[Report Year] Data Buddies Department Report
[University Name]

REPORT INFORMATION

This report presents data collected via The Computing Research Association's (CRA) Data Buddies survey during the end of the [starting semester] and the beginning of the [ending semester] academic semesters. The Data Buddies surveys are designed to assess experiences of students engaged in the computing community. This includes students who are pursuing a computing degree, as well as students who are simply taking computing courses while pursuing other degrees.

Report structure

This report compares data collected from your students to data from students at similar institutions. In this report, **"similar institutions"** are those whose computing departments award Ph.D.s. Data are presented by student population (i.e. undergraduate and graduate). For each population, we present:

- An executive summary page containing key findings about students in your department

- Detailed comparative tables for:

    - Your students and students at similar institutions

    - Women and men at your institution and at similar institutions

    - Students who are underrepresented in comptuing (BHN) and those who are not (AW) [1] at your institution and at other institutions.

If your institution did not have at least 5 respondents for a particular student group and/or does not have a particular student population (e.g., graduate students), there will be no content reported for that chapter.

Table layout

For each survey question, either a mean + standard deviation (SD) or a proportion (in percentage) is reported depending on the type of survey question. Sample sizes within each table are notated with 'n' in the bottom row of each table; 'n' indicates the number of students who responded to that specific chapter of the survey. Sample sizes may vary across tables because all survey questions were voluntary. Tables also present the results of inferential statistics assessing group differences (column labeled Sig.).

Statistical tests and reporting

Independent samples t-tests were used to assess group differences in means. A two-proportion z-test with unpooled variance was used to assess differences in proportions across groups.

For each statistical test, we indicate whether a comparison between two groups is "significant". Significance is determined using a two-step process. First, we assessed whether group differences meet the conventional $p \leq .05$ threshold for inferential statistics. Then, if the $p \leq .05$ threshold was met, we observed the effect size for the two-group comparison using Cohen's d for the independent samples t-tests and Cohen's h for the two-proportion z-tests. In the current report, group comparisons are only deemed "significant" if they reach the $p \leq .05$ threshold <u>and</u> their effect size is $\geq .30$ (indicating an effect size of "medium" or greater). For an explanation of why we use this two-step process and more information on how to interpret inferential statistics, see the Appendix.

More CERP data

Past Data Buddies data are also displayed on a data visualization page on the CRA's Center for Evaluating the Research Pipeline's (CERP) website `http://cra.org/cerp/data-visualization`. CERP also publishes monthly infographics in the Computing Research Newsletter (`https://cra.org/crn/tag/cerp-infographics/`). Subscribe to CERP's newsletter at `https://cra.org/cerp/email-list`. For parties interested in working with CERP data, a data request application can be completed at `https://cra.org/cerp/cerp-data-request/`.

Thank you for contributing data to the CRA's Data Buddies Project! Your students' data help the computing community better understand correlates of persistence and success among computing students.

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[1]BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Na- tive/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students

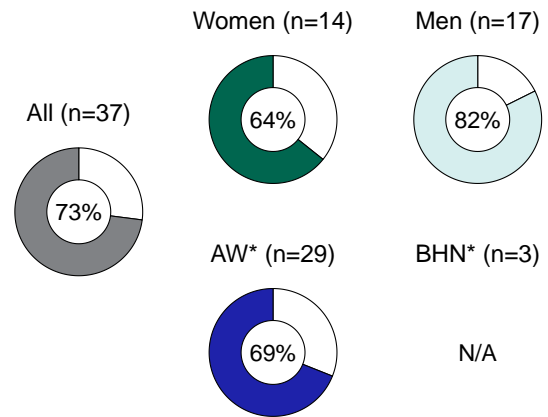# Report Highlights: Undergraduate Students

March 2, 2021

Reasons for selecting a computing major

At your institution, the following are the top five reasons why students selected, or are considering to select a computing major.

1. I like learning about computing
2. The job market for the computing field is promising
3. A computing major will allow me to make an impact on society
4. A computing major will enable me to make a lot of money
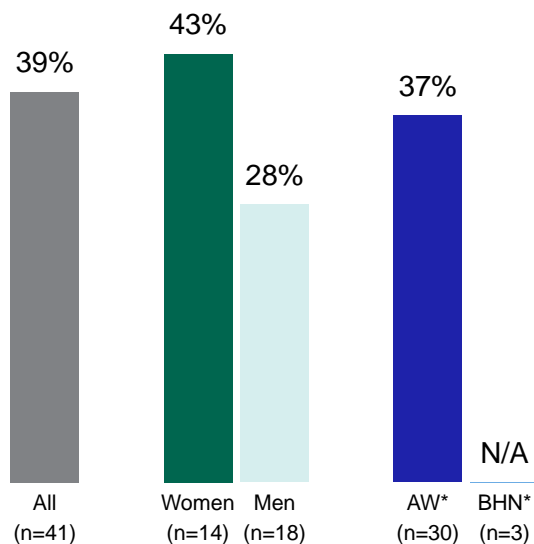5. The courses required of the computing major are interesting

Satisfaction with the computing program

At your institution, the following are satisfied with the computing program:

Women (n=14) Men (n=17)

All (n=37)

64% 82%

73%

AW* (n=29) BHN* (n=3)

69% N/A

Thoughts about leaving computing major

At your institution, the following thought about leaving their computing major:

39% 43% 28% 37% N/A

All (n=41) Women (n=14) Men (n=18) AW* (n=30) BHN* (n=3)

Why did you consider leaving computing?

At your institution, the following are the top five reasons why students considered leaving their computing major.

1. The courses were difficult
2. I did not like the course material
3. I was interested in trying something new
4. The math requirements were too hard
5. I was having trouble passes my courses

See full report for benchmarking on these topics and more!

* **BHN**: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities **AW**: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students

N/A: $n < 5$ for the group for the specific question.

+ The calculations are independent for All Students, for Women/Men, and for BHN/AW.

Report Highlights: Graduate Students
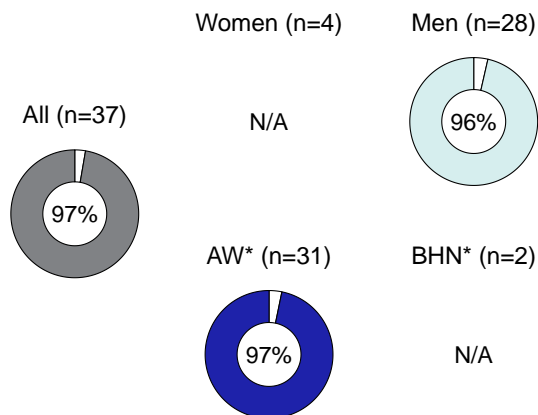
March 2, 2021

Reasons for selecting a computing related graduate program

At your institution, the following are the top five reasons why students selected, or are considering to select a graduate program in a computing field.

1. I want to pursue research in this field
2. I like learning about this field
3. Professors/faculty at my institution influenced my decision
4. I aspire to make a difference in this field
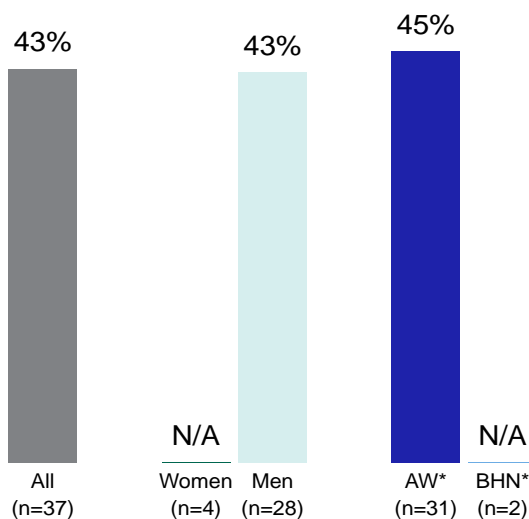5. The job market for this field is promising

Satisfaction with the computing program

At your institution, the following are satisfied with the computing program:

Women (n=4)   Men (n=28)

All (n=37)   N/A   96%

97%

AW* (n=31)   BHN* (n=2)

97%   N/A

Thoughts about leaving computing program

At your institution, the following thought about leaving their graduate program in computing program:

43%	N/A	43%	45%	N/A
All (n=37)	Women (n=4)	Men (n=28)	AW* (n=31)	BHN* (n=2)

Why did you consider leaving computing?

At your institution, the following are the top five reasons why students considered leaving their computing program.

1. I felt isolated in my program
2. The courses were difficult
3. The professors were not supportive
4. I experienced health issues that inhibited my ability to feel/be successful
5. The math requirements were too hard

See full report for benchmarking on these topics and more!

* **BHN**: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities **AW**: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students

N/A: $n < 5$ for the group for the specific question.

+ The calculations are independent for All Students, for Women/Men, and for BHN/AW.

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Part I

Undergraduate Students

Chapter 1

Undergraduate Students: General Results

1.1 Student Background

Table 1.1.1 Which of the following experiences did you have prior to entering college?
Select all that apply

	Your Institution (%)	Similar Institutions (%)	Sig.
Took AP Computer Science A	47%	35%	
Took AP Computer Science Principles	11%	11%	
Took other AP courses	51%	51%	
Took dual enrollment courses	4%	18%	*
Learned a computer programming language	44%	52%	
Engaged in software or hardware related projects	29%	34%	
Took part in student groups related to computing	18%	23%	
Completed an online course related to computing (e.g., MOOC)	0%	11%	*
Attended a workshop or other training in computing (e.g., through your local library, community center, etc.)	9%	12%	
None of the above	13%	17%	
n	45	9577	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.1.2 Which of the following mathematics courses did you take prior to entering college?
Select all that apply

	Your Institution (%)	Similar Institutions (%)	Sig.
Algebra I	93%	92%	
Algebra II	96%	90%	
Trigonometry	80%	76%	
Pre-calculus	96%	88%	
Calculus	100%	78%	*
Statistics	60%	39%	*
None of the above	0%	1%	
n	45	9588	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.1.3 Which of the following applies to you?
Select all that apply

	Your Institution (%)	Similar Institutions (%)	Sig.
I temporarily withdrew from my current institution	5%	2%	
I transferred from a 2-year institution to my current institution	0%	10%	
I transferred from a 4-year institution to my current institution	2%	6%	
I have taken courses for credit at a community college	5%	21%	*
I have completed a degree/certification at a community college	2%	5%	
None of the above	88%	68%	*
n	43	9069	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.1.4 In what year do you expect to complete your current degree program?

	Your Institution (%)	Similar Institutions (%)	Sig.
2019	2%	3%	
2020	28%	23%	
2021	37%	26%	
2022	33%	27%	
2023	0%	21%	*
2024	0%	1%	
2025 or later	0%	0%	
n	43	9133	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.1.5 Have you experienced any economic hardships during your program that made you consider, or led you to, a leave of absence?

	Your Institution (%)	Similar Institutions (%)	Sig.
Yes	2%	18%	*
n	42	9064	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.1.6 Do you have any type of disability (e.g., physical, learning, mental, etc.)?

	Your Institution (%)	Similar Institutions (%)	Sig.
Yes	3%	10%	
n	35	7202	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

1.2 Entering and Exiting the Field

Table 1.2.1 Why did you choose your degree program?
Choose up to 3 responses.

	Your Institution (%)	Similar Institutions (%)	Sig.
I like learning about this field	78%	78%	
My friends are enrolled in this program	14%	6%	
The courses required of this program are interesting	22%	36%	
Professors/faculty at my institution influenced my decision	11%	4%	
The program will allow me to make an impact on society	44%	35%	
This program will enable me to make a lot of money	42%	38%	
The job market for this field is promising	61%	62%	
My family influenced my decision	6%	12%	
I will be successful completing the coursework required of this program	14%	11%	
Another reason	0%	3%	
None of the above	0%	0%	
n	36	8165	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.2.2 During your studies at your current institution, how often have you considered leaving your degree program before completing it?
(1) Never - (5) All the time

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
During your studies at your current institution, how often have you considered leaving your degree program before completing it?	1.71 (1.05)	1.78 (0.99)	
n	41	8542	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.2.3 Why did you think about leaving computing?
Choose up to 3 responses.

	Your Institution (%)	Similar Institutions (%)	Sig.
The courses were difficult	50%	47%	
The math requirements were too hard	19%	13%	
I was interested in trying something new	31%	26%	
I did not like the course material	38%	21%	
I was having trouble passes my courses	12%	21%	
I did not have any friends in the major	6%	9%	
The professors were not supportive	0%	11%	
I felt isolated in my program	12%	26%	
The department did not make me feel welcome	6%	8%	
I experienced health issues that inhibited my ability to feel/be successful	6%	15%	
Another reason	25%	21%	
None of the above	0%	1%	
n	16	4135	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.2.4 What helped you continue in your program when you were contemplating leaving?
Choose up to 3 responses.

	Your Institution (%)	Similar Institutions (%)	Sig.
My family encouraged/supported me	31%	37%	
My friends encouraged/supported me	25%	33%	
Professors/faculty encouraged/supported me	25%	11%	
I had already invested too much time and resources	62%	64%	
I liked the field of study	38%	51%	
The job market is promising	56%	46%	
Another reason	6%	7%	
None of the above	0%	1%	
n	16	4107	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

1.3 Perceptions of the Department

Table 1.3.1 Please indicate the extent to which you disagree or agree with the following statements.
(1) Strongly disagree - (5) Strongly agree

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
Overall, I am satisfied with the computing program at my institution	3.76 (1.04)	3.94 (1.01)	
I would recommend taking computing courses at my institution to a friend	4.11 (0.88)	4.02 (1.01)	
The number of students in my computing classes is too large	3.70 (1.05)	3.27 (1.14)	*
I am satisfied with the technical content of the computing courses	3.73 (0.93)	3.86 (0.95)	
The computing courses at my institution are too difficult	2.95 (1.13)	2.81 (1.05)	
n	37	7895	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.3.2 How dissatisfied or satisfied are you with the following aspects of the computing program at your institution?
(1) Very dissatisfied - (5) Very satisfied

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
The variety of computing courses offered	2.89 (1.29)	3.77 (1.04)	*
Access to academic resources needed to do your work	3.76 (0.98)	3.89 (0.98)	
The availability of professors/instructors outside of class (e.g., office hours, answering questions via email, etc.)	3.81 (1.02)	3.91 (1.02)	
How well the program has prepared you for your future career	3.43 (1.09)	3.61 (1.00)	
The workload expected of you	3.30 (0.97)	3.41 (1.04)	
n	37	7900	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.3.3 Rate how you feel about the environment of the department of your computing program.
(1) Strongly disagree - (5) Strongly agree

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
I feel a sense of community in the computing department	2.86 (1.08)	3.39 (1.13)	*
People in the department often attribute my success to special treatment or luck, rather than my competence	2.14 (1.03)	2.16 (1.12)	
The environment in the computing department inspires me to do the best job that I can	3.11 (1.02)	3.49 (1.02)	*
My ideas or opinions are minimized or ignored	2.46 (1.10)	2.34 (1.07)	
The department cares about its students	3.86 (0.82)	3.84 (1.03)	
The department is NOT very supportive of its students	2.24 (0.83)	2.20 (1.10)	
Computer science administrators (e.g., the department chair, dean, staff) and faculty care about diversity	3.62 (0.76)	3.71 (0.95)	
n	37	7797	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.3.4 Do you have access to one or more academic advisor(s)?
Select all that apply

	Your Institution (%)	Similar Institutions (%)	Sig.
Yes, I have an academic advisor(s) affiliated with the computing department	73%	82%	
Yes, I have an academic advisor(s) affiliated with another department	30%	30%	
No, I do not have an advisor yet	5%	6%	
n	37	7703	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.3.5 About how many times per semester/quarter do you interact with academic advisor(s) for the following reasons?
(1) Never - (5) Four or more times

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
Course-related guidance	1.97 (0.79)	2.23 (0.73)	
Career advice	1.34 (0.59)	1.62 (0.79)	*
Graduate school advice	1.26 (0.56)	1.42 (0.71)	
Another reason	1.31 (0.58)	1.58 (0.82)	*
n	35	6925	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.3.6 How dissatisfied or satisfied are you with the following?
(1) Very dissatisfied - (5) Very satisfied

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
How often you meet with your advisor(s)	3.26 (1.01)	3.43 (1.14)	
The academic guidance your advisor(s) provides	3.03 (1.01)	3.53 (1.20)	*
The career advice your advisor(s) provides	3.09 (1.04)	3.33 (1.13)	
n	35	7170	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

1.4   Support Structures

Table 1.4.1 Approximately how often do you interact with the following individuals?
(1) Never - (5) More than 3 times per week

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
Teaching assistants	3.22 (0.92)	3.10 (1.16)	
An instructor/faculty member outside of lecture regarding a course	2.38 (0.92)	2.43 (1.04)	
An instructor/faculty member outside of lecture NOT regarding a course	2.03 (1.07)	1.80 (1.03)	
Classmates outside of lecture	4.30 (1.10)	3.98 (1.20)	
n	37	7512	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.4.2 How often to you receive the following from other students if you need it?
(1) Not at all - (5) Very much

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
Help and support	3.56 (1.11)	3.57 (1.11)	
Willingness to listen to issues you are having at school	3.53 (1.25)	3.45 (1.18)	
Feedback about your work	3.25 (1.18)	3.34 (1.17)	
n	36	7755	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.4.3 To what extent do you have a mentor who:
(1) Not at all - (5) Very much

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
helps you improve your computing skills	2.22 (1.29)	2.38 (1.38)	
shows compassion for any issues you discussed with them	2.73 (1.43)	2.81 (1.47)	
shares personal experiences as an alternative perspective to your problem	2.41 (1.36)	2.70 (1.46)	
explores career options with you	2.41 (1.40)	2.52 (1.42)	
encourages you to do the best you can in your coursework	2.65 (1.42)	2.87 (1.52)	
supports your research ideas	2.25 (1.32)	2.38 (1.42)	
n	36	7500	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.4.4 Think about your relationships in computing. To what extent is each of the following available to you at this point?
(1) Not at all - (5) Very much

