in US	n	%
No	3957	33.6

Pre-Workshop Survey Demographics: Domain of Research/Work/Study

Software Carpentry's Respondents by Discipline	n	%
Life Sciences (Genetics, genomics, bioinformatics)	2254	21.4
Life Science - Organismal/systems (ecology, botany, zoology, microbiology, neuroscience)	2225	21.1
Mathematics/statistics	761	7.2
Physics	660	6.3
Planetary sciences (geology, climatology, oceanography, etc.)	645	6.1
Medicine and/or Pharmacy	554	5.2
Civil, mechanical, chemical, or nuclear engineering	540	5.1
Social sciences	463	4.4
Chemistry	446	4.2
Economics/business	384	3.6
Psychology	364	3.4
Library and information science	326	3.1
High performance computing	311	2.9
Humanities	268	2.5
Education	210	2.0
Space sciences	142	1.3

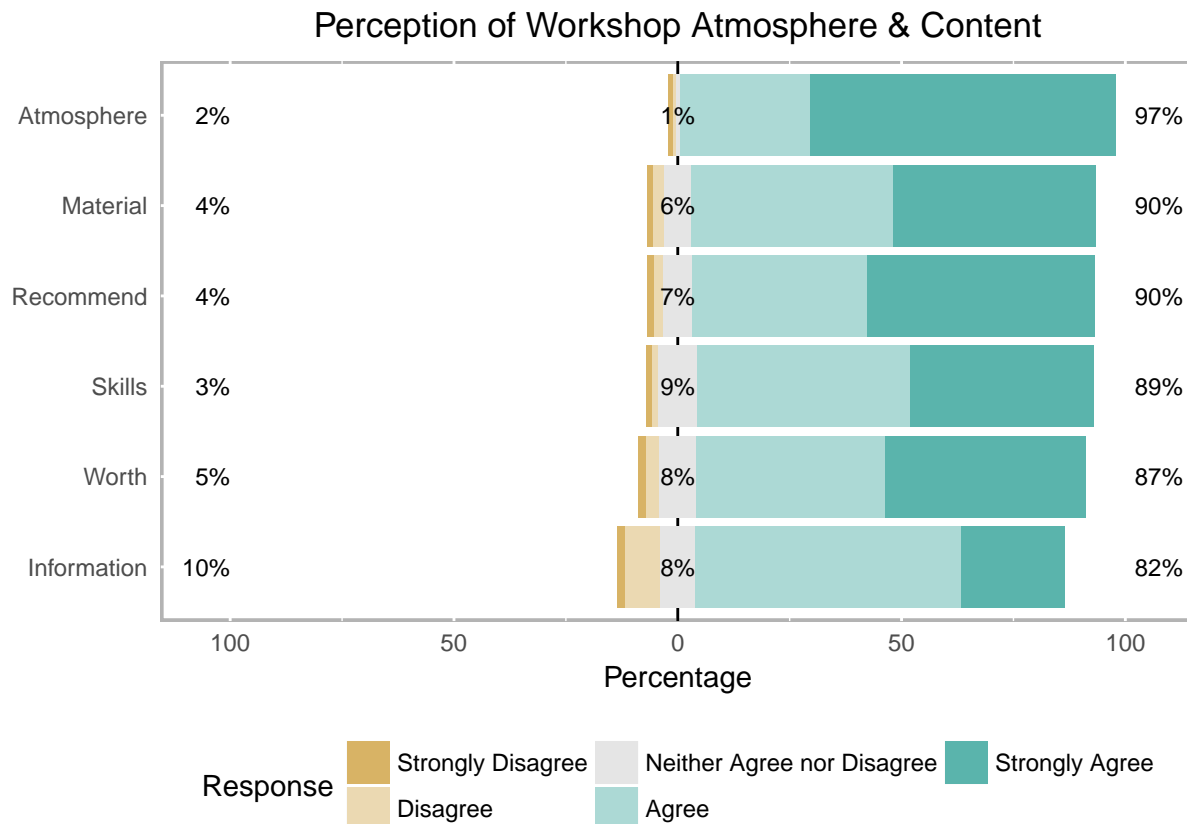


Software Carpentry (Post-Workshop)

Learners were asked to rate their level of agreement on a scale of 1 (Strongly Disagree) to 5 (Strongly Agree) for the following statements regarding the atmosphere and content of the workshop they attended:

- **Atmosphere:** The overall atmosphere of the workshop was welcoming.
- **Material:** The material presented matched the workshop description.
- **Recommend:** I would recommend this workshop to a friend/colleague.
- **Skills:** I learned skills that I will be able to use in my research/work.
- **Worth:** The workshop was worth my time.
- **Information:** The amount of information covered at the workshop was reasonable for allotted time.