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
People with whom you can discuss professional development questions	3.55 (1.01)	3.41 (1.13)	
People with whom you can discuss graduate school opportunities	3.34 (1.02)	3.14 (1.20)	
A strong network of peers to interact with at conferences	2.79 (1.23)	2.84 (1.24)	
A strong network of mentors to interact with at conferences	2.42 (1.15)	2.65 (1.25)	
People who would be excited to learn about your professional successes	3.37 (1.08)	3.24 (1.19)	
People with whom you can discuss issues you are having	3.16 (1.13)	3.37 (1.16)	
n	38	8142	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

1.5   Self-perceptions

Table 1.5.1 Please indicate the extent to which you disagree or agree with the following statements.
(1) Strongly Disagree - (5) Strongly Agree

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
I see myself as a computing person	3.82 (0.97)	3.94 (0.98)	
I feel like I belong in computing	3.51 (1.10)	3.73 (1.07)	
I feel like an outsider in computing	2.54 (1.31)	2.49 (1.19)	
Computing is a big part of who I am	2.90 (1.19)	3.36 (1.15)	*
I feel welcomed in computing	3.38 (0.96)	3.64 (0.99)	
I do not have much in common with the other students in my computing classes	2.74 (1.16)	2.76 (1.13)	
n	39	8295	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.5.2 In your opinion, to what extent are each of the following statements true of you?
(1) Not at all - (5) Very much

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
I can give the impression that I'm more competent than I really am	3.54 (1.28)	3.29 (1.21)	
When others praise me for something I have accomplished, I'm afraid I won't be able to live up to their expectations of me in the future	3.19 (1.37)	3.31 (1.29)	
At times, I feel my success has been due to some kind of luck	3.49 (1.26)	3.14 (1.33)	
I'm disappointed at times in my present accomplishments and think I should have accomplished much more by now	3.49 (1.30)	3.47 (1.30)	
n	37	8012	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.5.3 I am confident that I can:
(1) Strongly disagree - (5) Strongly agree

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
pass my computing courses	4.51 (0.69)	4.40 (0.83)	
learn the foundations and concepts of computing	4.46 (0.80)	4.48 (0.72)	
do well in a computing-related contest (e.g., programming contest, robotics contest, hackathon)	2.95 (1.22)	3.46 (1.16)	*
quickly learn a new programming language on my own	3.92 (1.04)	3.94 (1.03)	
contribute to a research project in computing	3.46 (1.07)	3.65 (1.07)	
clearly communicate technical problems and solutions to a range of audiences	3.92 (1.05)	3.94 (0.96)	
articulate thoughtful answers to theoretical questions about your work during a presentation	3.86 (1.17)	3.96 (0.94)	
introduce myself to new peers/colleagues at professional meetings	3.83 (1.16)	3.96 (1.03)	
be a capable researcher in computing	3.28 (1.09)	3.50 (1.08)	
find employment in an area of computing interest	3.89 (1.09)	4.07 (0.94)	
complete an undergraduate degree in computing	4.68 (0.71)	4.55 (0.81)	
get admitted to a graduate computing program	3.65 (1.14)	3.75 (1.07)	
be successful in a graduate computing program	3.57 (1.09)	3.74 (1.07)	
n	37	8082	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.5.4 In your opinion, to what extent would a career in computing allow you to do the following.
(1) Not at all - (5) Extremely

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
Serve humanity	3.66 (0.85)	3.59 (1.04)	
Be in a position of influence in society	3.66 (1.02)	3.47 (1.11)	
Spend at lot of time with family	3.34 (0.85)	3.26 (1.00)	
n	41	8575	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

1.6 Activities

Table 1.6.1 How often have you been involved in each of the following groups or activities?
(1) Never - (5) Four or more times

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
Internships related to computing	2.03 (1.02)	1.71 (0.90)	
Jobs related to computing	1.36 (0.82)	1.46 (0.82)	
Career mentoring programs or workshops	1.79 (0.99)	1.56 (0.89)	
Outreach to K-12 students related to computing	1.48 (0.91)	1.51 (0.93)	
Computing-related student groups (e.g., technical organizations on campus, ACM student chapters, etc.)	2.18 (1.07)	1.95 (1.04)	
Other student groups (e.g., Greek Life, volunteer groups, academic merit societies, etc.)	2.48 (1.12)	2.02 (1.13)	*
n	33	7327	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.6.2 How often have you been involved in each of the following groups or activities?
(1) Never - (5) Four or more times

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
Submitted a poster proposal to a conference	1.32 (0.68)	1.19 (0.55)	
Submitted a paper proposal to a conference	1.32 (0.68)	1.15 (0.50)	
Submitted a paper for publication in a peer reviewed journal	1.21 (0.54)	1.13 (0.48)	
Presented a poster at a conference	1.35 (0.81)	1.18 (0.54)	
Given an oral presentation at a conference	1.24 (0.61)	1.19 (0.55)	
Had a paper accepted for publication in conference proceedings	1.15 (0.44)	1.12 (0.46)	
Had a paper accepted for publication in a peer reviewed journal	1.12 (0.41)	1.12 (0.46)	
n	34	7326	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.6.3 During your academic career to date, have you participated in any of the following conferences or programs?
Select all that apply

	Your Institution (%)	Similar Institutions (%)	Sig.
ACM Richard Tapia Celebration of Diversity in Computing	3%	2%	
Grace Hopper Celebration of Women in Computing	19%	4%	*
Local events related to diversity in computing	9%	8%	
None of these	72%	87%	*
n	32	6505	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.6.4 During your academic career to date, have you pursued any of the following resources at your institution?
Select all that apply

	Your Institution (%)	Similar Institutions (%)	Sig.
Peer tutoring	21%	31%	
Tutoring offered by your department/college	21%	27%	
Peer mentoring	9%	18%	
Career counseling	21%	20%	
Mental health counseling	29%	17%	
Does not apply to me	41%	41%	
n	34	7091	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

1.7 Future Plans and Interests

Table 1.7.1 For your future career, in which setting would you like to work the most?

	Your Institution (%)	Similar Institutions (%)	Sig.
Academia	3%	9%	
Industry	82%	64%	*
Government	8%	9%	
Self-employment	5%	14%	
Something else	3%	4%	
n	39	8558	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.7.2 How interested are you in having a career:
(1) Not at all interested - (5) Extremely interested

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
doing computing-related work	3.87 (0.95)	4.17 (0.97)	
in computing research	2.69 (1.28)	2.87 (1.22)	
n	39	8548	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.7.3 How interested are you in having the types of jobs listed below after you finish your highest degree?
(1) Very uninterested - (5) Very interested

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
College or university professor in computing field (teaching focused)	2.55 (1.50)	2.56 (1.34)	
College or university professor in computing field (research focused)	2.39 (1.50)	2.49 (1.31)	
K-12 computing teacher	2.29 (1.45)	2.07 (1.22)	
Computing researcher in industry	2.66 (1.53)	3.10 (1.28)	
Computing researcher in a government lab or agency	2.61 (1.42)	2.96 (1.29)	
A non-research computing position in industry (e.g., software engineer)	3.89 (1.25)	4.12 (1.06)	
A non-research computing position in government	2.92 (1.30)	3.32 (1.26)	
Entrepreneur (computing related; e.g., individual contractor, build a start-up)	3.76 (1.16)	3.46 (1.28)	
Non-computing career	2.79 (1.30)	2.50 (1.27)	
n	38	8375	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.7.4 What is the highest degree you plan to attain?

	Your Institution (%)	Similar Institutions (%)	Sig.
Associate's degree	0%	0%	
Bachelor's degree	29%	38%	
Master's degree	49%	46%	
Doctoral degree	22%	16%	
None of the above	0%	0%	N/A
n	41	8720	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 1.7.5 Do you intend to earn/ have your earned your highest degree in a computing-related field?

	Your Institution (%)	Similar Institutions (%)	Sig.
No	28%	17%	
Yes	72%	83%	
n	40	8568	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Chapter 2

Undergraduate Students: Results by Gender

Data for individuals who do not identify as either a woman or a man are not included in this report due to small samples sizes.

2.1 Student Background

Table 2.1.1 Which of the following experiences did you have prior to entering college?
Select all that apply

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	(%)	(%)	Sig.	(%)	(%)	Sig.
Took AP Computer Science A	50%	61%		32%	36%	
Took AP Computer Science Principles	7%	6%		10%	11%	
Took other AP courses	64%	44%		55%	51%	
Took dual enrollment courses	0%	6%		20%	19%	
Learned a computer programming language	50%	44%		47%	57%	
Engaged in software or hardware related projects	29%	33%		28%	40%	
Took part in student groups related to computing	21%	17%		23%	25%	
Completed an online course related to computing (e.g., MOOC)	0%	0%	N/A	9%	13%	
Attended a workshop or other training in computing (e.g., through your local library, community center, etc.)	7%	11%		14%	12%	
None of the above	0%	17%		18%	16%	
n	14	18		2472	4593	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.1.2 Which of the following mathematics courses did you take prior to entering college?
Select all that apply

	Your Institution			Similar Institutions		
	Women (%)	Men (%)	Sig.	Women (%)	Men (%)	Sig.
Algebra I	100%	83%		94%	92%	
Algebra II	100%	89%		92%	91%	
Trigonometry	79%	78%		77%	77%	
Pre-calculus	100%	89%		90%	87%	
Calculus	100%	100%	N/A	81%	76%	
Statistics	71%	39%		39%	38%	
None of the above	0%	0%	N/A	1%	1%	
n	14	18		2476	4600	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.1.3 Which of the following applies to you?
Select all that apply

	Your Institution			Similar Institutions		
	Women (%)	Men (%)	Sig.	Women (%)	Men (%)	Sig.
I temporarily withdrew from my current institution	14%	0%		2%	3%	
I transferred from a 2-year institution to my current institution	0%	0%	N/A	7%	12%	
I transferred from a 4-year institution to my current institution	0%	0%	N/A	5%	6%	
I have taken courses for credit at a community college	0%	11%		21%	22%	
I have completed a degree/certification at a community college	0%	6%		5%	6%	
None of the above	86%	89%		70%	66%	
n	14	18		2437	4547	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.1.4 In what year do you expect to complete your current degree program?

	Your Institution			Similar Institutions		
	Women (%)	Men (%)	Sig.	Women (%)	Men (%)	Sig.
2019	0%	6%		3%	3%	
2020	29%	33%		23%	23%	
2021	43%	39%		27%	25%	
2022	29%	22%		27%	27%	
2023	0%	0%	N/A	20%	22%	
2024	0%	0%	N/A	1%	1%	
2025 or later	0%	0%	N/A	0%	0%	
n	14	18		2464	4575	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.1.5 Have you experienced any economic hardships during your program that made you consider, or led you to, a leave of absence?

	Your Institution			Similar Institutions		
	Women (%)	Men (%)	Sig.	Women (%)	Men (%)	Sig.
Yes	0%	6%		17%	19%	
n	14	18		2468	4584	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.1.6 Do you have any type of disability (e.g., physical, learning, mental, etc.)?

	Your Institution			Similar Institutions		
	Women (%)	Men (%)	Sig.	Women (%)	Men (%)	Sig.
Yes	7%	0%		10%	9%	
n	14	18		2459	4561	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

2.2 Entering and Exiting the Field

Table 2.2.1 Why did you choose your degree program?
Choose up to 3 responses.

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	(%)	(%)	Sig.	(%)	(%)	Sig.
I like learning about this field	77%	81%		72%	82%	
My friends are enrolled in this program	0%	31%		4%	7%	
The courses required of this program are interesting	31%	12%		33%	38%	
Professors/faculty at my institution influenced my decision	8%	6%		5%	3%	
The program will allow me to make an impact on society	46%	44%		37%	34%	
This program will enable me to make a lot of money	54%	38%		37%	39%	
The job market for this field is promising	54%	69%		66%	61%	
My family influenced my decision	8%	6%		18%	9%	
I will be successful completing the coursework required of this program	23%	0%		11%	11%	
Another reason	0%	0%	N/A	3%	4%	
None of the above	0%	0%	N/A	0%	0%	
n	13	16		2172	4278	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \le .05$ and Cohen's d or $h \ge .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.2.2 During your studies at your current institution, how often have you considered leaving your degree program before completing it?
(1) Never - (5) All the time

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
During your studies at your current institution, how often have you considered leaving your degree program before completing it?	1.79 (1.12)	1.39 (0.70)		1.91 (1.03)	1.69 (0.94)	
n	14	18		2362	4394	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \le .05$ and Cohen's d or $h \ge .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.2.3 Why did you think about leaving computing?
Choose up to 3 responses.

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	(%)	(%)	Sig.	(%)	(%)	Sig.
The courses were difficult	67%	40%		55%	43%	
The math requirements were too hard	17%	20%		10%	14%	
I was interested in trying something new	33%	40%		23%	28%	
I did not like the course material	33%	60%		21%	21%	
I was having trouble passes my courses	0%	0%	N/A	22%	20%	
I did not have any friends in the major	0%	0%	N/A	10%	8%	
The professors were not supportive	0%	0%	N/A	10%	11%	
I felt isolated in my program	17%	0%		33%	22%	
The department did not make me feel welcome	0%	20%		6%	8%	
I experienced health issues that inhibited my ability to feel/be successful	17%	0%		19%	12%	
Another reason	17%	40%		18%	24%	
None of the above	0%	0%	N/A	1%	1%	
n	6	5		1287	1962	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.2.4 What helped you continue in your program when you were contemplating leaving?
Choose up to 3 responses.

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	(%)	(%)	Sig.	(%)	(%)	Sig.
My family encouraged/supported me	17%	60%		40%	34%	
My friends encouraged/supported me	33%	40%		38%	29%	
Professors/faculty encouraged/supported me	33%	0%		13%	11%	
I had already invested too much time and resources	50%	80%		68%	63%	
I liked the field of study	50%	20%		46%	54%	
The job market is promising	83%	40%		46%	48%	
Another reason	0%	0%	N/A	5%	8%	
None of the above	0%	0%	N/A	1%	1%	
n	6	5		1280	1947	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

2.3   Perceptions of the Department

Table 2.3.1 Please indicate the extent to which you disagree or agree with the following statements.
(1) Strongly disagree - (5) Strongly agree

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Overall, I am satisfied with the computing program at my institution	3.57 (1.02)	4.00 (1.12)		3.94 (0.99)	3.98 (1.01)	
I would recommend taking computing courses at my institution to a friend	3.93 (0.92)	4.47 (0.80)		4.00 (1.02)	4.07 (0.99)	
The number of students in my computing classes is too large	3.64 (1.08)	3.76 (1.03)		3.31 (1.15)	3.23 (1.14)	
I am satisfied with the technical content of the computing courses	3.43 (0.94)	4.06 (0.90)		3.86 (0.93)	3.89 (0.96)	
The computing courses at my institution are too difficult	3.07 (1.21)	2.71 (1.16)		2.98 (1.03)	2.70 (1.04)	
n	14	17		2426	4519	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.3.2 How dissatisfied or satisfied are you with the following aspects of the computing program at your institution?
(1) Very dissatisfied - (5) Very satisfied

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
The variety of computing courses offered	2.93 (1.33)	3.00 (1.46)		3.75 (1.04)	3.81 (1.03)	
Access to academic resources needed to do your work	3.93 (1.00)	3.71 (1.10)		3.84 (1.00)	3.94 (0.96)	
The availability of professors/instructors outside of class (e.g., office hours, answering questions via email, etc.)	3.93 (1.21)	3.82 (1.01)		3.91 (1.02)	3.93 (1.01)	
How well the program has prepared you for your future career	3.14 (1.10)	3.71 (1.05)		3.61 (0.99)	3.64 (1.00)	
The workload expected of you	3.00 (1.04)	3.65 (0.86)		3.33 (1.06)	3.48 (1.02)	
n	14	17		2425	4524	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.3.3 Rate how you feel about the environment of the department of your computing program.
(1) Strongly disagree - (5) Strongly agree

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
I feel a sense of community in the computing department	3.00 (1.11)	2.82 (1.19)		3.40 (1.13)	3.42 (1.12)	
People in the department often attribute my success to special treatment or luck, rather than my competence	2.36 (1.22)	1.76 (0.90)		2.22 (1.11)	2.11 (1.12)	
The environment in the computing department inspires me to do the best job that I can	3.14 (1.03)	3.18 (1.07)		3.47 (1.03)	3.53 (1.00)	
My ideas or opinions are minimized or ignored	2.71 (0.99)	2.00 (1.06)		2.36 (1.06)	2.29 (1.07)	
The department cares about its students	4.07 (0.83)	3.82 (0.88)		3.85 (1.01)	3.86 (1.03)	
The department is NOT very supportive of its students	2.14 (0.77)	2.24 (0.97)		2.17 (1.08)	2.17 (1.12)	
Computer science administrators (e.g., the department chair, dean, staff) and faculty care about diversity	3.79 (0.97)	3.53 (0.62)		3.68 (0.96)	3.75 (0.95)	
n	14	17		2422	4516	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.3.4 Do you have access to one or more academic advisor(s)?
Select all that apply

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	(%)	(%)	Sig.	(%)	(%)	Sig.
Yes, I have an academic advisor(s) affiliated with the computing department	79%	82%		81%	83%	
Yes, I have an academic advisor(s) affiliated with another department	21%	35%		33%	28%	
No, I do not have an advisor yet	0%	0%	N/A	5%	6%	
n	14	17		2433	4520	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.3.5 About how many times per semester/quarter do you interact with academic advisor(s) for the following reasons?
(1) Never - (5) Four or more times

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Course-related guidance	1.79 (0.43)	2.06 (0.90)		2.21 (0.71)	2.23 (0.74)	
Career advice	1.14 (0.36)	1.47 (0.72)		1.58 (0.78)	1.63 (0.78)	
Graduate school advice	1.14 (0.36)	1.35 (0.70)		1.33 (0.66)	1.45 (0.73)	
Another reason	1.14 (0.36)	1.47 (0.72)		1.53 (0.79)	1.60 (0.83)	
n	14	17		2221	4082	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.3.6 How dissatisfied or satisfied are you with the following?
(1) Very dissatisfied - (5) Very satisfied

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
How often you meet with your advisor(s)	3.21 (0.97)	3.29 (1.16)		3.39 (1.17)	3.45 (1.13)	
The academic guidance your advisor(s) provides	2.79 (0.97)	3.18 (1.13)		3.44 (1.25)	3.57 (1.18)	
The career advice your advisor(s) provides	2.79 (0.97)	3.29 (1.16)		3.26 (1.16)	3.36 (1.12)	
n	14	17		2300	4227	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

2.4 Support Structures

Table 2.4.1 Approximately how often do you interact with the following individuals?
(1) Never - (5) More than 3 times per week

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Teaching assistants	3.29 (0.83)	3.24 (0.97)		3.24 (1.15)	3.05 (1.16)	
An instructor/faculty member outside of lecture regarding a course	2.57 (1.16)	2.29 (0.77)		2.41 (1.03)	2.43 (1.05)	
An instructor/faculty member outside of lecture NOT regarding a course	1.86 (1.23)	2.18 (0.88)		1.71 (1.00)	1.83 (1.04)	
Classmates outside of lecture	4.71 (0.47)	4.29 (1.16)		4.05 (1.16)	3.97 (1.21)	
n	14	17		2396	4484	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.4.2 How often to you receive the following from other students if you need it?
(1) Not at all - (5) Very much

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Help and support	3.71 (1.14)	3.69 (1.08)		3.68 (1.06)	3.54 (1.12)	
Willingness to listen to issues you are having at school	3.93 (1.07)	3.38 (1.36)		3.56 (1.17)	3.40 (1.18)	
Feedback about your work	3.21 (1.25)	3.50 (1.15)		3.35 (1.18)	3.35 (1.15)	
n	14	16		2409	4492	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.4.3 To what extent do you have a mentor who:
(1) Not at all - (5) Very much

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
helps you improve your computing skills	2.14 (1.23)	2.41 (1.46)		2.37 (1.37)	2.37 (1.38)	
shows compassion for any issues you discussed with them	2.71 (1.68)	2.82 (1.29)		2.98 (1.47)	2.73 (1.46)	
shares personal experiences as an alternative perspective to your problem	2.29 (1.54)	2.53 (1.37)		2.83 (1.48)	2.63 (1.46)	
explores career options with you	2.36 (1.55)	2.65 (1.41)		2.61 (1.42)	2.47 (1.42)	
encourages you to do the best you can in your coursework	2.79 (1.67)	2.65 (1.32)		3.01 (1.52)	2.80 (1.52)	
supports your research ideas	2.21 (1.25)	2.35 (1.46)		2.40 (1.43)	2.36 (1.41)	
n	14	17		2393	4476	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.4.4 Think about your relationships in computing. To what extent is each of the following available to you at this point?
(1) Not at all - (5) Very much

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
People with whom you can discuss professional development questions	3.50 (1.16)	3.82 (0.88)		3.40 (1.12)	3.44 (1.13)	
People with whom you can discuss graduate school opportunities	3.21 (1.05)	3.71 (0.92)		3.10 (1.20)	3.16 (1.20)	
A strong network of peers to interact with at conferences	2.93 (1.00)	2.76 (1.44)		2.83 (1.25)	2.84 (1.24)	
A strong network of mentors to interact with at conferences	2.64 (1.28)	2.35 (1.17)		2.58 (1.24)	2.68 (1.25)	
People who would be excited to learn about your professional successes	3.50 (0.85)	3.47 (1.23)		3.28 (1.19)	3.21 (1.20)	
People with whom you can discuss issues you are having	3.07 (1.33)	3.65 (0.70)		3.37 (1.16)	3.38 (1.16)	
n	14	17		2448	4541	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

2.5 Self-perceptions

Table 2.5.1 Please indicate the extent to which you disagree or agree with the following statements.
(1) Strongly Disagree - (5) Strongly Agree

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
I see myself as a computing person	3.50 (0.94)	4.24 (0.66)	*	3.70 (1.00)	4.09 (0.92)	*
I feel like I belong in computing	3.14 (1.03)	3.88 (0.99)		3.41 (1.09)	3.94 (0.99)	*
I feel like an outsider in computing	3.50 (1.09)	1.76 (1.03)	*	2.93 (1.14)	2.23 (1.13)	*
Computing is a big part of who I am	3.21 (1.05)	2.88 (1.17)		3.11 (1.16)	3.51 (1.12)	*
I feel welcomed in computing	2.93 (0.73)	3.88 (0.78)	*	3.37 (0.99)	3.81 (0.94)	*
I do not have much in common with the other students in my computing classes	2.93 (0.92)	2.65 (1.27)		2.90 (1.10)	2.67 (1.13)	
n	14	17		2455	4558	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.5.2 In your opinion, to what extent are each of the following statements true of you?
(1) Not at all - (5) Very much

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
I can give the impression that I'm more competent than I really am	3.43 (1.55)	3.82 (1.13)		3.29 (1.22)	3.30 (1.21)	
When others praise me for something I have accomplished, I'm afraid I won't be able to live up to their expectations of me in the future	3.64 (1.55)	2.88 (1.32)		3.63 (1.23)	3.13 (1.28)	*
At times, I feel my success has been due to some kind of luck	3.93 (1.21)	3.12 (1.22)		3.42 (1.30)	2.97 (1.32)	*
I'm disappointed at times in my present accomplishments and think I should have accomplished much more by now	4.07 (1.38)	3.06 (1.09)	*	3.62 (1.29)	3.39 (1.31)	
n	14	17		2438	4538	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.5.3 I am confident that I can:
(1) Strongly disagree - (5) Strongly agree

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
pass my computing courses	4.43 (0.76)	4.76 (0.44)		4.25 (0.87)	4.51 (0.76)	*
learn the foundations and concepts of computing	4.50 (0.85)	4.65 (0.49)		4.37 (0.74)	4.57 (0.67)	
do well in a computing-related contest (e.g., programming contest, robotics contest, hackathon)	2.36 (0.93)	3.53 (1.28)	*	3.13 (1.14)	3.64 (1.13)	*
quickly learn a new programming language on my own	3.64 (1.39)	4.24 (0.66)		3.74 (1.07)	4.05 (0.98)	*
contribute to a research project in computing	3.21 (1.19)	3.82 (0.88)		3.45 (1.10)	3.76 (1.04)	
clearly communicate technical problems and solutions to a range of audiences	3.92 (1.26)	4.06 (0.75)		3.77 (1.01)	4.05 (0.91)	
articulate thoughtful answers to theoretical questions about your work during a presentation	3.69 (1.38)	4.24 (0.75)		3.81 (0.98)	4.06 (0.90)	
introduce myself to new peers/colleagues at professional meetings	3.85 (1.41)	4.00 (0.87)		3.94 (1.03)	4.00 (1.02)	
be a capable researcher in computing	3.15 (1.14)	3.41 (1.00)		3.29 (1.10)	3.61 (1.06)	
find employment in an area of computing interest	3.92 (1.04)	4.06 (1.03)		3.96 (0.98)	4.15 (0.90)	
complete an undergraduate degree in computing	4.86 (0.53)	4.82 (0.39)		4.44 (0.89)	4.63 (0.72)	
get admitted to a graduate computing program	3.50 (1.16)	3.82 (1.01)		3.56 (1.12)	3.87 (1.02)	
be successful in a graduate computing program	3.29 (0.99)	3.88 (1.11)		3.52 (1.10)	3.88 (1.02)	*
n	14	17		2445	4538	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.5.4 In your opinion, to what extent would a career in computing allow you to do the following.
(1) Not at all - (5) Extremely

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Serve humanity	3.86 (0.66)	3.56 (0.78)		3.63 (1.00)	3.57 (1.06)	
Be in a position of influence in society	3.93 (0.83)	3.61 (1.04)		3.52 (1.06)	3.43 (1.14)	
Spend at lot of time with family	3.64 (0.63)	3.28 (1.02)		3.23 (0.98)	3.29 (1.00)	
n	14	18		2461	4576	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

2.6 Activities

Table 2.6.1 How often have you been involved in each of the following groups or activities?
(1) Never - (5) Four or more times

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Internships related to computing	2.00 (0.91)	1.88 (0.96)		1.73 (0.89)	1.70 (0.91)	
Jobs related to computing	1.31 (0.85)	1.25 (0.77)		1.42 (0.77)	1.47 (0.83)	
Career mentoring programs or workshops	2.15 (1.07)	1.56 (0.89)		1.66 (0.94)	1.50 (0.85)	
Outreach to K-12 students related to computing	1.62 (1.04)	1.19 (0.54)		1.62 (1.01)	1.44 (0.87)	
Computing-related student groups (e.g., technical organizations on campus, ACM student chapters, etc.)	2.31 (1.03)	1.94 (1.06)		2.07 (1.07)	1.89 (1.02)	
Other student groups (e.g., Greek Life, volunteer groups, academic merit societies, etc.)	2.54 (1.13)	2.38 (1.20)		2.25 (1.19)	1.91 (1.08)	*
n	13	16		2384	4472	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.6.2 How often have you been involved in each of the following groups or activities?
(1) Never - (5) Four or more times

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Submitted a poster proposal to a conference	1.23 (0.44)	1.29 (0.77)		1.17 (0.52)	1.19 (0.55)	
Submitted a paper proposal to a conference	1.15 (0.38)	1.24 (0.44)		1.12 (0.44)	1.16 (0.51)	
Submitted a paper for publication in a peer reviewed journal	1.08 (0.28)	1.18 (0.53)		1.10 (0.42)	1.13 (0.49)	
Presented a poster at a conference	1.15 (0.38)	1.29 (0.77)		1.15 (0.49)	1.19 (0.55)	
Given an oral presentation at a conference	1.15 (0.38)	1.12 (0.49)		1.15 (0.48)	1.19 (0.57)	
Had a paper accepted for publication in conference proceedings	1.15 (0.38)	1.00 (0.00)		1.10 (0.42)	1.12 (0.46)	
Had a paper accepted for publication in a peer reviewed journal	1.00 (0.00)	1.12 (0.49)		1.09 (0.39)	1.12 (0.46)	
n	13	17		2385	4470	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.6.3 During your academic career to date, have you participated in any of the following conferences or programs?
Select all that apply

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	(%)	(%)	Sig.	(%)	(%)	Sig.
ACM Richard Tapia Celebration of Diversity in Computing	0%	6%		2%	2%	
Grace Hopper Celebration of Women in Computing	46%	0%	*	11%	0%	*
Local events related to diversity in computing	15%	6%		14%	5%	*
None of these	46%	88%	*	75%	93%	*
n	13	16		2142	3967	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.6.4 During your academic career to date, have you pursued any of the following resources at your institution?
Select all that apply

	Your Institution			Similar Institutions		
	Women (%)	Men (%)	Sig.	Women (%)	Men (%)	Sig.
Peer tutoring	31%	18%		38%	27%	
Tutoring offered by your department/college	31%	12%		32%	24%	
Peer mentoring	8%	12%		22%	15%	
Career counseling	31%	18%		25%	18%	
Mental health counseling	31%	24%		25%	12%	*
Does not apply to me	31%	53%		31%	47%	*
n	13	17		2355	4301	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

2.7   Future Plans and Interests

Table 2.7.1 For your future career, in which setting would you like to work the most?

	Your Institution			Similar Institutions		
	Women (%)	Men (%)	Sig.	Women (%)	Men (%)	Sig.
Academia	7%	0%		10%	9%	
Industry	79%	88%		67%	63%	
Government	0%	6%		10%	8%	
Self-employment	7%	6%		8%	16%	
Something else	7%	0%		5%	3%	
n	14	17		2461	4580	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.7.2 How interested are you in having a career:
(1) Not at all interested - (5) Extremely interested

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
doing computing-related work	4.07 (0.83)	4.00 (0.94)		4.04 (1.04)	4.28 (0.89)	
in computing research	2.79 (1.19)	2.65 (1.32)		2.68 (1.24)	2.97 (1.20)	
n	14	17		2460	4578	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.7.3 How interested are you in having the types of jobs listed below after you finish your highest degree?
(1) Very uninterested - (5) Very interested

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
College or university professor in computing field (teaching focused)	3.07 (1.69)	2.06 (1.30)		2.51 (1.37)	2.58 (1.31)	
College or university professor in computing field (research focused)	2.57 (1.70)	2.18 (1.38)		2.32 (1.30)	2.58 (1.31)	
K-12 computing teacher	2.71 (1.54)	2.00 (1.32)		2.11 (1.25)	2.04 (1.19)	
Computing researcher in industry	2.64 (1.78)	2.94 (1.43)		2.91 (1.31)	3.22 (1.24)	
Computing researcher in a government lab or agency	2.86 (1.46)	2.76 (1.48)		2.79 (1.32)	3.07 (1.27)	
A non-research computing position in industry (e.g., software engineer)	4.14 (1.17)	4.06 (1.14)		4.09 (1.12)	4.18 (1.00)	
A non-research computing position in government	2.79 (1.31)	3.24 (1.30)		3.24 (1.31)	3.40 (1.22)	
Entrepreneur (computing related; e.g., individual contractor, build a start-up)	3.69 (1.49)	4.00 (0.87)		3.22 (1.31)	3.60 (1.23)	*
Non-computing career	2.71 (1.33)	2.65 (1.27)		2.71 (1.29)	2.35 (1.23)	
n	14	17		2451	4549	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.7.4 What is the highest degree you plan to attain?

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	(%)	(%)	Sig.	(%)	(%)	Sig.
Associate's degree	0%	0%	N/A	0%	0%	
Bachelor's degree	14%	39%		37%	40%	
Master's degree	50%	44%		47%	44%	
Doctoral degree	36%	17%		16%	15%	
None of the above	0%	0%	N/A	0%	0%	N/A
n	14	18		2461	4583	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 2.7.5 Do you intend to earn/ have your earned your highest degree in a computing-related field?

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	(%)	(%)	Sig.	(%)	(%)	Sig.
No	31%	22%		20%	14%	
Yes	69%	78%		80%	86%	
n	13	18		2443	4533	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Chapter 3

Undergraduate Students: Results by Race/Ethnicity

3.1 Student Background

Table 3.1.1 Which of the following experiences did you have prior to entering college?
Select all that apply

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	(%)	(%)	Sig.	(%)	(%)	Sig.
Took AP Computer Science A	53%	N/A	N/A	38%	22%	*
Took AP Computer Science Principles	10%	N/A	N/A	11%	12%	
Took other AP courses	53%	N/A	N/A	54%	45%	
Took dual enrollment courses	3%	N/A	N/A	18%	22%	
Learned a computer programming language	50%	N/A	N/A	55%	45%	
Engaged in software or hardware related projects	27%	N/A	N/A	37%	30%	
Took part in student groups related to computing	13%	N/A	N/A	25%	21%	
Completed an online course related to computing (e.g., MOOC)	0%	N/A	N/A	12%	9%	
Attended a workshop or other training in computing (e.g., through your local library, community center, etc.)	10%	N/A	N/A	12%	13%	
None of the above	7%	N/A	N/A	16%	20%	
n	30	3		5768	1235	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.1.2 Which of the following mathematics courses did you take prior to entering college?
Select all that apply

	Your Institution			Similar Institutions		
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
Algebra I	93%	N/A	N/A	94%	92%	
Algebra II	97%	N/A	N/A	92%	88%	
Trigonometry	77%	N/A	N/A	79%	67%	
Pre-calculus	93%	N/A	N/A	90%	81%	
Calculus	100%	N/A	N/A	82%	60%	*
Statistics	57%	N/A	N/A	41%	25%	*
None of the above	0%	N/A	N/A	1%	2%	
n	30	3		5774	1237	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.
(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.1.3 Which of the following applies to you?
Select all that apply

	Your Institution			Similar Institutions		
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
I temporarily withdrew from my current institution	3%	N/A	N/A	2%	3%	
I transferred from a 2-year institution to my current institution	0%	N/A	N/A	8%	19%	*
I transferred from a 4-year institution to my current institution	0%	N/A	N/A	6%	6%	
I have taken courses for credit at a community college	7%	N/A	N/A	20%	29%	
I have completed a degree/certification at a community college	3%	N/A	N/A	4%	11%	
None of the above	90%	N/A	N/A	70%	56%	
n	30	3		5704	1216	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.
(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.1.4 In what year do you expect to complete your current degree program?

	Your Institution			Similar Institutions		
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
2019	3%	N/A	N/A	3%	2%	
2020	33%	N/A	N/A	23%	20%	
2021	43%	N/A	N/A	26%	26%	
2022	20%	N/A	N/A	26%	28%	
2023	0%	N/A	N/A	21%	23%	
2024	0%	N/A	N/A	1%	2%	
2025 or later	0%	N/A	N/A	0%	0%	
n	30	3		5744	1229	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.1.5 Have you experienced any economic hardships during your program that made you consider, or led you to, a leave of absence?

	Your Institution			Similar Institutions		
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
Yes	3%	N/A	N/A	15%	34%	*
n	30	3		5754	1235	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.1.6 Do you have any type of disability (e.g., physical, learning, mental, etc.)?

	Your Institution			Similar Institutions		
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
Yes	3%	N/A	N/A	10%	10%	
n	30	3		5733	1235	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

3.2 Entering and Exiting the Field

Table 3.2.1 Why did you choose your degree program?
Choose up to 3 responses.