The following Likert chart is an analysis of learner responses to the statements above.



Respondent Perception of Workshop Content and Atmosphere

Pace	n
Just right	1317
Slightly fast	1057
Slightly slow	730
Too fast	157
Too slow	164

Pace	n	
Respondents were asked	to indicate their perception of the balance of lecture to hands-on work in the workshop.	A break

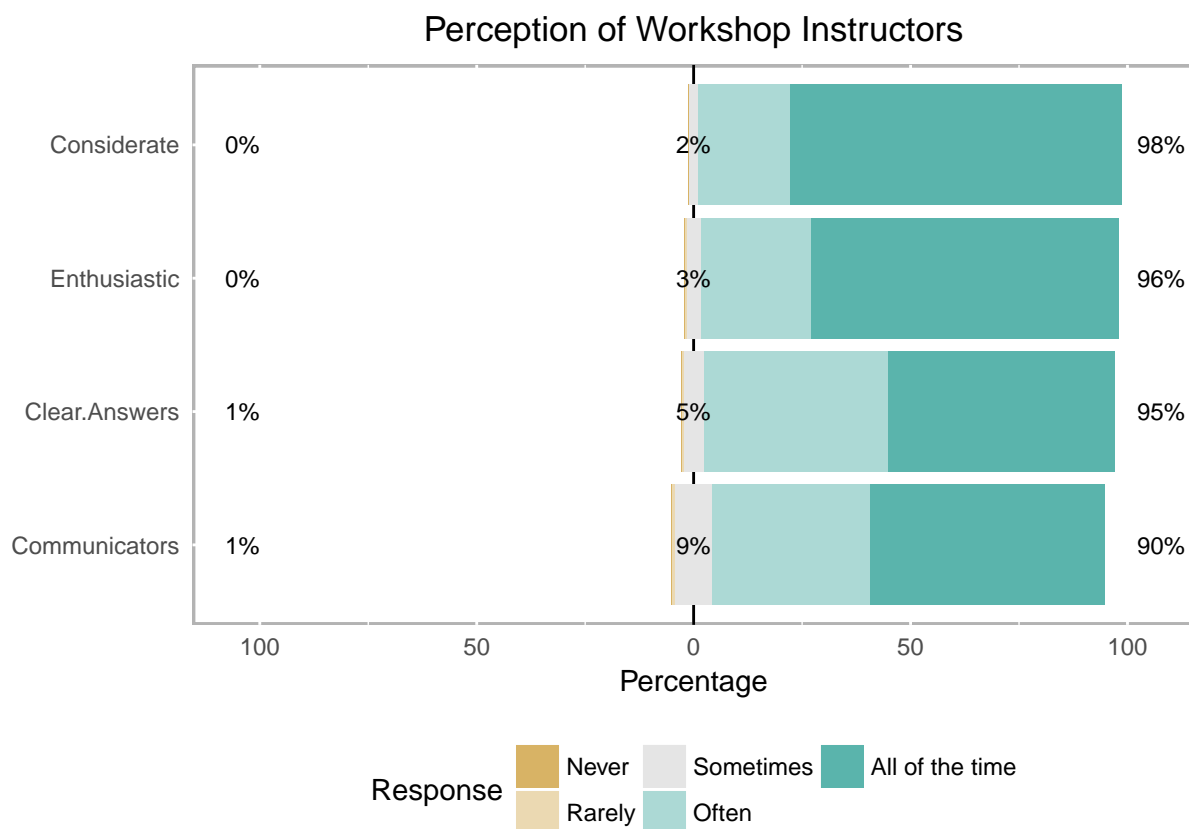
Balance: Lecture to Hands-On Work	n	%
Too much lecture	59	1.7
Slightly too much lecture	354	10.3
Balanced (lecture/hands-on)	2773	81.0
Slightly too much hands-on	204	6.0
Too much hands-on	35	1.0