	Your Institution			Similar Institutions		
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
I like learning about this field	75%	N/A	N/A	79%	79%	
My friends are enrolled in this program	18%	N/A	N/A	6%	5%	
The courses required of this program are interesting	21%	N/A	N/A	37%	34%	
Professors/faculty at my institution influenced my decision	7%	N/A	N/A	3%	4%	
The program will allow me to make an impact on society	43%	N/A	N/A	34%	39%	
This program will enable me to make a lot of money	46%	N/A	N/A	38%	42%	
The job market for this field is promising	61%	N/A	N/A	63%	60%	
My family influenced my decision	4%	N/A	N/A	13%	8%	
I will be successful completing the coursework required of this program	14%	N/A	N/A	11%	9%	
Another reason	0%	N/A	N/A	3%	4%	
None of the above	0%	N/A	N/A	0%	0%	
n	28	2		5298	1092	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.2.2 During your studies at your current institution, how often have you considered leaving your degree program before completing it?
(1) Never - (5) All the time

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
During your studies at your current institution, how often have you considered leaving your degree program before completing it?	1.70 (1.12)	N/A	N/A	1.74 (0.97)	1.90 (1.02)	
n	30	3		5531	1174	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.2.3 Why did you think about leaving computing?
Choose up to 3 responses.

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	(%)	(%)	Sig.	(%)	(%)	Sig.
The courses were difficult	36%	N/A	N/A	47%	49%	
The math requirements were too hard	9%	N/A	N/A	11%	18%	
I was interested in trying something new	27%	N/A	N/A	27%	22%	
I did not like the course material	45%	N/A	N/A	23%	15%	
I was having trouble passes my courses	9%	N/A	N/A	19%	30%	
I did not have any friends in the major	9%	N/A	N/A	8%	11%	
The professors were not supportive	0%	N/A	N/A	11%	10%	
I felt isolated in my program	18%	N/A	N/A	25%	30%	
The department did not make me feel welcome	9%	N/A	N/A	7%	7%	
I experienced health issues that inhibited my ability to feel/be successful	0%	N/A	N/A	15%	14%	
Another reason	36%	N/A	N/A	21%	22%	
None of the above	0%	N/A	N/A	1%	1%	
n	11	1		2575	652	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.2.4 What helped you continue in your program when you were contemplating leaving?
Choose up to 3 responses.

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	(%)	(%)	Sig.	(%)	(%)	Sig.
My family encouraged/supported me	18%	N/A	N/A	36%	38%	
My friends encouraged/supported me	18%	N/A	N/A	32%	36%	
Professors/faculty encouraged/supported me	27%	N/A	N/A	11%	13%	
I had already invested too much time and resources	64%	N/A	N/A	66%	63%	
I liked the field of study	36%	N/A	N/A	51%	53%	
The job market is promising	64%	N/A	N/A	48%	45%	
Another reason	9%	N/A	N/A	7%	8%	
None of the above	0%	N/A	N/A	1%	1%	
n	11	1		2557	648	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

3.3 Perceptions of the Department

Table 3.3.1 Please indicate the extent to which you disagree or agree with the following statements.
(1) Strongly disagree - (5) Strongly agree

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Overall, I am satisfied with the computing program at my institution	3.72 (1.10)	N/A	N/A	3.97 (1.00)	3.92 (1.05)	
I would recommend taking computing courses at my institution to a friend	4.07 (0.88)	N/A	N/A	4.05 (0.99)	4.01 (1.02)	
The number of students in my computing classes is too large	3.66 (1.08)	N/A	N/A	3.29 (1.15)	3.13 (1.13)	
I am satisfied with the technical content of the computing courses	3.62 (1.01)	N/A	N/A	3.89 (0.95)	3.85 (0.96)	
The computing courses at my institution are too difficult	2.86 (1.22)	N/A	N/A	2.76 (1.04)	2.94 (1.04)	
n	29	3		5664	1220	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.3.2 How dissatisfied or satisfied are you with the following aspects of the computing program at your institution?

(1) Very dissatisfied - (5) Very satisfied

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
The variety of computing courses offered	2.83 (1.31)	N/A	N/A	3.79 (1.03)	3.75 (1.07)	
Access to academic resources needed to do your work	3.69 (1.07)	N/A	N/A	3.91 (0.96)	3.86 (1.02)	
The availability of professors/instructors outside of class (e.g., office hours, answering questions via email, etc.)	3.79 (1.15)	N/A	N/A	3.93 (1.01)	3.86 (1.05)	
How well the program has prepared you for your future career	3.31 (1.20)	N/A	N/A	3.62 (1.00)	3.60 (0.99)	
The workload expected of you	3.28 (1.00)	N/A	N/A	3.42 (1.04)	3.42 (1.04)	
n	29	3		5666	1222	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.3.3 Rate how you feel about the environment of the department of your computing program.
(1) Strongly disagree - (5) Strongly agree

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
I feel a sense of community in the computing department	2.83 (1.17)	N/A	N/A	3.41 (1.13)	3.40 (1.13)	
People in the department often attribute my success to special treatment or luck, rather than my competence	2.03 (1.05)	N/A	N/A	2.12 (1.10)	2.24 (1.14)	
The environment in the computing department inspires me to do the best job that I can	3.03 (1.09)	N/A	N/A	3.50 (1.01)	3.51 (1.03)	
My ideas or opinions are minimized or ignored	2.38 (1.05)	N/A	N/A	2.30 (1.06)	2.42 (1.12)	
The department cares about its students	3.86 (0.88)	N/A	N/A	3.85 (1.02)	3.87 (1.02)	
The department is NOT very supportive of its students	2.17 (0.85)	N/A	N/A	2.16 (1.09)	2.20 (1.12)	
Computer science administrators (e.g., the department chair, dean, staff) and faculty care about diversity	3.62 (0.82)	N/A	N/A	3.74 (0.94)	3.64 (1.01)	
n	29	3		5664	1215	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.3.4 Do you have access to one or more academic advisor(s)?
Select all that apply

	Your Institution			Similar Institutions		
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
Yes, I have an academic advisor(s) affiliated with the computing department	83%	N/A	N/A	83%	77%	
Yes, I have an academic advisor(s) affiliated with another department	28%	N/A	N/A	30%	32%	
No, I do not have an advisor yet	0%	N/A	N/A	5%	5%	
n	29	3		5674	1220	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.3.5 About how many times per semester/quarter do you interact with academic advisor(s) for the following reasons?
(1) Never - (5) Four or more times

	Your Institution			Similar Institutions		
	AW Mean (SD)	BHN Mean (SD)	Sig.	AW Mean (SD)	BHN Mean (SD)	Sig.
Course-related guidance	1.83 (0.60)	N/A	N/A	2.20 (0.72)	2.30 (0.77)	
Career advice	1.34 (0.61)	N/A	N/A	1.58 (0.77)	1.72 (0.83)	
Graduate school advice	1.31 (0.60)	N/A	N/A	1.39 (0.69)	1.47 (0.76)	
Another reason	1.28 (0.53)	N/A	N/A	1.54 (0.80)	1.72 (0.88)	
n	29	3		5147	1104	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.3.6 How dissatisfied or satisfied are you with the following?
(1) Very dissatisfied - (5) Very satisfied

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
How often you meet with your advisor(s)	3.21 (0.94)	N/A	N/A	3.41 (1.14)	3.49 (1.16)	
The academic guidance your advisor(s) provides	2.97 (0.94)	N/A	N/A	3.50 (1.20)	3.65 (1.19)	
The career advice your advisor(s) provides	3.03 (0.98)	N/A	N/A	3.29 (1.13)	3.47 (1.16)	
n	29	3		5328	1148	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.
(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

3.4   Support Structures

Table 3.4.1 Approximately how often do you interact with the following individuals?
(1) Never - (5) More than 3 times per week

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Teaching assistants	3.14 (0.99)	N/A	N/A	3.12 (1.15)	3.07 (1.19)	
An instructor/faculty member outside of lecture regarding a course	2.31 (0.97)	N/A	N/A	2.40 (1.02)	2.51 (1.10)	
An instructor/faculty member outside of lecture NOT regarding a course	1.93 (1.03)	N/A	N/A	1.77 (1.01)	1.83 (1.08)	
Classmates outside of lecture	4.31 (1.17)	N/A	N/A	4.05 (1.16)	3.74 (1.29)	
n	29	3		5607	1215	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.
(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.4.2 How often to you receive the following from other students if you need it?
(1) Not at all - (5) Very much

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Help and support	3.52 (1.18)	N/A	N/A	3.60 (1.09)	3.50 (1.17)	
Willingness to listen to issues you are having at school	3.45 (1.33)	N/A	N/A	3.47 (1.16)	3.36 (1.23)	
Feedback about your work	3.17 (1.23)	N/A	N/A	3.35 (1.15)	3.31 (1.22)	
n	29	2		5629	1213	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.4.3 To what extent do you have a mentor who:
(1) Not at all - (5) Very much

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
helps you improve your computing skills	2.28 (1.39)	N/A	N/A	2.37 (1.37)	2.31 (1.40)	
shows compassion for any issues you discussed with them	2.66 (1.47)	N/A	N/A	2.82 (1.46)	2.76 (1.51)	
shares personal experiences as an alternative perspective to your problem	2.31 (1.39)	N/A	N/A	2.69 (1.46)	2.72 (1.51)	
explores career options with you	2.41 (1.50)	N/A	N/A	2.51 (1.41)	2.50 (1.47)	
encourages you to do the best you can in your coursework	2.62 (1.45)	N/A	N/A	2.86 (1.51)	2.90 (1.59)	
supports your research ideas	2.24 (1.38)	N/A	N/A	2.36 (1.41)	2.41 (1.47)	
n	29	3		5599	1209	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.4.4 Think about your relationships in computing. To what extent is each of the following available to you at this point?

(1) Not at all - (5) Very much

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
People with whom you can discuss professional development questions	3.52 (1.06)	N/A	N/A	3.42 (1.12)	3.38 (1.19)	
People with whom you can discuss graduate school opportunities	3.31 (1.11)	N/A	N/A	3.13 (1.19)	3.13 (1.24)	
A strong network of peers to interact with at conferences	2.66 (1.20)	N/A	N/A	2.83 (1.23)	2.82 (1.29)	
A strong network of mentors to interact with at conferences	2.38 (1.21)	N/A	N/A	2.62 (1.24)	2.70 (1.30)	
People who would be excited to learn about your professional successes	3.31 (1.14)	N/A	N/A	3.24 (1.19)	3.19 (1.24)	
People with whom you can discuss issues you are having	3.21 (1.11)	N/A	N/A	3.39 (1.15)	3.28 (1.21)	
n	29	3		5699	1226	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

3.5   Self-perceptions

Table 3.5.1 Please indicate the extent to which you disagree or agree with the following statements.
(1) Strongly Disagree - (5) Strongly Agree

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
I see myself as a computing person	3.79 (1.01)	N/A	N/A	3.95 (0.97)	3.93 (0.96)	
I feel like I belong in computing	3.45 (1.09)	N/A	N/A	3.76 (1.06)	3.69 (1.08)	
I feel like an outsider in computing	2.66 (1.37)	N/A	N/A	2.43 (1.17)	2.73 (1.24)	
Computing is a big part of who I am	2.97 (1.15)	N/A	N/A	3.37 (1.15)	3.34 (1.18)	
I feel welcomed in computing	3.31 (0.97)	N/A	N/A	3.67 (0.97)	3.52 (1.04)	
I do not have much in common with the other students in my computing classes	2.93 (1.22)	N/A	N/A	2.70 (1.11)	2.98 (1.15)	
n	29	3		5718	1231	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.5.2 In your opinion, to what extent are each of the following statements true of you?
(1) Not at all - (5) Very much

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
I can give the impression that I'm more competent than I really am	3.62 (1.40)	N/A	N/A	3.28 (1.21)	3.34 (1.24)	
When others praise me for something I have accomplished, I'm afraid I won't be able to live up to their expectations of me in the future	3.31 (1.47)	N/A	N/A	3.31 (1.28)	3.32 (1.33)	
At times, I feel my success has been due to some kind of luck	3.72 (1.16)	N/A	N/A	3.14 (1.32)	3.10 (1.37)	
I'm disappointed at times in my present accomplishments and think I should have accomplished much more by now	3.59 (1.27)	N/A	N/A	3.46 (1.30)	3.52 (1.36)	
n	29	3		5691	1224	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.5.3 I am confident that I can:
(1) Strongly disagree - (5) Strongly agree

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
pass my computing courses	4.55 (0.69)	N/A	N/A	4.44 (0.80)	4.30 (0.87)	
learn the foundations and concepts of computing	4.45 (0.87)	N/A	N/A	4.51 (0.69)	4.43 (0.76)	
do well in a computing-related contest (e.g., programming contest, robotics contest, hackathon)	2.83 (1.26)	N/A	N/A	3.45 (1.15)	3.43 (1.17)	
quickly learn a new programming language on my own	3.83 (1.10)	N/A	N/A	3.96 (1.02)	3.84 (1.07)	
contribute to a research project in computing	3.38 (1.18)	N/A	N/A	3.64 (1.07)	3.66 (1.11)	
clearly communicate technical problems and solutions to a range of audiences	3.82 (1.12)	N/A	N/A	3.96 (0.95)	3.87 (1.00)	
articulate thoughtful answers to theoretical questions about your work during a presentation	3.82 (1.25)	N/A	N/A	3.97 (0.93)	3.93 (0.97)	
introduce myself to new peers/colleagues at professional meetings	3.75 (1.24)	N/A	N/A	3.96 (1.03)	3.97 (1.04)	
be a capable researcher in computing	3.18 (1.12)	N/A	N/A	3.48 (1.08)	3.55 (1.11)	
find employment in an area of computing interest	3.82 (1.16)	N/A	N/A	4.08 (0.93)	4.04 (0.98)	
complete an undergraduate degree in computing	4.79 (0.56)	N/A	N/A	4.59 (0.77)	4.45 (0.91)	
get admitted to a graduate computing program	3.59 (1.18)	N/A	N/A	3.75 (1.06)	3.71 (1.14)	
be successful in a graduate computing program	3.52 (1.15)	N/A	N/A	3.74 (1.06)	3.75 (1.12)	
n	29	3		5694	1224	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.5.4 In your opinion, to what extent would a career in computing allow you to do the following.
(1) Not at all - (5) Extremely

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Serve humanity	3.60 (0.86)	N/A	N/A	3.55 (1.03)	3.75 (1.05)	
Be in a position of influence in society	3.70 (1.06)	N/A	N/A	3.41 (1.11)	3.68 (1.10)	
Spend at lot of time with family	3.43 (0.86)	N/A	N/A	3.23 (0.98)	3.38 (1.03)	
n	30	3		5741	1232	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.
(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

3.6   Activities

Table 3.6.1 How often have you been involved in each of the following groups or activities?
(1) Never - (5) Four or more times

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Internships related to computing	1.93 (0.94)	N/A	N/A	1.74 (0.90)	1.55 (0.86)	
Jobs related to computing	1.21 (0.63)	N/A	N/A	1.45 (0.80)	1.44 (0.81)	
Career mentoring programs or workshops	1.93 (1.02)	N/A	N/A	1.54 (0.87)	1.59 (0.93)	
Outreach to K-12 students related to computing	1.39 (0.83)	N/A	N/A	1.50 (0.92)	1.52 (0.93)	
Computing-related student groups (e.g., technical organizations on campus, ACM student chapters, etc.)	2.04 (1.07)	N/A	N/A	1.96 (1.04)	1.91 (1.04)	
Other student groups (e.g., Greek Life, volunteer groups, academic merit societies, etc.)	2.39 (1.07)	N/A	N/A	2.06 (1.13)	1.90 (1.12)	
n	28	2		5592	1209	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.
(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.6.2 How often have you been involved in each of the following groups or activities?
(1) Never - (5) Four or more times

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Submitted a poster proposal to a conference	1.36 (0.73)	N/A	N/A	1.17 (0.53)	1.19 (0.56)	
Submitted a paper proposal to a conference	1.29 (0.66)	N/A	N/A	1.14 (0.47)	1.16 (0.52)	
Submitted a paper for publication in a peer reviewed journal	1.18 (0.48)	N/A	N/A	1.11 (0.45)	1.13 (0.48)	
Presented a poster at a conference	1.32 (0.72)	N/A	N/A	1.17 (0.51)	1.19 (0.56)	
Given an oral presentation at a conference	1.21 (0.57)	N/A	N/A	1.16 (0.51)	1.24 (0.63)	
Had a paper accepted for publication in conference proceedings	1.14 (0.45)	N/A	N/A	1.11 (0.43)	1.12 (0.47)	
Had a paper accepted for publication in a peer reviewed journal	1.11 (0.42)	N/A	N/A	1.10 (0.42)	1.12 (0.46)	
n	28	3		5593	1207	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.
(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.6.3 During your academic career to date, have you participated in any of the following conferences or programs?
Select all that apply

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	(%)	(%)	Sig.	(%)	(%)	Sig.
ACM Richard Tapia Celebration of Diversity in Computing	4%	N/A	N/A	1%	5%	
Grace Hopper Celebration of Women in Computing	23%	N/A	N/A	4%	4%	
Local events related to diversity in computing	12%	N/A	N/A	8%	10%	
None of these	65%	N/A	N/A	87%	84%	
n	26	3		4970	1100	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.
(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.6.4 During your academic career to date, have you pursued any of the following resources at your institution?
Select all that apply

	Your Institution			Similar Institutions		
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
Peer tutoring	21%	N/A	N/A	30%	38%	
Tutoring offered by your department/college	18%	N/A	N/A	25%	35%	
Peer mentoring	7%	N/A	N/A	17%	22%	
Career counseling	25%	N/A	N/A	21%	21%	
Mental health counseling	32%	N/A	N/A	17%	19%	
Does not apply to me	39%	N/A	N/A	43%	35%	
n	28	3		5430	1175	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

3.7 Future Plans and Interests

Table 3.7.1 For your future career, in which setting would you like to work the most?

	Your Institution			Similar Institutions		
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
Academia	3%	N/A	N/A	10%	9%	
Industry	79%	N/A	N/A	66%	54%	
Government	7%	N/A	N/A	8%	13%	
Self-employment	7%	N/A	N/A	12%	20%	
Something else	3%	N/A	N/A	4%	4%	
n	29	3		5743	1235	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.7.2 How interested are you in having a career:
(1) Not at all interested - (5) Extremely interested

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
doing computing-related work	3.93 (0.88)	N/A	N/A	4.20 (0.95)	4.13 (0.99)	
in computing research	2.83 (1.31)	N/A	N/A	2.84 (1.22)	2.97 (1.24)	
n	29	3		5738	1236	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.7.3 How interested are you in having the types of jobs listed below after you finish your highest degree?
(1) Very uninterested - (5) Very interested

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
College or university professor in computing field (teaching focused)	2.57 (1.60)	N/A	N/A	2.56 (1.34)	2.53 (1.33)	
College or university professor in computing field (research focused)	2.39 (1.57)	N/A	N/A	2.49 (1.31)	2.49 (1.33)	
K-12 computing teacher	2.39 (1.47)	N/A	N/A	2.05 (1.20)	2.14 (1.26)	
Computing researcher in industry	2.75 (1.67)	N/A	N/A	3.10 (1.28)	3.14 (1.28)	
Computing researcher in a government lab or agency	2.82 (1.49)	N/A	N/A	2.94 (1.29)	3.09 (1.32)	
A non-research computing position in industry (e.g., software engineer)	4.04 (1.17)	N/A	N/A	4.16 (1.04)	4.05 (1.08)	
A non-research computing position in government	3.00 (1.39)	N/A	N/A	3.33 (1.25)	3.38 (1.26)	
Entrepreneur (computing related; e.g., individual contractor, build a start-up)	3.74 (1.26)	N/A	N/A	3.41 (1.28)	3.65 (1.26)	
Non-computing career	2.54 (1.26)	N/A	N/A	2.48 (1.27)	2.52 (1.27)	
n	28	3		5714	1220	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.7.4 What is the highest degree you plan to attain?

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	(%)	(%)	Sig.	(%)	(%)	Sig.
Associate's degree	0%	N/A	N/A	0%	1%	
Bachelor's degree	27%	N/A	N/A	39%	41%	
Master's degree	47%	N/A	N/A	46%	42%	
Doctoral degree	27%	N/A	N/A	15%	17%	
None of the above	0%	N/A	N/A	0%	0%	N/A
n	30	3		5744	1235	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 3.7.5 Do you intend to earn/ have your earned your highest degree in a computing-related field?

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	(%)	(%)	Sig.	(%)	(%)	Sig.
No	28%	N/A	N/A	16%	18%	
Yes	72%	N/A	N/A	84%	82%	
n	29	3		5693	1219	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Part II

Graduate Students

Chapter 4

Graduate Students: General Results

4.1 Student Background

Table 4.1.1 Which of the following experiences did you have prior to entering college?
Select all that apply

	Your Institution (%)	Similar Institutions (%)	Sig.
Took AP Computer Science A	29%	20%	
Took AP Computer Science Principles	2%	8%	
Took other AP courses	41%	26%	*
Took dual enrollment courses	10%	7%	
Learned a computer programming language	71%	58%	
Engaged in software or hardware related projects	41%	45%	
Took part in student groups related to computing	37%	23%	
Completed an online course related to computing (e.g., MOOC)	10%	20%	
Attended a workshop or other training in computing (e.g., through your local library, community center, etc.)	10%	18%	
None of the above	17%	19%	
n	41	3324	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.1.2 Which of the following mathematics courses did you take prior to entering college?
Select all that apply

	Your Institution (%)	Similar Institutions (%)	Sig.
Algebra I	83%	88%	
Algebra II	73%	80%	
Trigonometry	78%	78%	
Pre-calculus	83%	77%	
Calculus	76%	76%	
Statistics	37%	55%	*
None of the above	5%	4%	
n	41	3321	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.1.3 Which of the following applies to you?
Select all that apply

	Your Institution (%)	Similar Institutions (%)	Sig.
I temporarily withdrew from my current institution	0%	1%	
I have taken courses for credit at a community college	10%	11%	
I have completed a degree/certification at a community college	0%	4%	
None of the above	90%	85%	
n	40	2982	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.1.4 Is your current degree program in a computing field?

	Your Institution (%)	Similar Institutions (%)	Sig.
Yes	97%	98%	
n	37	2969	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.1.5 In what year do you expect to complete your current degree program?

	Your Institution (%)	Similar Institutions (%)	Sig.
2019	0%	5%	
2020	25%	35%	
2021	30%	32%	
2022	22%	11%	*
2023	18%	10%	
2024	5%	8%	
2025 or later	0%	0%	
n	40	2970	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.1.6 Have you experienced any economic hardships during your program that made you consider, or led you to, a leave of absence?

	Your Institution (%)	Similar Institutions (%)	Sig.
Yes	0%	17%	*
n	40	3006	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.1.7 Do you have any type of disability (e.g., physical, learning, mental, etc.)?

	Your Institution (%)	Similar Institutions (%)	Sig.
Yes	6%	6%	
n	34	2561	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

4.2 Entering and Exiting the Field

Table 4.2.1 Why did you choose your degree program?
Choose up to 3 responses.

	Your Institution (%)	Similar Institutions (%)	Sig.
I like learning about this field	68%	74%	
My friends are enrolled in this program	3%	1%	
The courses required of this program are interesting	6%	23%	*
Professors/faculty at my institution influenced my decision	32%	22%	
The program will allow me to make an impact on society	15%	29%	
The job market for this field is promising	18%	39%	*
I want to pursue research in this field	76%	39%	*
This program will enable me to make a lot of money	0%	10%	
My family influenced my decision	3%	3%	
I will be successful completing the coursework required of this program	6%	6%	
I aspire to make a difference in this field	29%	21%	
Another reason	0%	4%	
None of the above	3%	0%	
n	34	2868	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.2.2 During your studies at your current institution, how often have you considered leaving your degree program before completing it?
(1) Never - (5) All the time

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
During your studies at your current institution, how often have you considered leaving your degree program before completing it?	1.65 (0.86)	1.68 (0.98)	
n	37	2955	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.2.3 Why did you think about leaving computing?
Choose up to 3 responses.

	Your Institution (%)	Similar Institutions (%)	Sig.
The courses were difficult	19%	16%	
The math requirements were too hard	6%	5%	
I was interested in trying something new	6%	13%	
I did not like the course material	0%	11%	
I was having trouble passes my courses	0%	6%	
I did not have any friends in the major	6%	6%	
The professors were not supportive	12%	16%	
I felt isolated in my program	31%	37%	
The department did not make me feel welcome	6%	11%	
I experienced health issues that inhibited my ability to feel/be successful	12%	17%	
Another reason	62%	45%	
None of the above	0%	4%	
n	16	1202	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.2.4 What helped you continue in your program when you were contemplating leaving?
Choose up to 3 responses.

	Your Institution (%)	Similar Institutions (%)	Sig.
My family encouraged/supported me	38%	41%	
My friends encouraged/supported me	6%	31%	
Professors/faculty encouraged/supported me	12%	29%	
I had already invested too much time and resources	50%	56%	
I liked the field of study	50%	50%	
The job market is promising	25%	24%	
Another reason	6%	12%	
None of the above	12%	1%	*
n	16	1201	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

4.3   Perceptions of the Department

Table 4.3.1 Please indicate the extent to which you disagree or agree with the following statements.
(1) Strongly disagree - (5) Strongly agree

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
Overall, I am satisfied with the computing program at my institution	4.38 (0.64)	3.99 (0.98)	*
I would recommend taking computing courses at my institution to a friend	4.19 (0.71)	4.03 (1.00)	
The number of students in my computing classes is too large	2.42 (1.11)	3.02 (1.19)	*
I am satisfied with the technical content of the computing courses	3.86 (1.20)	3.89 (0.98)	
The computing courses at my institution are too difficult	2.41 (0.96)	2.70 (1.02)	
n	37	2698	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.3.2 How dissatisfied or satisfied are you with the following aspects of the computing program at your institution?
(1) Very dissatisfied - (5) Very satisfied

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
The variety of computing courses offered	3.32 (1.20)	3.59 (1.15)	
Access to academic resources needed to do your work	4.35 (0.75)	4.00 (0.99)	*
The availability of professors/instructors outside of class (e.g., office hours, answering questions via email, etc.)	4.51 (0.65)	4.02 (0.98)	*
How well the program has prepared you for your future career	4.00 (0.82)	3.77 (1.00)	
The workload expected of you	3.92 (0.81)	3.61 (1.02)	*
n	36	2694	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.3.3 Rate how you feel about the environment of the department of your computing program.
(1) Strongly disagree - (5) Strongly agree

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
I feel a sense of community in the computing department	3.61 (1.18)	3.60 (1.11)	
People in the department often attribute my success to special treatment or luck, rather than my competence	1.97 (1.08)	2.24 (1.18)	
The environment in the computing department inspires me to do the best job that I can	3.61 (0.87)	3.62 (1.04)	
My ideas or opinions are minimized or ignored	1.92 (0.94)	2.29 (1.14)	*
The department cares about its students	4.08 (0.94)	3.94 (1.03)	
The department is NOT very supportive of its students	1.86 (0.83)	2.15 (1.14)	
Computer science administrators (e.g., the department chair, dean, staff) and faculty care about diversity	4.08 (1.00)	3.88 (1.00)	
n	36	2652	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.3.4 Do you have access to one or more academic advisor(s)?
Select all that apply

	Your Institution (%)	Similar Institutions (%)	Sig.
Yes, I have an academic advisor(s) affiliated with the computing department	86%	87%	
Yes, I have an academic advisor(s) affiliated with another department	14%	8%	
No, I do not have an advisor yet	8%	10%	
n	37	2702	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.3.5 About how many times per semester/quarter do you interact with academic advisor(s) for the following reasons?
(1) Never - (5) Four or more times

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
Course-related guidance	1.88 (0.89)	2.36 (1.00)	*
Career advice	2.58 (0.94)	2.25 (1.05)	
Graduate school advice	2.56 (1.08)	2.51 (1.08)	
Another reason	3.66 (0.79)	2.54 (1.22)	*
n	32	2275	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.3.6 How dissatisfied or satisfied are you with the following?
(1) Very dissatisfied - (5) Very satisfied

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
How often you meet with your advisor(s)	4.15 (0.94)	3.83 (1.17)	
The academic guidance your advisor(s) provides	4.36 (0.78)	3.86 (1.15)	*
The career advice your advisor(s) provides	4.21 (0.78)	3.71 (1.15)	*
n	33	2367	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

4.4   Support Structures

Table 4.4.1 Approximately how often do you interact with the following individuals?
(1) Never - (5) More than 3 times per week

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
Teaching assistants	1.91 (0.93)	2.48 (1.15)	*
An instructor/faculty member outside of lecture regarding a course	1.94 (1.04)	2.46 (1.09)	*
An instructor/faculty member outside of lecture NOT regarding a course	2.65 (1.43)	2.25 (1.20)	
Classmates outside of lecture	3.88 (1.17)	3.62 (1.29)	
n	34	2583	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.4.2 How often to you receive the following from other students if you need it?
(1) Not at all - (5) Very much

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
Help and support	3.78 (0.96)	3.63 (1.08)	
Willingness to listen to issues you are having at school	3.86 (0.87)	3.60 (1.12)	
Feedback about your work	3.49 (1.15)	3.51 (1.13)	
n	35	2646	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.4.3 To what extent do you have a mentor who:
(1) Not at all - (5) Very much

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
helps you improve your computing skills	3.43 (1.14)	2.97 (1.41)	*
shows compassion for any issues you discussed with them	3.85 (0.96)	3.39 (1.37)	*
shares personal experiences as an alternative perspective to your problem	3.71 (1.06)	3.23 (1.38)	*
explores career options with you	3.59 (1.08)	3.08 (1.41)	*
encourages you to do the best you can in your coursework	3.97 (1.22)	3.26 (1.44)	*
supports your research ideas	4.21 (1.04)	3.43 (1.41)	*
n	34	2575	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.4.4 Think about your relationships in computing. To what extent is each of the following available to you at this point?
(1) Not at all - (5) Very much

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
People with whom you can discuss professional development questions	3.92 (0.89)	3.66 (1.03)	
A strong network of peers to interact with at conferences	3.27 (1.12)	3.05 (1.23)	
A strong network of mentors to interact with at conferences	3.03 (1.17)	2.90 (1.24)	
People who would be excited to learn about your professional successes	3.65 (1.06)	3.34 (1.13)	
People with whom you can discuss issues you are having	3.59 (1.04)	3.40 (1.12)	
n	37	2782	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

4.5 Self-perceptions

Table 4.5.1 Please indicate the extent to which you disagree or agree with the following statements.
(1) Strongly Disagree - (5) Strongly Agree

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
I see myself as a computing person	3.89 (0.88)	4.12 (0.93)	
I feel like I belong in computing	3.70 (1.00)	3.99 (0.99)	
I feel like an outsider in computing	2.35 (1.06)	2.21 (1.18)	
Computing is a big part of who I am	3.68 (0.91)	3.76 (1.07)	
I feel welcomed in computing	3.84 (0.93)	3.87 (0.95)	
I do not have much in common with the other students in my computing classes	2.65 (1.23)	2.62 (1.15)	
n	37	2811	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.5.2 In your opinion, to what extent are each of the following statements true of you?
(1) Not at all - (5) Very much

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
I can give the impression that I'm more competent than I really am	3.27 (1.12)	3.22 (1.24)	
When others praise me for something I have accomplished, I'm afraid I won't be able to live up to their expectations of me in the future	3.14 (1.16)	3.08 (1.28)	
At times, I feel my success has been due to some kind of luck	3.16 (1.42)	2.91 (1.32)	
I'm disappointed at times in my present accomplishments and think I should have accomplished much more by now	4.03 (1.09)	3.43 (1.29)	*
n	37	2744	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.5.3 I am confident that I can:
(1) Strongly disagree - (5) Strongly agree

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
clearly communicate technical problems and solutions to a range of audiences	4.00 (0.75)	4.11 (0.85)	
articulate thoughtful answers to theoretical questions about your work during a presentation	4.05 (0.78)	4.09 (0.85)	
introduce myself to new peers/colleagues at professional meetings	4.00 (0.85)	4.01 (0.95)	
be a capable researcher in computing	3.97 (0.73)	3.88 (0.96)	
find employment in an area of computing interest	4.00 (0.71)	4.21 (0.83)	
successfully teach a course in my field	4.08 (0.83)	3.88 (1.05)	
be an effective mentor	3.86 (0.82)	4.02 (0.91)	
become an expert in my field	4.03 (0.83)	4.11 (0.87)	
discuss my work with senior members of my field	4.19 (0.62)	4.15 (0.83)	
publish in tier 1 conferences and journals in my field	4.03 (0.96)	3.66 (1.15)	*
complete my graduate degree program	4.54 (0.65)	4.53 (0.74)	
n	37	2757	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.5.4 In your opinion, to what extent would a career in computing allow you to do the following.
(1) Not at all - (5) Extremely

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
Serve humanity	3.50 (0.94)	3.77 (1.01)	
Be in a position of influence in society	3.43 (1.12)	3.69 (1.07)	
Spend at lot of time with family	3.16 (0.90)	3.25 (1.02)	
n	37	2879	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

4.6 Activities

Table 4.6.1 How often have you been involved in each of the following groups or activities?
(1) Never - (5) Four or more times

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
Internships related to computing	2.45 (0.99)	2.15 (0.99)	
Jobs related to computing	1.63 (0.93)	1.99 (1.01)	*
Career mentoring programs or workshops	1.61 (0.95)	1.88 (0.97)	
Outreach to K-12 students related to computing	1.26 (0.68)	1.60 (0.97)	*
Computing-related student groups (e.g., technical organizations on campus, ACM student chapters, etc.)	1.77 (0.92)	2.00 (1.00)	
Other student groups (e.g., Greek Life, volunteer groups, academic merit societies, etc.)	1.77 (1.09)	1.91 (1.05)	
n	31	2503	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.6.2 How often have you been involved in each of the following groups or activities?
(1) Never - (5) Four or more times

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
Submitted a poster proposal to a conference	2.42 (1.18)	1.81 (1.00)	*
Submitted a paper proposal to a conference	3.06 (1.00)	2.03 (1.13)	*
Submitted a paper for publication in a peer reviewed journal	1.71 (1.04)	1.58 (0.88)	
Presented a poster at a conference	2.32 (1.17)	1.74 (0.96)	*
Given an oral presentation at a conference	2.19 (1.01)	1.73 (0.95)	*
Had a paper accepted for publication in conference proceedings	2.61 (1.15)	1.85 (1.03)	*
Had a paper accepted for publication in a peer reviewed journal	1.45 (0.81)	1.47 (0.81)	
n	31	2510	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.6.3 During your academic career to date, have you participated in any of the following conferences or programs?
Select all that apply

	Your Institution (%)	Similar Institutions (%)	Sig.
ACM Richard Tapia Celebration of Diversity in Computing	0%	4%	
Grace Hopper Celebration of Women in Computing	0%	9%	
CRA-WP Grad Cohort for Women	0%	8%	
CRA/CRA-WP Grad Cohort for Underrepresented Minorities + Persons with Disabilities	0%	2%	
Local events related to diversity in computing	4%	12%	
None of these	96%	76%	*
n	28	2403	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.6.4 During your academic career to date, have you pursued any of the following resources at your institution?
Select all that apply

	Your Institution (%)	Similar Institutions (%)	Sig.
Peer tutoring	7%	19%	
Tutoring offered by your department/college	14%	14%	
Peer mentoring	17%	17%	
Career counseling	7%	21%	
Mental health counseling	34%	19%	
Does not apply to me	41%	48%	
n	29	2408	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

4.7   Future Plans and Interests

Table 4.7.1 For your future career, in which setting would you like to work the most?