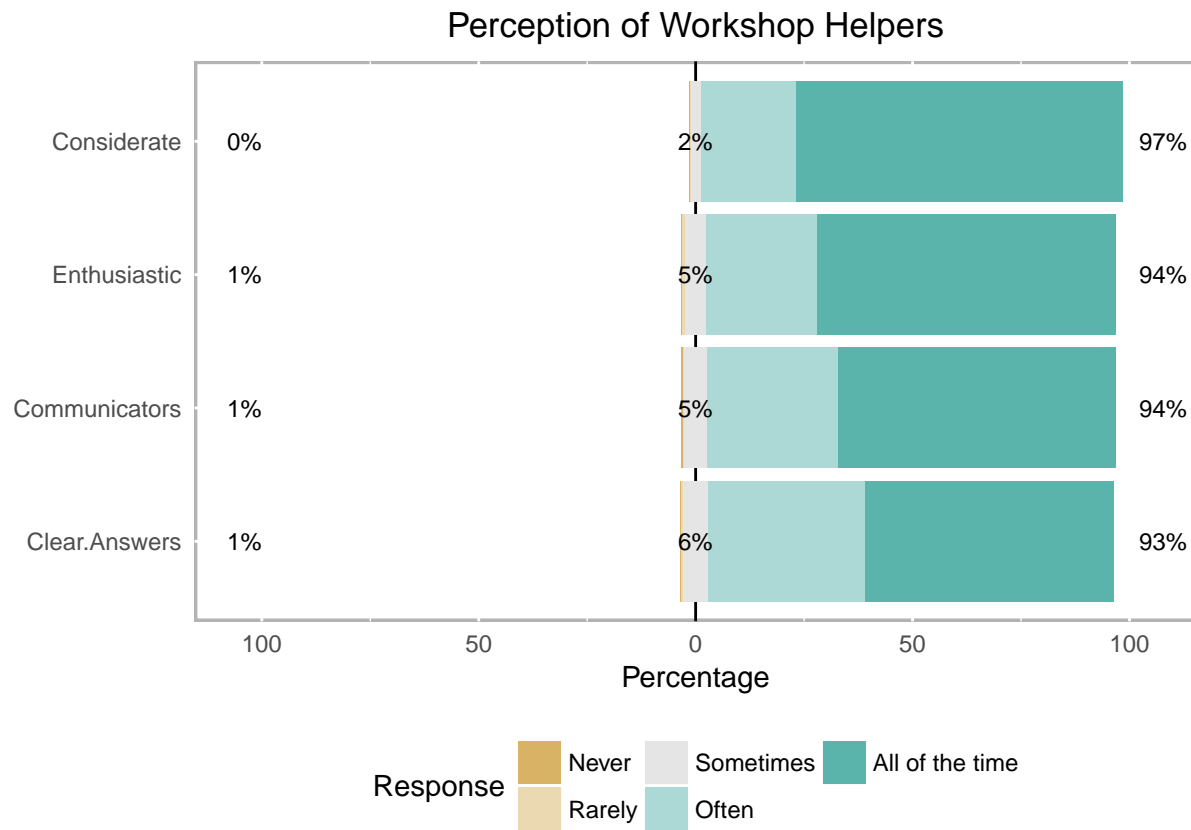
Respondent Perception of Workshop Instructors and Helpers

Respondents were asked to rate how they felt instructors and helpers worked as a team based on the following criteria:

- **Considerate:** Instructors/Helpers were considerate.
- **Enthusiastic:** Instructors/Helpers were enthusiastic.
- **Communicators:** Instructors/Helpers were good communicators.
- **Clear.Answers:** Instructors/Helpers gave clear answers to your questions.

The two Likert plots below provide an analysis of respondent answers.