	Your Institution (%)	Similar Institutions (%)	Sig.
Academia	68%	26%	*
Industry	30%	60%	*
Government	0%	4%	
Self-employment	3%	8%	
Something else	0%	2%	
n	37	2877	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.7.2 How interested are you in having a career:
(1) Not at all interested - (5) Extremely interested

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
doing computing-related work	4.14 (1.00)	4.46 (0.79)	
in computing research	4.41 (0.90)	3.78 (1.20)	*
n	37	2878	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.7.3 How interested are you in having the types of jobs listed below after you finish your highest degree?
(1) Very uninterested - (5) Very interested

	Your Institution Mean (SD)	Similar Institutions Mean (SD)	Sig.
College or university professor in computing field (teaching focused)	3.46 (1.28)	3.10 (1.33)	
College or university professor in computing field (research focused)	4.35 (1.01)	3.37 (1.36)	*
K-12 computing teacher	2.00 (1.00)	2.23 (1.19)	
Computing researcher in industry	4.27 (0.77)	3.91 (1.16)	*
Computing researcher in a government lab or agency	3.57 (1.14)	3.51 (1.24)	
A non-research computing position in industry (e.g., software engineer)	3.08 (1.21)	3.51 (1.29)	*
A non-research computing position in government	2.27 (1.17)	2.93 (1.33)	*
Entrepreneur (computing related; e.g., individual contractor, build a start-up)	3.05 (1.22)	3.39 (1.31)	
Non-computing career	1.89 (1.13)	2.08 (1.16)	
n	37	2815	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.7.4 What is the highest degree you plan to attain?

	Your Institution (%)	Similar Institutions (%)	Sig.
Associate's degree	0%	0%	
Bachelor's degree	0%	0%	
Master's degree	11%	42%	*
Doctoral degree	89%	58%	*
None of the above	0%	0%	N/A
n	37	2931	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Table 4.7.5 Do you intend to earn/ have your earned your highest degree in a computing-related field?

	Your Institution (%)	Similar Institutions (%)	Sig.
No	3%	4%	
Yes	97%	96%	
n	37	2896	

(*) $p \leq .05$ and Cohen's d or $h \geq .30$; (N/A) $n < 5$ or test criteria were not met

Chapter 5

Graduate Students: Results by Gender

Data for individuals who do not identify as either a woman or a man are not included in this report due to small samples sizes.

5.1 Student Background

Table 5.1.1 Which of the following experiences did you have prior to entering college?
Select all that apply

	Your Institution			Similar Institutions		
	Women (%)	Men (%)	Sig.	Women (%)	Men (%)	Sig.
Took AP Computer Science A	N/A	26%	N/A	15%	22%	
Took AP Computer Science Principles	N/A	4%	N/A	7%	7%	
Took other AP courses	N/A	37%	N/A	30%	26%	
Took dual enrollment courses	N/A	4%	N/A	8%	8%	
Learned a computer programming language	N/A	70%	N/A	50%	63%	
Engaged in software or hardware related projects	N/A	44%	N/A	38%	50%	
Took part in student groups related to computing	N/A	37%	N/A	20%	25%	
Completed an online course related to computing (e.g., MOOC)	N/A	7%	N/A	16%	24%	
Attended a workshop or other training in computing (e.g., through your local library, community center, etc.)	N/A	11%	N/A	17%	18%	
None of the above	N/A	11%	N/A	23%	17%	
n	4	27		901	1636	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.1.2 Which of the following mathematics courses did you take prior to entering college?
Select all that apply

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	(%)	(%)	Sig.	(%)	(%)	Sig.
Algebra I	N/A	81%	N/A	89%	89%	
Algebra II	N/A	70%	N/A	81%	81%	
Trigonometry	N/A	81%	N/A	78%	79%	
Pre-calculus	N/A	74%	N/A	77%	78%	
Calculus	N/A	74%	N/A	78%	76%	
Statistics	N/A	37%	N/A	53%	55%	
None of the above	N/A	7%	N/A	4%	4%	
n	4	27		899	1635	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.1.3 Which of the following applies to you?
Select all that apply

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	(%)	(%)	Sig.	(%)	(%)	Sig.
I temporarily withdrew from my current institution	N/A	0%	N/A	1%	1%	
I have taken courses for credit at a community college	N/A	7%	N/A	11%	11%	
I have completed a degree/certification at a community college	N/A	0%	N/A	4%	5%	
None of the above	N/A	93%	N/A	85%	86%	
n	4	28		883	1609	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.1.4 Is your current degree program in a computing field?

	Your Institution			Similar Institutions		
	Women (%)	Men (%)	Sig.	Women (%)	Men (%)	Sig.
Yes	N/A	96%	N/A	98%	98%	
n	4	28		893	1632	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.1.5 In what year do you expect to complete your current degree program?

	Your Institution			Similar Institutions		
	Women (%)	Men (%)	Sig.	Women (%)	Men (%)	Sig.
2019	N/A	0%	N/A	4%	5%	
2020	N/A	29%	N/A	36%	34%	
2021	N/A	25%	N/A	30%	32%	
2022	N/A	21%	N/A	12%	11%	
2023	N/A	21%	N/A	11%	9%	
2024	N/A	4%	N/A	7%	8%	
2025 or later	N/A	0%	N/A	0%	0%	
n	4	28		880	1601	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.1.6 Have you experienced any economic hardships during your program that made you consider, or led you to, a leave of absence?

	Your Institution			Similar Institutions		
	Women (%)	Men (%)	Sig.	Women (%)	Men (%)	Sig.
Yes	N/A	0%	N/A	16%	18%	
n	4	28		891	1625	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.1.7 Do you have any type of disability (e.g., physical, learning, mental, etc.)?

	Your Institution			Similar Institutions		
	Women (%)	Men (%)	Sig.	Women (%)	Men (%)	Sig.
Yes	N/A	7%	N/A	7%	5%	
n	4	28		891	1626	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

5.2 Entering and Exiting the Field

Table 5.2.1 Why did you choose your degree program?
Choose up to 3 responses.

	Your Institution			Similar Institutions		
	Women (%)	Men (%)	Sig.	Women (%)	Men (%)	Sig.
I like learning about this field	N/A	73%	N/A	67%	76%	
My friends are enrolled in this program	N/A	0%	N/A	1%	1%	
The courses required of this program are interesting	N/A	8%	N/A	22%	23%	
Professors/faculty at my institution influenced my decision	N/A	38%	N/A	26%	21%	
The program will allow me to make an impact on society	N/A	12%	N/A	29%	28%	
The job market for this field is promising	N/A	12%	N/A	37%	39%	
I want to pursue research in this field	N/A	85%	N/A	41%	40%	
This program will enable me to make a lot of money	N/A	0%	N/A	8%	10%	
My family influenced my decision	N/A	0%	N/A	4%	3%	
I will be successful completing the coursework required of this program	N/A	0%	N/A	7%	6%	
I aspire to make a difference in this field	N/A	31%	N/A	22%	21%	
Another reason	N/A	0%	N/A	4%	4%	
None of the above	N/A	0%	N/A	0%	0%	
n	4	26		867	1583	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.2.2 During your studies at your current institution, how often have you considered leaving your degree program before completing it?
(1) Never - (5) All the time

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
During your studies at your current institution, how often have you considered leaving your degree program before completing it?	N/A	1.64 (0.83)	N/A	1.84 (1.05)	1.60 (0.92)	
n	4	28		892	1629	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \le .05$ and Cohen's d or $h \ge .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.2.3 Why did you think about leaving computing?
Choose up to 3 responses.

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	(%)	(%)	Sig.	(%)	(%)	Sig.
The courses were difficult	N/A	8%	N/A	17%	15%	
The math requirements were too hard	N/A	0%	N/A	3%	5%	
I was interested in trying something new	N/A	0%	N/A	12%	14%	
I did not like the course material	N/A	0%	N/A	10%	11%	
I was having trouble passes my courses	N/A	0%	N/A	7%	5%	
I did not have any friends in the major	N/A	0%	N/A	7%	5%	
The professors were not supportive	N/A	17%	N/A	17%	16%	
I felt isolated in my program	N/A	17%	N/A	45%	31%	
The department did not make me feel welcome	N/A	8%	N/A	10%	11%	
I experienced health issues that inhibited my ability to feel/be successful	N/A	8%	N/A	21%	14%	
Another reason	N/A	75%	N/A	44%	47%	
None of the above	N/A	0%	N/A	2%	5%	
n	1	12		429	621	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \le .05$ and Cohen's d or $h \ge .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.2.4 What helped you continue in your program when you were contemplating leaving?
Choose up to 3 responses.

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	(%)	(%)	Sig.	(%)	(%)	Sig.
My family encouraged/supported me	N/A	33%	N/A	45%	40%	
My friends encouraged/supported me	N/A	8%	N/A	38%	26%	
Professors/faculty encouraged/supported me	N/A	17%	N/A	30%	27%	
I had already invested too much time and resources	N/A	33%	N/A	63%	52%	
I liked the field of study	N/A	67%	N/A	43%	54%	
The job market is promising	N/A	8%	N/A	24%	24%	
Another reason	N/A	8%	N/A	9%	14%	
None of the above	N/A	17%	N/A	0%	1%	
n	1	12		431	616	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

5.3 Perceptions of the Department

Table 5.3.1 Please indicate the extent to which you disagree or agree with the following statements.
(1) Strongly disagree - (5) Strongly agree

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Overall, I am satisfied with the computing program at my institution	N/A	4.39 (0.69)	N/A	3.98 (0.96)	4.01 (0.99)	
I would recommend taking computing courses at my institution to a friend	N/A	4.19 (0.79)	N/A	3.99 (1.01)	4.05 (0.98)	
The number of students in my computing classes is too large	N/A	2.44 (1.19)	N/A	2.98 (1.19)	3.01 (1.19)	
I am satisfied with the technical content of the computing courses	N/A	3.89 (1.22)	N/A	3.84 (1.02)	3.92 (0.96)	
The computing courses at my institution are too difficult	N/A	2.32 (0.90)	N/A	2.73 (1.03)	2.67 (1.00)	
n	4	28		869	1587	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.3.2 How dissatisfied or satisfied are you with the following aspects of the computing program at your institution?
(1) Very dissatisfied - (5) Very satisfied

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
The variety of computing courses offered	N/A	3.46 (1.26)	N/A	3.59 (1.15)	3.59 (1.15)	
Access to academic resources needed to do your work	N/A	4.43 (0.74)	N/A	3.96 (1.03)	4.04 (0.98)	
The availability of professors/instructors outside of class (e.g., office hours, answering questions via email, etc.)	N/A	4.61 (0.57)	N/A	4.01 (1.02)	4.02 (0.98)	
How well the program has prepared you for your future career	N/A	4.04 (0.84)	N/A	3.71 (1.01)	3.81 (1.00)	
The workload expected of you	N/A	4.07 (0.78)	N/A	3.56 (1.04)	3.63 (1.01)	
n	4	27		868	1586	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.3.3 Rate how you feel about the environment of the department of your computing program.
(1) Strongly disagree - (5) Strongly agree

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
I feel a sense of community in the computing department	N/A	3.59 (1.19)	N/A	3.55 (1.13)	3.65 (1.09)	
People in the department often attribute my success to special treatment or luck, rather than my competence	N/A	1.78 (0.93)	N/A	2.29 (1.17)	2.18 (1.17)	
The environment in the computing department inspires me to do the best job that I can	N/A	3.63 (0.93)	N/A	3.58 (1.08)	3.67 (1.02)	
My ideas or opinions are minimized or ignored	N/A	1.81 (0.92)	N/A	2.33 (1.13)	2.23 (1.13)	
The department cares about its students	N/A	4.11 (1.01)	N/A	3.94 (1.02)	3.95 (1.04)	
The department is NOT very supportive of its students	N/A	1.85 (0.91)	N/A	2.16 (1.12)	2.13 (1.16)	
Computer science administrators (e.g., the department chair, dean, staff) and faculty care about diversity	N/A	4.00 (1.00)	N/A	3.86 (1.05)	3.91 (0.98)	
n	4	27		862	1580	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.3.4 Do you have access to one or more academic advisor(s)?
Select all that apply

	Your Institution			Similar Institutions		
	Women (%)	Men (%)	Sig.	Women (%)	Men (%)	Sig.
Yes, I have an academic advisor(s) affiliated with the computing department	N/A	86%	N/A	88%	87%	
Yes, I have an academic advisor(s) affiliated with another department	N/A	14%	N/A	11%	7%	
No, I do not have an advisor yet	N/A	11%	N/A	8%	11%	
n	4	28		878	1607	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.3.5 About how many times per semester/quarter do you interact with academic advisor(s) for the following reasons?
(1) Never - (5) Four or more times

	Your Institution			Similar Institutions		
	Women Mean (SD)	Men Mean (SD)	Sig.	Women Mean (SD)	Men Mean (SD)	Sig.
Course-related guidance	N/A	1.92 (0.97)	N/A	2.32 (0.97)	2.37 (1.01)	
Career advice	N/A	2.67 (1.01)	N/A	2.27 (1.06)	2.26 (1.04)	
Graduate school advice	N/A	2.57 (1.12)	N/A	2.49 (1.10)	2.52 (1.07)	
Another reason	N/A	3.71 (0.75)	N/A	2.59 (1.22)	2.52 (1.22)	
n	4	24		758	1359	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.3.6 How dissatisfied or satisfied are you with the following?
(1) Very dissatisfied - (5) Very satisfied

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
How often you meet with your advisor(s)	N/A	4.29 (0.95)	N/A	3.86 (1.19)	3.84 (1.15)	
The academic guidance your advisor(s) provides	N/A	4.54 (0.59)	N/A	3.85 (1.19)	3.88 (1.11)	
The career advice your advisor(s) provides	N/A	4.42 (0.72)	N/A	3.70 (1.21)	3.73 (1.11)	
n	4	24		794	1405	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \le .05$ and Cohen's d or $h \ge .30$, (N/A) $n < 5$ or test criteria were not met

5.4 Support Structures

Table 5.4.1 Approximately how often do you interact with the following individuals?
(1) Never - (5) More than 3 times per week

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Teaching assistants	N/A	1.89 (0.97)	N/A	2.45 (1.17)	2.49 (1.14)	
An instructor/faculty member outside of lecture regarding a course	N/A	1.96 (1.09)	N/A	2.39 (1.07)	2.50 (1.10)	
An instructor/faculty member outside of lecture NOT regarding a course	N/A	2.59 (1.47)	N/A	2.19 (1.16)	2.29 (1.22)	
Classmates outside of lecture	N/A	3.85 (1.23)	N/A	3.59 (1.32)	3.64 (1.28)	
n	4	27		849	1571	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \le .05$ and Cohen's d or $h \ge .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.4.2 How often to you receive the following from other students if you need it?
(1) Not at all - (5) Very much

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Help and support	N/A	3.89 (0.89)	N/A	3.68 (1.10)	3.61 (1.07)	
Willingness to listen to issues you are having at school	N/A	3.93 (0.87)	N/A	3.66 (1.12)	3.58 (1.12)	
Feedback about your work	N/A	3.69 (1.09)	N/A	3.52 (1.14)	3.51 (1.12)	
n	4	26		861	1575	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.4.3 To what extent do you have a mentor who:
(1) Not at all - (5) Very much

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
helps you improve your computing skills	N/A	3.57 (1.10)	N/A	2.88 (1.42)	3.01 (1.41)	
shows compassion for any issues you discussed with them	N/A	3.93 (0.92)	N/A	3.51 (1.35)	3.34 (1.39)	
shares personal experiences as an alternative perspective to your problem	N/A	3.70 (1.14)	N/A	3.28 (1.37)	3.22 (1.40)	
explores career options with you	N/A	3.74 (0.98)	N/A	3.17 (1.41)	3.05 (1.41)	
encourages you to do the best you can in your coursework	N/A	4.04 (1.19)	N/A	3.30 (1.43)	3.26 (1.45)	
supports your research ideas	N/A	4.33 (0.96)	N/A	3.47 (1.38)	3.43 (1.44)	
n	4	27		850	1562	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.4.4 Think about your relationships in computing. To what extent is each of the following available to you at this point?
(1) Not at all - (5) Very much

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
People with whom you can discuss professional development questions	N/A	4.07 (0.90)	N/A	3.63 (1.06)	3.69 (1.02)	
A strong network of peers to interact with at conferences	N/A	3.43 (1.17)	N/A	3.04 (1.25)	3.06 (1.23)	
A strong network of mentors to interact with at conferences	N/A	3.18 (1.16)	N/A	2.84 (1.27)	2.93 (1.24)	
People who would be excited to learn about your professional successes	N/A	3.93 (0.86)	N/A	3.33 (1.15)	3.34 (1.13)	
People with whom you can discuss issues you are having	N/A	3.79 (1.03)	N/A	3.37 (1.13)	3.43 (1.12)	
n	4	28		880	1599	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

5.5   Self-perceptions

Table 5.5.1 Please indicate the extent to which you disagree or agree with the following statements.
(1) Strongly Disagree - (5) Strongly Agree

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
I see myself as a computing person	N/A	3.93 (0.90)	N/A	3.97 (1.00)	4.21 (0.87)	
I feel like I belong in computing	N/A	3.64 (0.99)	N/A	3.79 (1.08)	4.11 (0.91)	*
I feel like an outsider in computing	N/A	2.32 (0.98)	N/A	2.54 (1.24)	2.03 (1.10)	*
Computing is a big part of who I am	N/A	3.68 (0.94)	N/A	3.57 (1.15)	3.88 (1.00)	
I feel welcomed in computing	N/A	4.00 (0.77)	N/A	3.65 (1.01)	3.99 (0.89)	*
I do not have much in common with the other students in my computing classes	N/A	2.68 (1.31)	N/A	2.76 (1.17)	2.52 (1.12)	
n	4	28		883	1602	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.5.2 In your opinion, to what extent are each of the following statements true of you?
(1) Not at all - (5) Very much

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
I can give the impression that I'm more competent than I really am	N/A	3.32 (1.02)	N/A	3.14 (1.27)	3.29 (1.21)	
When others praise me for something I have accomplished, I'm afraid I won't be able to live up to their expectations of me in the future	N/A	3.04 (1.20)	N/A	3.24 (1.28)	2.99 (1.27)	
At times, I feel my success has been due to some kind of luck	N/A	3.00 (1.39)	N/A	2.96 (1.36)	2.88 (1.31)	
I'm disappointed at times in my present accomplishments and think I should have accomplished much more by now	N/A	4.11 (1.10)	N/A	3.44 (1.34)	3.43 (1.28)	
n	4	28		879	1595	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.5.3 I am confident that I can:
(1) Strongly disagree - (5) Strongly agree

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
clearly communicate technical problems and solutions to a range of audiences	N/A	4.14 (0.59)	N/A	3.99 (0.92)	4.19 (0.79)	
articulate thoughtful answers to theoretical questions about your work during a presentation	N/A	4.11 (0.74)	N/A	4.00 (0.90)	4.16 (0.80)	
introduce myself to new peers/colleagues at professional meetings	N/A	4.07 (0.77)	N/A	3.96 (1.00)	4.03 (0.93)	
be a capable researcher in computing	N/A	4.04 (0.74)	N/A	3.83 (0.98)	3.92 (0.95)	
find employment in an area of computing interest	N/A	4.07 (0.77)	N/A	4.15 (0.83)	4.25 (0.82)	
successfully teach a course in my field	N/A	4.14 (0.80)	N/A	3.77 (1.06)	3.95 (1.02)	
be an effective mentor	N/A	3.89 (0.83)	N/A	3.99 (0.92)	4.04 (0.91)	
become an expert in my field	N/A	4.18 (0.77)	N/A	3.94 (0.94)	4.19 (0.82)	
discuss my work with senior members of my field	N/A	4.29 (0.60)	N/A	4.03 (0.88)	4.22 (0.80)	
publish in tier 1 conferences and journals in my field	N/A	4.11 (0.96)	N/A	3.60 (1.12)	3.71 (1.16)	
complete my graduate degree program	N/A	4.54 (0.69)	N/A	4.47 (0.76)	4.57 (0.71)	
n	4	28		879	1597	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.5.4 In your opinion, to what extent would a career in computing allow you to do the following.
(1) Not at all - (5) Extremely

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Serve humanity	N/A	3.46 (0.92)	N/A	3.78 (0.96)	3.76 (1.02)	
Be in a position of influence in society	N/A	3.39 (1.10)	N/A	3.73 (1.06)	3.67 (1.06)	
Spend at lot of time with family	N/A	3.29 (0.90)	N/A	3.15 (1.02)	3.31 (1.01)	
n	4	28		887	1611	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

5.6 Activities

Table 5.6.1 How often have you been involved in each of the following groups or activities?
(1) Never - (5) Four or more times

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Internships related to computing	N/A	2.44 (1.05)	N/A	2.15 (0.98)	2.14 (0.99)	
Jobs related to computing	N/A	1.62 (0.94)	N/A	1.84 (0.96)	2.07 (1.04)	
Career mentoring programs or workshops	N/A	1.56 (0.97)	N/A	2.05 (0.99)	1.78 (0.95)	
Outreach to K-12 students related to computing	N/A	1.22 (0.64)	N/A	1.77 (1.05)	1.49 (0.90)	
Computing-related student groups (e.g., technical organizations on campus, ACM student chapters, etc.)	N/A	1.85 (0.95)	N/A	2.08 (1.00)	1.96 (1.00)	
Other student groups (e.g., Greek Life, volunteer groups, academic merit societies, etc.)	N/A	1.74 (1.06)	N/A	2.03 (1.06)	1.83 (1.03)	
n	3	27		835	1548	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.6.2 How often have you been involved in each of the following groups or activities?
(1) Never - (5) Four or more times

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Submitted a poster proposal to a conference	N/A	2.41 (1.22)	N/A	1.88 (1.02)	1.76 (0.99)	
Submitted a paper proposal to a conference	N/A	3.07 (1.04)	N/A	2.06 (1.14)	2.02 (1.13)	
Submitted a paper for publication in a peer reviewed journal	N/A	1.74 (1.06)	N/A	1.57 (0.84)	1.59 (0.89)	
Presented a poster at a conference	N/A	2.30 (1.20)	N/A	1.84 (0.99)	1.69 (0.94)	
Given an oral presentation at a conference	N/A	2.22 (1.05)	N/A	1.78 (0.97)	1.71 (0.94)	
Had a paper accepted for publication in conference proceedings	N/A	2.67 (1.21)	N/A	1.86 (1.03)	1.86 (1.04)	
Had a paper accepted for publication in a peer reviewed journal	N/A	1.44 (0.80)	N/A	1.45 (0.78)	1.48 (0.82)	
n	3	27		837	1556	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.6.3 During your academic career to date, have you participated in any of the following conferences or programs?
Select all that apply

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	(%)	(%)	Sig.	(%)	(%)	Sig.
ACM Richard Tapia Celebration of Diversity in Computing	N/A	0%	N/A	5%	3%	
Grace Hopper Celebration of Women in Computing	N/A	0%	N/A	25%	1%	*
CRA-WP Grad Cohort for Women	N/A	0%	N/A	22%	0%	*
CRA/CRA-WP Grad Cohort for Underrepresented Minorities + Persons with Disabilities	N/A	0%	N/A	3%	2%	
Local events related to diversity in computing	N/A	0%	N/A	18%	8%	*
None of these	N/A	100%	N/A	54%	89%	*
n	3	24		832	1470	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.6.4 During your academic career to date, have you pursued any of the following resources at your institution?
Select all that apply

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	(%)	(%)	Sig.	(%)	(%)	Sig.
Peer tutoring	N/A	9%	N/A	19%	18%	
Tutoring offered by your department/college	N/A	17%	N/A	13%	14%	
Peer mentoring	N/A	22%	N/A	21%	15%	
Career counseling	N/A	9%	N/A	24%	20%	
Mental health counseling	N/A	22%	N/A	29%	13%	*
Does not apply to me	N/A	48%	N/A	38%	54%	*
n	4	23		821	1476	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

5.7 Future Plans and Interests

Table 5.7.1 For your future career, in which setting would you like to work the most?

	Your Institution			Similar Institutions		
	Women (%)	Men (%)	Sig.	Women (%)	Men (%)	Sig.
Academia	N/A	71%	N/A	28%	26%	
Industry	N/A	25%	N/A	59%	60%	
Government	N/A	0%	N/A	5%	4%	
Self-employment	N/A	4%	N/A	5%	9%	
Something else	N/A	0%	N/A	2%	1%	
n	4	28		889	1619	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.7.2 How interested are you in having a career:
(1) Not at all interested - (5) Extremely interested

	Your Institution			Similar Institutions		
	Women Mean (SD)	Men Mean (SD)	Sig.	Women Mean (SD)	Men Mean (SD)	Sig.
doing computing-related work	N/A	4.29 (0.98)	N/A	4.36 (0.85)	4.51 (0.75)	
in computing research	N/A	4.50 (0.79)	N/A	3.72 (1.24)	3.82 (1.17)	
n	4	28		888	1618	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.7.3 How interested are you in having the types of jobs listed below after you finish your highest degree?
(1) Very uninterested - (5) Very interested

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
College or university professor in computing field (teaching focused)	N/A	3.61 (1.23)	N/A	3.08 (1.36)	3.13 (1.31)	
College or university professor in computing field (research focused)	N/A	4.50 (0.92)	N/A	3.24 (1.41)	3.47 (1.32)	
K-12 computing teacher	N/A	1.89 (0.96)	N/A	2.27 (1.20)	2.20 (1.17)	
Computing researcher in industry	N/A	4.32 (0.77)	N/A	3.82 (1.21)	3.97 (1.12)	
Computing researcher in a government lab or agency	N/A	3.71 (1.12)	N/A	3.48 (1.26)	3.54 (1.22)	
A non-research computing position in industry (e.g., software engineer)	N/A	2.96 (1.14)	N/A	3.38 (1.35)	3.57 (1.25)	
A non-research computing position in government	N/A	2.21 (1.13)	N/A	2.92 (1.37)	2.94 (1.32)	
Entrepreneur (computing related; e.g., individual contractor, build a start-up)	N/A	3.21 (1.20)	N/A	3.14 (1.36)	3.53 (1.26)	
Non-computing career	N/A	1.86 (1.15)	N/A	2.23 (1.20)	1.99 (1.13)	
n	4	28		875	1595	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.7.4 What is the highest degree you plan to attain?

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	(%)	(%)	Sig.	(%)	(%)	Sig.
Associate's degree	N/A	0%	N/A	0%	0%	
Bachelor's degree	N/A	0%	N/A	0%	0%	
Master's degree	N/A	4%	N/A	38%	42%	
Doctoral degree	N/A	96%	N/A	61%	58%	
None of the above	N/A	0%	N/A	0%	0%	N/A
n	4	28		892	1629	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 5.7.5 Do you intend to earn/ have your earned your highest degree in a computing-related field?

	Your Institution			Similar Institutions		
	Women	Men		Women	Men	
	(%)	(%)	Sig.	(%)	(%)	Sig.
No	N/A	4%	N/A	5%	3%	
Yes	N/A	96%	N/A	95%	97%	
n	4	28		884	1616	

This table presents data for women and men only due to small sample sizes at each institution for other gender identities.

Data are compared between women and men at your institution, and women and men at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Chapter 6

Graduate Students: Results by Race/Ethnicity

6.1 Student Background

Table 6.1.1 Which of the following experiences did you have prior to entering college?
Select all that apply

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	(%)	(%)	Sig.	(%)	(%)	Sig.
Took AP Computer Science A	27%	N/A	N/A	20%	12%	
Took AP Computer Science Principles	0%	N/A	N/A	7%	2%	
Took other AP courses	43%	N/A	N/A	27%	37%	
Took dual enrollment courses	13%	N/A	N/A	8%	12%	
Learned a computer programming language	70%	N/A	N/A	61%	39%	*
Engaged in software or hardware related projects	40%	N/A	N/A	48%	30%	*
Took part in student groups related to computing	30%	N/A	N/A	24%	16%	
Completed an online course related to computing (e.g., MOOC)	10%	N/A	N/A	22%	10%	*
Attended a workshop or other training in computing (e.g., through your local library, community center, etc.)	13%	N/A	N/A	18%	14%	
None of the above	13%	N/A	N/A	18%	25%	
n	30	2		2219	232	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.1.2 Which of the following mathematics courses did you take prior to entering college?
Select all that apply

	Your Institution			Similar Institutions		
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
Algebra I	83%	N/A	N/A	90%	90%	
Algebra II	73%	N/A	N/A	82%	84%	
Trigonometry	87%	N/A	N/A	80%	76%	
Pre-calculus	83%	N/A	N/A	79%	76%	
Calculus	73%	N/A	N/A	78%	61%	*
Statistics	40%	N/A	N/A	55%	37%	*
None of the above	3%	N/A	N/A	4%	4%	
n	30	2		2214	231	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.1.3 Which of the following applies to you?
Select all that apply

	Your Institution			Similar Institutions		
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
I temporarily withdrew from my current institution	0%	N/A	N/A	1%	1%	
I have taken courses for credit at a community college	10%	N/A	N/A	11%	20%	
I have completed a degree/certification at a community college	0%	N/A	N/A	4%	8%	
None of the above	90%	N/A	N/A	86%	77%	
n	31	2		2182	225	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.1.4 Is your current degree program in a computing field?

	Your Institution			Similar Institutions		
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
Yes	97%	N/A	N/A	98%	96%	
n	31	2		2209	231	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.1.5 In what year do you expect to complete your current degree program?

	Your Institution			Similar Institutions		
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
2019	0%	N/A	N/A	5%	4%	
2020	29%	N/A	N/A	35%	35%	
2021	26%	N/A	N/A	32%	28%	
2022	23%	N/A	N/A	11%	14%	
2023	16%	N/A	N/A	10%	11%	
2024	6%	N/A	N/A	8%	8%	
2025 or later	0%	N/A	N/A	0%	0%	
n	31	2		2171	227	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.1.6 Have you experienced any economic hardships during your program that made you consider, or led you to, a leave of absence?

	Your Institution			Similar Institutions		
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
Yes	0%	N/A	N/A	15%	30%	*
n	31	2		2205	230	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.1.7 Do you have any type of disability (e.g., physical, learning, mental, etc.)?

	Your Institution			Similar Institutions		
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
Yes	6%	N/A	N/A	6%	10%	
n	31	2		2205	229	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

6.2 Entering and Exiting the Field

Table 6.2.1 Why did you choose your degree program?
Choose up to 3 responses.

	Your Institution			Similar Institutions		
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
I like learning about this field	69%	N/A	N/A	74%	66%	
My friends are enrolled in this program	3%	N/A	N/A	1%	1%	
The courses required of this program are interesting	3%	N/A	N/A	24%	15%	
Professors/faculty at my institution influenced my decision	38%	N/A	N/A	22%	26%	
The program will allow me to make an impact on society	17%	N/A	N/A	27%	37%	
The job market for this field is promising	17%	N/A	N/A	38%	37%	
I want to pursue research in this field	79%	N/A	N/A	40%	44%	
This program will enable me to make a lot of money	0%	N/A	N/A	9%	9%	
My family influenced my decision	0%	N/A	N/A	3%	4%	
I will be successful completing the coursework required of this program	3%	N/A	N/A	7%	5%	
I aspire to make a difference in this field	31%	N/A	N/A	21%	24%	
Another reason	0%	N/A	N/A	4%	7%	
None of the above	0%	N/A	N/A	0%	0%	
n	29	2		2149	221	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.2.2 During your studies at your current institution, how often have you considered leaving your degree program before completing it?
(1) Never - (5) All the time

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
During your studies at your current institution, how often have you considered leaving your degree program before completing it?	1.71 (0.90)	N/A	N/A	1.67 (0.97)	1.99 (1.11)	*
n	31	2		2207	231	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.2.3 Why did you think about leaving computing?
Choose up to 3 responses.

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	(%)	(%)	Sig.	(%)	(%)	Sig.
The courses were difficult	14%	N/A	N/A	16%	17%	
The math requirements were too hard	0%	N/A	N/A	4%	3%	
I was interested in trying something new	7%	N/A	N/A	13%	14%	
I did not like the course material	0%	N/A	N/A	10%	12%	
I was having trouble passes my courses	0%	N/A	N/A	5%	10%	
I did not have any friends in the major	7%	N/A	N/A	5%	8%	
The professors were not supportive	14%	N/A	N/A	16%	15%	
I felt isolated in my program	29%	N/A	N/A	35%	41%	
The department did not make me feel welcome	7%	N/A	N/A	10%	15%	
I experienced health issues that inhibited my ability to feel/be successful	14%	N/A	N/A	17%	18%	
Another reason	64%	N/A	N/A	45%	53%	
None of the above	0%	N/A	N/A	4%	2%	
n	14	0		892	131	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.2.4 What helped you continue in your program when you were contemplating leaving?
Choose up to 3 responses.

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	(%)	(%)	Sig.	(%)	(%)	Sig.
My family encouraged/supported me	36%	N/A	N/A	40%	47%	
My friends encouraged/supported me	7%	N/A	N/A	31%	35%	
Professors/faculty encouraged/supported me	14%	N/A	N/A	29%	24%	
I had already invested too much time and resources	43%	N/A	N/A	56%	61%	
I liked the field of study	57%	N/A	N/A	50%	45%	
The job market is promising	14%	N/A	N/A	25%	19%	
Another reason	7%	N/A	N/A	11%	18%	
None of the above	14%	N/A	N/A	0%	2%	
n	14	0		891	131	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \le .05$ and Cohen's d or $h \ge .30$, (N/A) $n < 5$ or test criteria were not met

6.3 Perceptions of the Department

Table 6.3.1 Please indicate the extent to which you disagree or agree with the following statements.
(1) Strongly disagree - (5) Strongly agree

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Overall, I am satisfied with the computing program at my institution	4.42 (0.67)	N/A	N/A	4.03 (0.96)	3.85 (1.07)	
I would recommend taking computing courses at my institution to a friend	4.13 (0.73)	N/A	N/A	4.06 (0.98)	3.95 (1.02)	
The number of students in my computing classes is too large	2.33 (1.06)	N/A	N/A	3.03 (1.19)	2.75 (1.20)	
I am satisfied with the technical content of the computing courses	3.73 (1.23)	N/A	N/A	3.92 (0.96)	3.80 (1.02)	
The computing courses at my institution are too difficult	2.35 (0.91)	N/A	N/A	2.69 (1.00)	2.67 (1.00)	
n	31	2		2155	225	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.3.2 How dissatisfied or satisfied are you with the following aspects of the computing program at your institution?