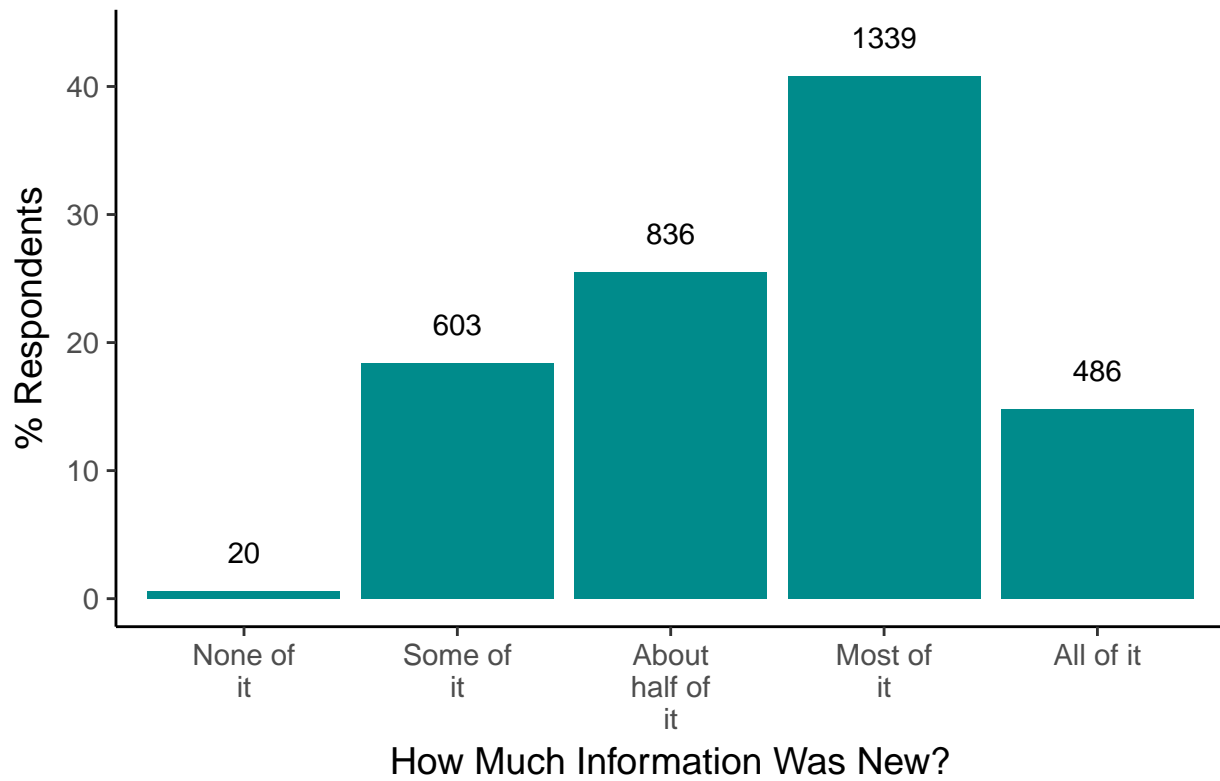


Were there enough helpers at the workshop?

94.1% of respondents felt there were enough helpers in the workshop they attended.

How much information was new?

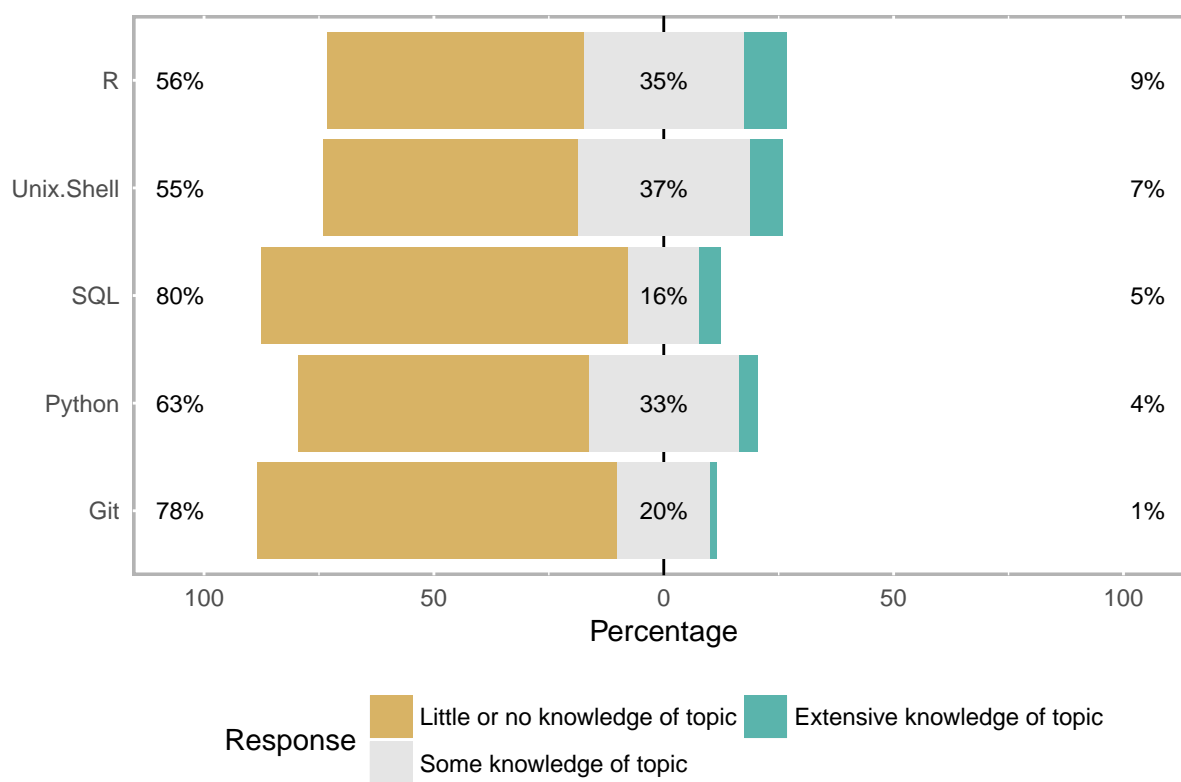
41 % Respondents Learned Mostly New Information



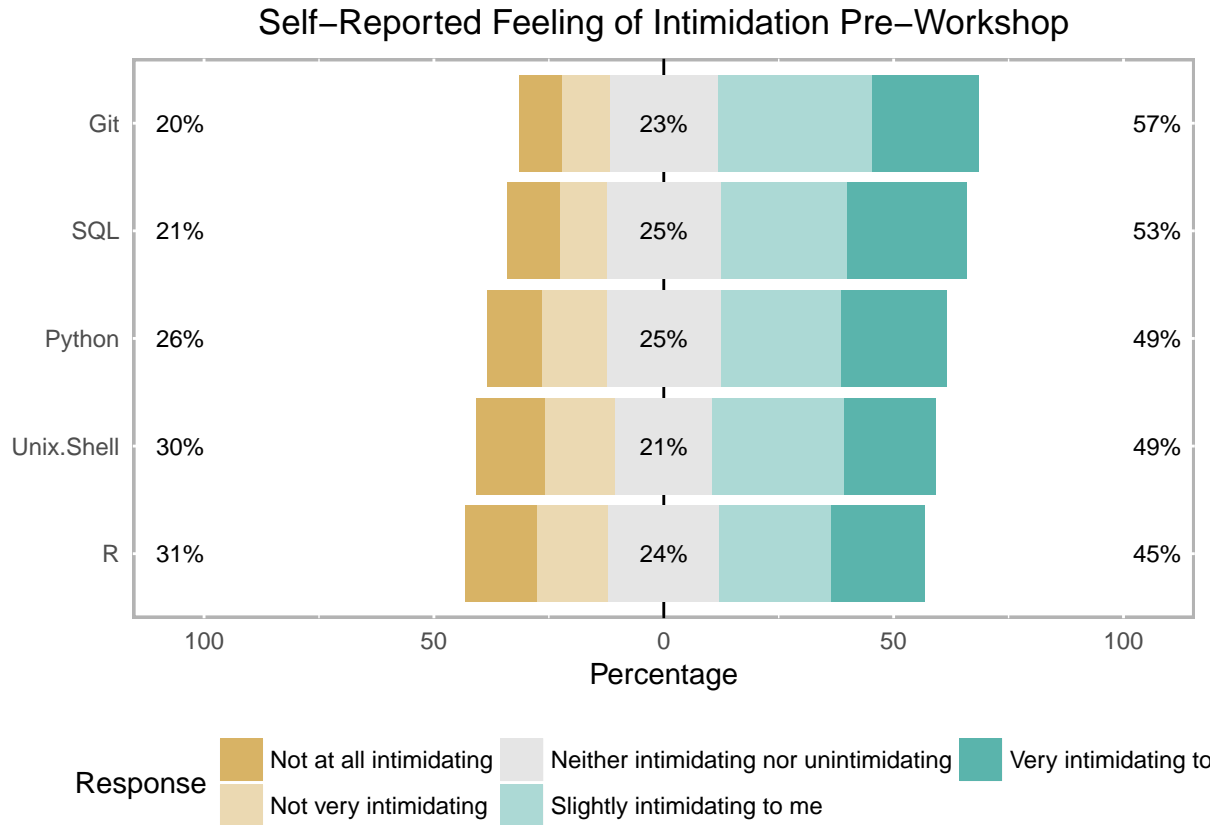
Experience with tools pre-workshop

Before the workshop tell us about your experience with these topics.

Self-Reported Knowledge of Tools Covered Pre-Workshop



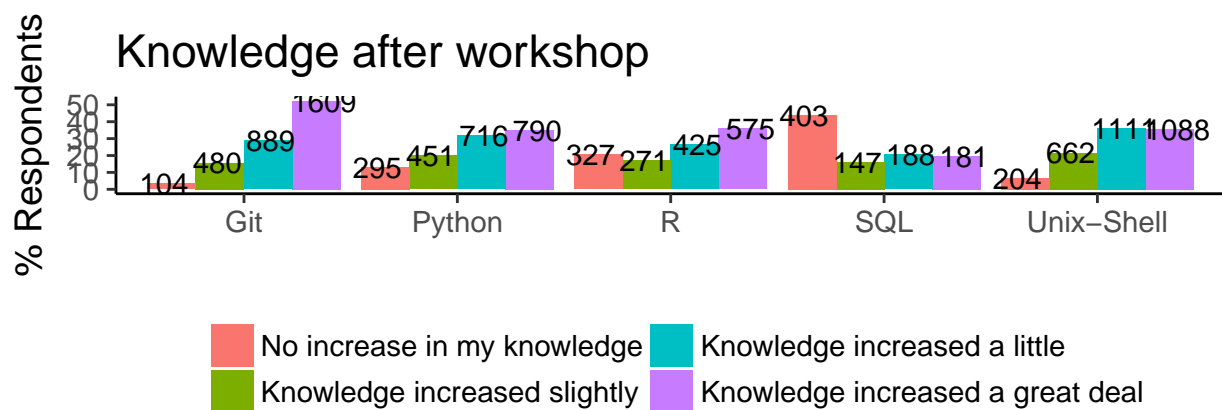
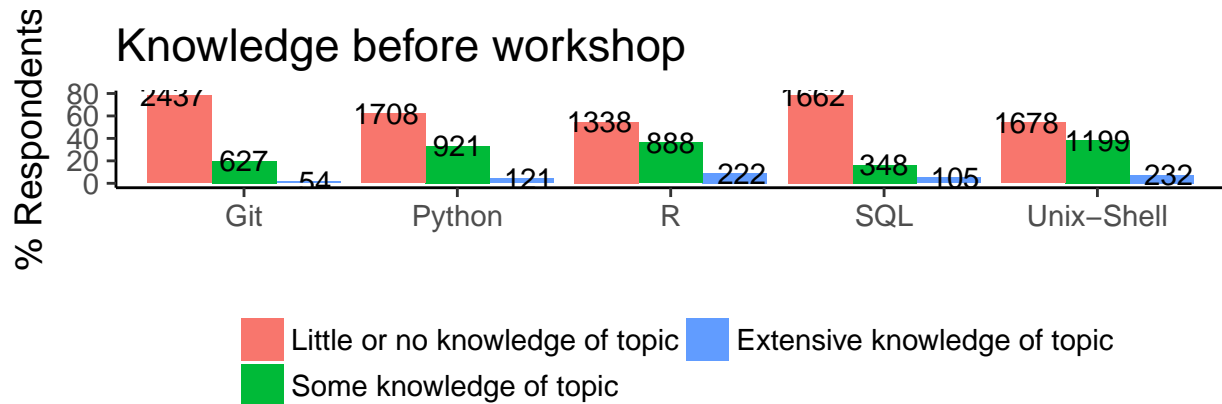
How intimidating were the tools before the workshop?



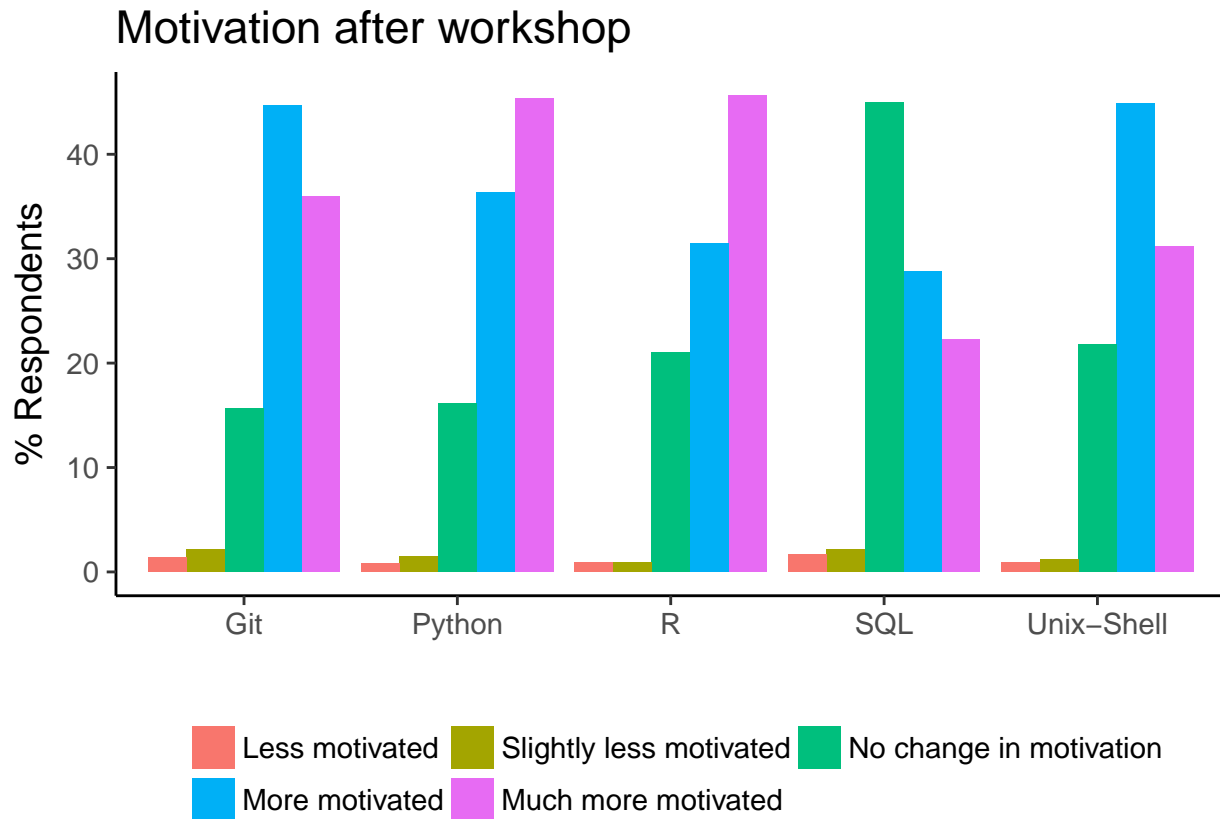
Self-Reported Knowledge Increase



Self-Reported Knowledge Increase: Pre/Post Comparison



Motivation to Learn Post-Workshop



Respondent Ability to Perform Computing Tasks

Motivation is important, but being confident in your ability to complete specific computing tasks is an equally important goal of Software Carpentry. The grid below shows respondents' self-reported ability to complete tasks including:

- Using pipes to connect shell commands
- Writing a 'for loop' to automate tasks
- Initializing a repository with git
- Writing a function
- Importing a library or package in R or Python
- Writing a unit test in Python or R
- Writing an SQL query

It also provides their self-reported level of confidence in being able to complete the tasks above after completing the workshop.