(1) Very dissatisfied - (5) Very satisfied

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
The variety of computing courses offered	3.32 (1.22)	N/A	N/A	3.61 (1.14)	3.50 (1.17)	
Access to academic resources needed to do your work	4.35 (0.80)	N/A	N/A	4.02 (0.98)	3.93 (1.07)	
The availability of professors/instructors outside of class (e.g., office hours, answering questions via email, etc.)	4.52 (0.68)	N/A	N/A	4.04 (0.97)	3.85 (1.07)	
How well the program has prepared you for your future career	4.00 (0.77)	N/A	N/A	3.80 (0.98)	3.65 (1.08)	
The workload expected of you	3.90 (0.80)	N/A	N/A	3.64 (1.02)	3.44 (1.02)	
n	30	2		2154	225	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.3.3 Rate how you feel about the environment of the department of your computing program.
(1) Strongly disagree - (5) Strongly agree

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
I feel a sense of community in the computing department	3.67 (1.18)	N/A	N/A	3.65 (1.09)	3.31 (1.20)	*
People in the department often attribute my success to special treatment or luck, rather than my competence	1.87 (1.01)	N/A	N/A	2.21 (1.17)	2.25 (1.19)	
The environment in the computing department inspires me to do the best job that I can	3.70 (0.75)	N/A	N/A	3.67 (1.03)	3.41 (1.02)	
My ideas or opinions are minimized or ignored	1.87 (0.90)	N/A	N/A	2.24 (1.13)	2.35 (1.13)	
The department cares about its students	4.10 (0.80)	N/A	N/A	3.97 (1.02)	3.84 (1.04)	
The department is NOT very supportive of its students	1.87 (0.78)	N/A	N/A	2.13 (1.14)	2.20 (1.12)	
Computer science administrators (e.g., the department chair, dean, staff) and faculty care about diversity	4.00 (1.02)	N/A	N/A	3.94 (0.97)	3.57 (1.14)	*
n	30	2		2148	219	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.3.4 Do you have access to one or more academic advisor(s)?
Select all that apply

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	(%)	(%)	Sig.	(%)	(%)	Sig.
Yes, I have an academic advisor(s) affiliated with the computing department	87%	N/A	N/A	87%	88%	
Yes, I have an academic advisor(s) affiliated with another department	16%	N/A	N/A	8%	14%	
No, I do not have an advisor yet	6%	N/A	N/A	11%	8%	
n	31	2		2179	226	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.3.5 About how many times per semester/quarter do you interact with academic advisor(s) for the following reasons?
(1) Never - (5) Four or more times

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Course-related guidance	1.82 (0.82)	N/A	N/A	2.32 (0.99)	2.46 (1.03)	
Career advice	2.61 (0.92)	N/A	N/A	2.24 (1.03)	2.39 (1.13)	
Graduate school advice	2.52 (1.05)	N/A	N/A	2.48 (1.07)	2.65 (1.14)	
Another reason	3.68 (0.77)	N/A	N/A	2.51 (1.22)	2.74 (1.24)	
n	28	1		1849	198	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.3.6 How dissatisfied or satisfied are you with the following?
(1) Very dissatisfied - (5) Very satisfied

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
How often you meet with your advisor(s)	4.14 (0.97)	N/A	N/A	3.84 (1.16)	3.88 (1.20)	
The academic guidance your advisor(s) provides	4.32 (0.82)	N/A	N/A	3.89 (1.13)	3.82 (1.23)	
The career advice your advisor(s) provides	4.21 (0.79)	N/A	N/A	3.73 (1.12)	3.70 (1.22)	
n	28	1		1921	204	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

6.4 Support Structures

Table 6.4.1 Approximately how often do you interact with the following individuals?
(1) Never - (5) More than 3 times per week

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Teaching assistants	1.76 (0.91)	N/A	N/A	2.49 (1.14)	2.20 (1.16)	
An instructor/faculty member outside of lecture regarding a course	1.72 (0.92)	N/A	N/A	2.46 (1.08)	2.39 (1.12)	
An instructor/faculty member outside of lecture NOT regarding a course	2.76 (1.50)	N/A	N/A	2.27 (1.21)	2.25 (1.14)	
Classmates outside of lecture	3.83 (1.20)	N/A	N/A	3.66 (1.28)	3.50 (1.35)	
n	29	2		2128	219	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.4.2 How often to you receive the following from other students if you need it?
(1) Not at all - (5) Very much

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Help and support	3.73 (0.91)	N/A	N/A	3.68 (1.06)	3.32 (1.12)	*
Willingness to listen to issues you are having at school	3.80 (0.85)	N/A	N/A	3.64 (1.12)	3.36 (1.14)	
Feedback about your work	3.38 (1.12)	N/A	N/A	3.54 (1.12)	3.25 (1.14)	
n	29	2		2141	221	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.4.3 To what extent do you have a mentor who:
(1) Not at all - (5) Very much

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
helps you improve your computing skills	3.30 (1.15)	N/A	N/A	3.00 (1.40)	2.66 (1.47)	
shows compassion for any issues you discussed with them	3.79 (0.98)	N/A	N/A	3.42 (1.36)	3.31 (1.50)	
shares personal experiences as an alternative perspective to your problem	3.62 (1.08)	N/A	N/A	3.25 (1.37)	3.19 (1.51)	
explores career options with you	3.48 (1.09)	N/A	N/A	3.10 (1.39)	2.99 (1.49)	
encourages you to do the best you can in your coursework	3.90 (1.26)	N/A	N/A	3.28 (1.44)	3.17 (1.50)	
supports your research ideas	4.24 (1.02)	N/A	N/A	3.46 (1.40)	3.29 (1.50)	
n	29	2		2122	218	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.4.4 Think about your relationships in computing. To what extent is each of the following available to you at this point?
(1) Not at all - (5) Very much

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
People with whom you can discuss professional development questions	3.97 (0.95)	N/A	N/A	3.68 (1.02)	3.65 (1.09)	
A strong network of peers to interact with at conferences	3.35 (1.14)	N/A	N/A	3.07 (1.23)	2.86 (1.20)	
A strong network of mentors to interact with at conferences	3.13 (1.20)	N/A	N/A	2.92 (1.25)	2.65 (1.18)	
People who would be excited to learn about your professional successes	3.71 (1.07)	N/A	N/A	3.35 (1.14)	3.24 (1.14)	
People with whom you can discuss issues you are having	3.68 (1.05)	N/A	N/A	3.44 (1.11)	3.20 (1.17)	
n	31	2		2177	225	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

6.5 Self-perceptions

Table 6.5.1 Please indicate the extent to which you disagree or agree with the following statements.
(1) Strongly Disagree - (5) Strongly Agree

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
I see myself as a computing person	3.90 (0.94)	N/A	N/A	4.13 (0.91)	3.99 (1.04)	
I feel like I belong in computing	3.65 (1.08)	N/A	N/A	4.00 (0.97)	3.82 (1.08)	
I feel like an outsider in computing	2.48 (1.09)	N/A	N/A	2.18 (1.15)	2.54 (1.32)	*
Computing is a big part of who I am	3.71 (0.94)	N/A	N/A	3.78 (1.06)	3.62 (1.11)	
I feel welcomed in computing	3.84 (1.00)	N/A	N/A	3.89 (0.93)	3.63 (1.04)	
I do not have much in common with the other students in my computing classes	2.61 (1.23)	N/A	N/A	2.57 (1.13)	3.01 (1.16)	*
n	31	2		2180	228	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.5.2 In your opinion, to what extent are each of the following statements true of you?
(1) Not at all - (5) Very much

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
I can give the impression that I'm more competent than I really am	3.32 (1.11)	N/A	N/A	3.23 (1.23)	3.22 (1.31)	
When others praise me for something I have accomplished, I'm afraid I won't be able to live up to their expectations of me in the future	3.06 (1.18)	N/A	N/A	3.09 (1.27)	3.08 (1.38)	
At times, I feel my success has been due to some kind of luck	3.16 (1.42)	N/A	N/A	2.93 (1.31)	2.83 (1.45)	
I'm disappointed at times in my present accomplishments and think I should have accomplished much more by now	4.06 (1.06)	N/A	N/A	3.45 (1.28)	3.42 (1.45)	
n	31	2		2172	225	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.5.3 I am confident that I can:

(1) Strongly disagree - (5) Strongly agree

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
clearly communicate technical problems and solutions to a range of audiences	4.03 (0.71)	N/A	N/A	4.13 (0.85)	4.08 (0.82)	
articulate thoughtful answers to theoretical questions about your work during a presentation	4.06 (0.81)	N/A	N/A	4.11 (0.84)	4.08 (0.89)	
introduce myself to new peers/colleagues at professional meetings	4.00 (0.93)	N/A	N/A	4.00 (0.96)	4.07 (0.92)	
be a capable researcher in computing	3.97 (0.75)	N/A	N/A	3.87 (0.96)	3.96 (1.01)	
find employment in an area of computing interest	3.97 (0.75)	N/A	N/A	4.22 (0.81)	4.20 (0.86)	
successfully teach a course in my field	4.13 (0.76)	N/A	N/A	3.88 (1.04)	3.93 (1.07)	
be an effective mentor	3.90 (0.79)	N/A	N/A	4.02 (0.90)	4.10 (0.95)	
become an expert in my field	4.06 (0.81)	N/A	N/A	4.10 (0.87)	4.07 (0.94)	
discuss my work with senior members of my field	4.23 (0.62)	N/A	N/A	4.17 (0.82)	4.01 (0.97)	
publish in tier 1 conferences and journals in my field	4.10 (0.94)	N/A	N/A	3.66 (1.15)	3.62 (1.15)	
complete my graduate degree program	4.55 (0.68)	N/A	N/A	4.53 (0.73)	4.56 (0.71)	
n	31	2		2174	225	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.5.4 In your opinion, to what extent would a career in computing allow you to do the following.
(1) Not at all - (5) Extremely

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Serve humanity	3.45 (0.93)	N/A	N/A	3.74 (1.00)	3.95 (0.99)	
Be in a position of influence in society	3.32 (1.08)	N/A	N/A	3.67 (1.06)	3.82 (1.09)	
Spend at lot of time with family	3.13 (0.85)	N/A	N/A	3.23 (1.01)	3.39 (1.04)	
n	31	2		2191	228	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.
(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

6.6   Activities

Table 6.6.1 How often have you been involved in each of the following groups or activities?
(1) Never - (5) Four or more times

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Internships related to computing	2.39 (0.99)	N/A	N/A	2.14 (0.98)	2.17 (1.01)	
Jobs related to computing	1.56 (0.85)	N/A	N/A	1.97 (1.01)	2.04 (1.05)	
Career mentoring programs or workshops	1.61 (0.96)	N/A	N/A	1.86 (0.96)	2.03 (1.05)	
Outreach to K-12 students related to computing	1.25 (0.70)	N/A	N/A	1.57 (0.95)	1.78 (1.07)	
Computing-related student groups (e.g., technical organizations on campus, ACM student chapters, etc.)	1.75 (0.93)	N/A	N/A	1.99 (1.00)	2.02 (1.02)	
Other student groups (e.g., Greek Life, volunteer groups, academic merit societies, etc.)	1.79 (1.10)	N/A	N/A	1.90 (1.05)	1.95 (1.07)	
n	28	2		2097	217	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.
(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.6.2 How often have you been involved in each of the following groups or activities?
(1) Never - (5) Four or more times

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
Submitted a poster proposal to a conference	2.46 (1.20)	N/A	N/A	1.79 (0.99)	1.96 (1.10)	
Submitted a paper proposal to a conference	3.18 (0.94)	N/A	N/A	2.02 (1.14)	2.04 (1.12)	
Submitted a paper for publication in a peer reviewed journal	1.75 (1.08)	N/A	N/A	1.58 (0.88)	1.54 (0.85)	
Presented a poster at a conference	2.36 (1.19)	N/A	N/A	1.73 (0.95)	1.94 (1.07)	
Given an oral presentation at a conference	2.29 (1.01)	N/A	N/A	1.73 (0.95)	1.76 (0.95)	
Had a paper accepted for publication in conference proceedings	2.68 (1.16)	N/A	N/A	1.85 (1.04)	1.77 (0.98)	
Had a paper accepted for publication in a peer reviewed journal	1.50 (0.84)	N/A	N/A	1.47 (0.81)	1.43 (0.77)	
n	28	2		2106	217	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.6.3 During your academic career to date, have you participated in any of the following conferences or programs?
Select all that apply

	Your Institution			Similar Institutions		
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
ACM Richard Tapia Celebration of Diversity in Computing	0%	N/A	N/A	2%	16%	*
Grace Hopper Celebration of Women in Computing	0%	N/A	N/A	9%	14%	
CRA-WP Grad Cohort for Women	0%	N/A	N/A	7%	13%	
CRA/CRA-WP Grad Cohort for Underrepresented Minorities + Persons with Disabilities	0%	N/A	N/A	1%	18%	*
Local events related to diversity in computing	4%	N/A	N/A	11%	13%	
None of these	96%	N/A	N/A	78%	60%	*
n	25	2		2025	207	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.
(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.6.4 During your academic career to date, have you pursued any of the following resources at your institution?
Select all that apply

	Your Institution			Similar Institutions		
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
Peer tutoring	4%	N/A	N/A	18%	22%	
Tutoring offered by your department/college	12%	N/A	N/A	13%	18%	
Peer mentoring	15%	N/A	N/A	17%	18%	
Career counseling	4%	N/A	N/A	21%	23%	
Mental health counseling	35%	N/A	N/A	18%	26%	
Does not apply to me	38%	N/A	N/A	48%	42%	
n	26	2		2022	204	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.
(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

6.7 Future Plans and Interests

Table 6.7.1 For your future career, in which setting would you like to work the most?

| | Your Institution | | | Similar Institutions | | |
	AW (%)	BHN (%)	Sig.	AW (%)	BHN (%)	Sig.
Academia	74%	N/A	N/A	26%	29%	
Industry	23%	N/A	N/A	61%	48%	
Government	0%	N/A	N/A	4%	10%	
Self-employment	3%	N/A	N/A	7%	11%	
Something else	0%	N/A	N/A	2%	3%	
n	31	2		2200	228	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.
(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.7.2 How interested are you in having a career:
(1) Not at all interested - (5) Extremely interested

| | Your Institution | | | Similar Institutions | | |
	AW Mean (SD)	BHN Mean (SD)	Sig.	AW Mean (SD)	BHN Mean (SD)	Sig.
doing computing-related work	4.10 (1.04)	N/A	N/A	4.46 (0.78)	4.40 (0.83)	
in computing research	4.55 (0.77)	N/A	N/A	3.78 (1.19)	3.77 (1.24)	
n	31	2		2198	229	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.
(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.7.3 How interested are you in having the types of jobs listed below after you finish your highest degree?
(1) Very uninterested - (5) Very interested

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	Mean (SD)	Mean (SD)	Sig.	Mean (SD)	Mean (SD)	Sig.
College or university professor in computing field (teaching focused)	3.52 (1.23)	N/A	N/A	3.11 (1.31)	3.21 (1.40)	
College or university professor in computing field (research focused)	4.48 (0.93)	N/A	N/A	3.39 (1.35)	3.37 (1.40)	
K-12 computing teacher	2.00 (1.03)	N/A	N/A	2.24 (1.17)	2.17 (1.27)	
Computing researcher in industry	4.23 (0.76)	N/A	N/A	3.91 (1.15)	3.83 (1.20)	
Computing researcher in a government lab or agency	3.58 (1.18)	N/A	N/A	3.52 (1.22)	3.45 (1.29)	
A non-research computing position in industry (e.g., software engineer)	2.87 (1.12)	N/A	N/A	3.50 (1.29)	3.41 (1.33)	
A non-research computing position in government	2.29 (1.13)	N/A	N/A	2.94 (1.33)	2.82 (1.43)	
Entrepreneur (computing related; e.g., individual contractor, build a start-up)	3.00 (1.29)	N/A	N/A	3.39 (1.30)	3.28 (1.39)	
Non-computing career	1.94 (1.18)	N/A	N/A	2.07 (1.16)	2.22 (1.20)	
n	31	2		2167	227	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.7.4 What is the highest degree you plan to attain?

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	(%)	(%)	Sig.	(%)	(%)	Sig.
Associate's degree	0%	N/A	N/A	0%	0%	N/A
Bachelor's degree	0%	N/A	N/A	0%	1%	
Master's degree	3%	N/A	N/A	43%	28%	*
Doctoral degree	97%	N/A	N/A	57%	71%	
None of the above	0%	N/A	N/A	0%	0%	N/A
n	31	2		2208	231	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

Table 6.7.5 Do you intend to earn/ have your earned your highest degree in a computing-related field?

	Your Institution			Similar Institutions		
	AW	BHN		AW	BHN	
	(%)	(%)	Sig.	(%)	(%)	Sig.
No	3%	N/A	N/A	3%	6%	
Yes	97%	N/A	N/A	97%	94%	
n	31	2		2195	227	

AW: Asian (East Asian, Southeast Asian, South Asian, Other Asian) and/or White (Caucasian/European/White) students; BHN: Black(African American/African/Black), Hispanic (Hispanic/Latinx, Caribbean/Puerto Rican), Native/Indigenous (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Indigenous or First Nations), and multi-racial/ethnic students including at least one of these identities

Data are compared between AW students and BHN students at your institution, and AW students and BHN students at other institutions.

(*) $p \leq .05$ and Cohen's d or $h \geq .30$, (N/A) $n < 5$ or test criteria were not met

APPENDIX

Statistical significance

For each statistical test in this report, statistical significance is determined using a two-step process. First, we assessed whether group differences meet the conventional $p \leq .05$ threshold for inferential statistics. Then, if the $p \leq .05$ threshold was met, we observed the effect size for the two-group comparison using Cohen's d for the independent samples t tests and Cohen's h for the two-proportion z tests. According to Cohen (1988) [1], the magnitude of effect sizes indicate the following: .10 - .29 is a small effect, .30 - .49 is a medium effect, and .50 or greater is a large effect; values less than .10 are considered inconsequential. In the current report, group comparisons are only deemed "significant" if they reach the $p \leq .05$ threshold, and their effect size is $\geq .30$ (indicating an effects size of "medium" or greater).

We opted to use a two-step method to test for significant effects so that we could control for unequal sample sizes (i.e., a relatively small "Your Institution" sample, compared to a relatively large "Similar Institutions" sample). This is because large sample sizes tend to yield group differences that easily meet the $p \leq .05$ threshold, but have small effect sizes. On the other hand, it is relatively more difficult to detect a significant effect when sample sizes are small. Thus, our two-step strategy required that a group comparison meet the $p \leq .05$ threshold, and for that effect to be at least medium in size.

Statistical tests were not run if sample size was too small, $n < 5$.

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[1]Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates.