Undergraduate Research Involvement

Executive Summary

During the spring 2013 academic semester 30,744 Florida State University (FSU) undergraduates were invited to participate in a research study regarding their undergraduate experiences. The FSU Vice President of Research office provided $1000 to be used for support of this research study. FSU's Office of Undergraduate Research utilized these funds to purchase 20 Publix gift cards valued at $50.00 each to be randomly awarded to study participants as an incentive for completing the study survey.

Data were collected from the surveys via the Qualtrics survey server for four weeks beginning April 7, 2013 and closing May 3, 2013; weekly reminders were sent to undergraduates who had not yet completed the study survey. Through the use of incentives and weekly reminders, a 24.3% response rate was obtained resulting in a study sample size of 7,469 undergraduate students. The study sample appears to be a reasonable representation of the population of FSU undergraduates, though women and seniors were somewhat overrepresented.

For this report we concentrated on five main questions: 1) what proportion of FSU undergraduates are involved in research-related activities, 2) how interested are undergraduates in participating or continuing their participation in research, 3) how knowledgeable are undergraduates of research opportunities at FSU, 4) how does involvement in research relate to undergraduates' attitudes and dispositions, and 5) what are some predictors of whether undergraduates are involved in research activities. This executive summary presents an overview of research study results regarding FSU undergraduates' involvement in research.

Research Involvement

In an effort to gather relevant information pertaining to undergraduates' participation in research activities, we *narrowly* and *broadly* define research involvement. Our narrow definition of research involvement was whether undergraduates *worked with a mentor or faculty supervisor on research-related activities;* our broad definition of research involvement was whether undergraduates were involved in *any research-related, creative, and/or senior-level projects*. Both definitions are useful for the assessment of undergraduate research experiences gained not only through guidance received from research mentorship but also through research-relevant efforts employed in creative and senior-level projects.

Narrowly defined, we estimate that ***17.5%*** of undergraduates at FSU are involved in research-related activities through their work with research mentors and/or faculty supervisors on research projects; broadly defined we estimate that ***23.3%*** are involved in some type of research,

creative, or senior-level projects. Whether research involvement was narrowly or broadly defined there are no differences in involvement in research-related activities at FSU by gender. Undergraduates in the College of Arts and Sciences are most involved in research; undergraduates in the colleges of Business, Education, and Undergraduate Studies are least involved in research. Asian/Pacific Islander students, seniors, Physical and Life sciences majors, and are most involved in research; Black/African American students, freshmen, Business an Education majors are least involved in research.

Researchers versus Non-Researchers

For analyses comparing *researchers* and *non-researchers*, only undergraduates that could be *both* narrowly and broadly classified as researchers were assessed as the "researcher group". This group consists of undergraduates that indicated that they were involved in research, creative or senior projects *and* worked with a mentor or faculty supervisor on research activities. Undergraduates that had *not* been involved in research, creative or senior projects and *never* worked with a mentor or faculty supervisor on research activities were classified as the "non-researcher group". In this subsample, there were 966 undergraduates classified as researchers and 5,383 undergraduates classified as non-researchers to be used for comparisons. On average researchers have higher cumulative college GPAs, high school GPAs, SAT and ACT scores, more total degree hours, and higher FAFSA-reported annual family incomes than non-researchers.

As expected, researchers have moderate to high ratings on all researcher role-identity salience items. In particular, researchers have much higher ratings than non-researchers for how they perceived their involvement in research as being important to how others viewed them, and the extent to which they actually thought about doing research. They also have higher ratings on all instructor support items used in this study. In particular, researchers have much higher ratings for how often they were provided with encouragement to pursue graduate and/or professional study, a letter of recommendation, and an opportunity to work on a research project.

Moreover, researchers have higher ratings on many general undergraduate attitudinal items. They feel more connected to their academic field, more interested in attending graduate school, more inclined to want to become a professor, more critical of other people's claims, and more often explore different ways of thinking about topics or issues than non-researchers. In addition researchers have higher ratings on all research-related disposition items used in this

study than non-researchers. In particular, researchers have much higher ratings for how encouraged they feel by their program to engage in research, how important they feel participating in research is, whether they feel that they have the time to engage in research, and most notably, on the extent to which they feel that they understand how to get involved in research.

Notable Predictors

The *extent to which undergraduates feel that they understand how to get involved in research* is the strongest predictor of whether they are involved in research both broadly and narrowly defined. This is also the strongest predictor of how much undergraduates perceive to know about research opportunities at FSU. Additionally, we found strong predictors of undergraduates' interest in participating or continuing their participation in research activities. The extent that *non-researchers* feel that participating in undergraduate research is important is the strongest predictor of their interest in participating in research-related activities. The extent that *researchers* actually think about doing research is the strongest predictor of their interest in continuing their participation in research-related activities.

Interest in Participating in Research

In general, *non-researchers* perceive to have *some knowledge* (33.7%) or *little knowledge* (46.4%) of the undergraduate research opportunities available to them at FSU, yet their interest in participating in research varies by gender and among race/ethnicity, academic classification, FSU academic college, and academic field groupings. Men are slightly more interested in participating in research than women. Asian/Pacific Islander and Hispanic/Latino students are most interested in participating research. Sophomores are most interested in participating in research, followed closely by freshmen and juniors; seniors are least interested. Undergraduates in the colleges of Engineering, Arts and Sciences, and Undergraduates Studies are most interested; those from the colleges of Education, Music and Business are least interested. Undergraduates majoring in Physical, Life and Engineering are most interested; Business, Education, and Arts majors are least interested.

Undergraduates that *have* been involved in research-related activities (i.e., researchers) are *very interested* (47.8%) or *moderately interested* (23.0%) in continuing their participation in research activities and programs. Among this cohort, interest in continuing their participation in research varies by academic field and academic classification (i.e., freshmen, sophomores,

juniors, and seniors). Physical, Life, Engineering, and Computational sciences majors (i.e., traditional STEM) are most interested in continuing their participation in research. Juniors and sophomores are more interested in continuing their participation in research than freshmen and seniors. By senior year, undergraduates that have not participated in research are markedly less interested in doing so.

Conclusion

We can estimate that between 17.5% to 23.3% of undergraduates at FSU are involved in research-related activities. Among seniors we estimate that 24.5% have worked with a mentor or faculty supervisor on a research-related project. This figure corresponds with findings from the 2013 National Survey of Student Engagement (NSSE) that proposed that 23% of seniors at degree-granting U.S. postsecondary institutions have worked with a mentor on research.

On average undergraduates that *have* been involved in research-related activities indicate more favorable ratings regarding general and research-related attitudes, researcher identification, and instructor support, and higher scores on measures related to undergraduate success (i.e., GPA, ACT and SAT scores) than those that have not been involved in research. Understanding how to get involved in research and perceived knowledge of research opportunities were strong predictors of participation in undergraduate research-related activities.

In general, undergraduates that *have not* participated in research-related activities are moderately to somewhat interested in participating but have only little to some knowledge of the research opportunities available to them at FSU. Results from this study suggest that increasing undergraduates' awareness of research opportunities at FSU as well as their understanding of how to get involved in research, especially among underclassmen, should increase undergraduates' involvement in research-related activities and programs. Through support and encouragement from instructors and the university, undergraduates can become more knowledgeable of the value attributed to involvement in research, and more likely to participate in research-related activities and programs.

Undergraduate Research Report

Analyses and report completed by Brandon J. O. Nzekwe
Educational Research Coordinator for The National High Magnetic Field Laboratory's Center
for Integrating Research and Learning and funded in part by the National Science Foundation Division of Materials Research, DMR 0654118 and by the National Science Foundation DRK-12 (formerly Teacher Professional Continuum Program) Award #ESI-0553769.

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ABSTRACT

The Office of Undergraduate Research's survey of research involvement among undergraduates at Florida State University obtained responses from nearly one fourth of the undergraduates enrolled at FSU during the spring 2013 semester. This survey instrument gathered a variety of data regarding undergraduates' involvement in research activities, interest in participating in research, perceived knowledge about research opportunities, researcher role-identification, and attitudes regarding their undergraduate experiences.

We narrowly and broadly define research involvement. Narrowly defined 17.5% of undergraduates worked with a mentor or faculty supervisor on research-related activities; broadly defined 23.3% of undergraduates participated in undergraduate research-related activities and programs, creative projects, and/or senior level projects. Whether narrowly or broadly defined there are no significant gender differences in research involvement. Asian/Pacific Islanders, seniors, and Physical and Life sciences majors are most involved in research; Black/ African American students, freshmen, Business, and Education majors are least involved.

The extent that undergraduates understand how to get involved in research is the strongest predictor of whether they participate in research-related activities, and how much they perceive to know about research activities at FSU. Asian/Pacific Islander and Hispanic/Latino students are most knowledgeable of research opportunities and most interested in participating in research activities. Undergraduates majoring in Physical or Life sciences fields perceived to know the most about research activities at FSU, are most interested in participating or continuing their participation in research activities, and most likely to work with a mentor or faculty supervisor on research activities. Sophomores are most interested in getting involved in research-related activities; seniors are the least interested.

On average undergraduates with involvement in research-related activities have higher SAT and ACT scores, cumulative college and high school GPAs, more degree hours, and greater family incomes than those that do not participate in research. They also feel more support and encouragement from their academic department or program than undergraduates that are not involved in research.

INTRODUCTION

During the spring 2013 academic semester 30,744 Florida State University (FSU) undergraduates were invited to participate in a research study regarding their undergraduate experiences. Under the auspices of FSU's Office of Undergraduate Research, e-mails were sent to students' university e-mail addresses requesting their participation. After receiving this e-mail, consenting students were re-directed to an online survey. This survey gathered student demographic information and assessed their attitudes regarding a researcher identity, their dispositions toward research, and their involvement in research-related activities. Data were collected from the surveys over four weeks beginning April 7, 2013 and closing May 3, 2013 with weekly reminders sent to undergraduates who had not yet completed the survey.

The FSU Vice President of Research office provided $1000 in funds to be used for support of this research study. FSU's Office of Undergraduate Research utilized these funds to purchase 20 Publix gift cards valued at $50 each to be offered as an incentive to participants for completing the survey. Participants were informed that by completing the study survey they would be entered into a random drawing for which 20 participants would be awarded one of the purchased gift cards. Through the use of incentives and weekly reminders, a 24.3% response rate was obtained resulting in a sample size of 7,469 undergraduate students. This report presents the results from this research study in the form of descriptive, comparative, and predictive statistics regarding FSU undergraduate involvement in research.

SECTION 1: COMPARATIVE DEMOGRAPHICS

Our sample appears to be representative of the overall population of FSU undergraduates[1] with the exception of greater percentages of women ($t_{(7,468)}$=23.87, p<0.001) and seniors ($t_{(7,468)}$=11.13, p<0.001) when compared to their representation in the population of FSU undergraduates. The overrepresentation of seniors consequently resulted in lower percentages of freshmen ($t_{(7,468)}$=10.06, p<0.001), sophomores ($t_{(7,468)}$=4.44, p<0.001) and juniors ($t_{(7,468)}$=2.70, p=0.007). There were no significant differences in the distribution of race/ethnicity between the study sample of undergraduates and the FSU undergraduate population. Table 1 details comparative demographic information between the FSU undergraduate population and study participants according to gender, race/ethnicity, and academic classification.

Table 1

Comparison of study sample and population by gender, race/ethnicity, and academic classification

		Undergraduate population		Study participants	
Categories		*N* = 30,744	%	*n* = 7,469	%
Gender	Women	16,952	55.1%	5,071	67.9%
	Men	13,792	44.9	2,398	32.1
Race/ Ethnicity	Asian/Pacific Islander	1,138	3.7%	297	4.0%
	Black/African American	3,074	10.0	762	10.2
	Hispanic/Latino	4,946	16.1	1,157	15.5
	Native American	341	1.1	82	1.1
	White/Caucasian	20,818	67.7	5,077	68.0
	Other/Unspecified	427	1.4	94	1.3
Academic Classification	Freshman	3,216	10.5%	556	7.4%
	Sophomore	6,293	20.5	1,382	18.5
	Junior	8,960	29.1	2,069	27.7
	Senior	12,260	39.9	3,460	46.3

[1] One sample *t*-tests (2-tailed) were used to compare the sample percentages with the actual population percentages

Figure 1.1 displays the gender distributions of the FSU population compared to the study sample of undergraduate students.

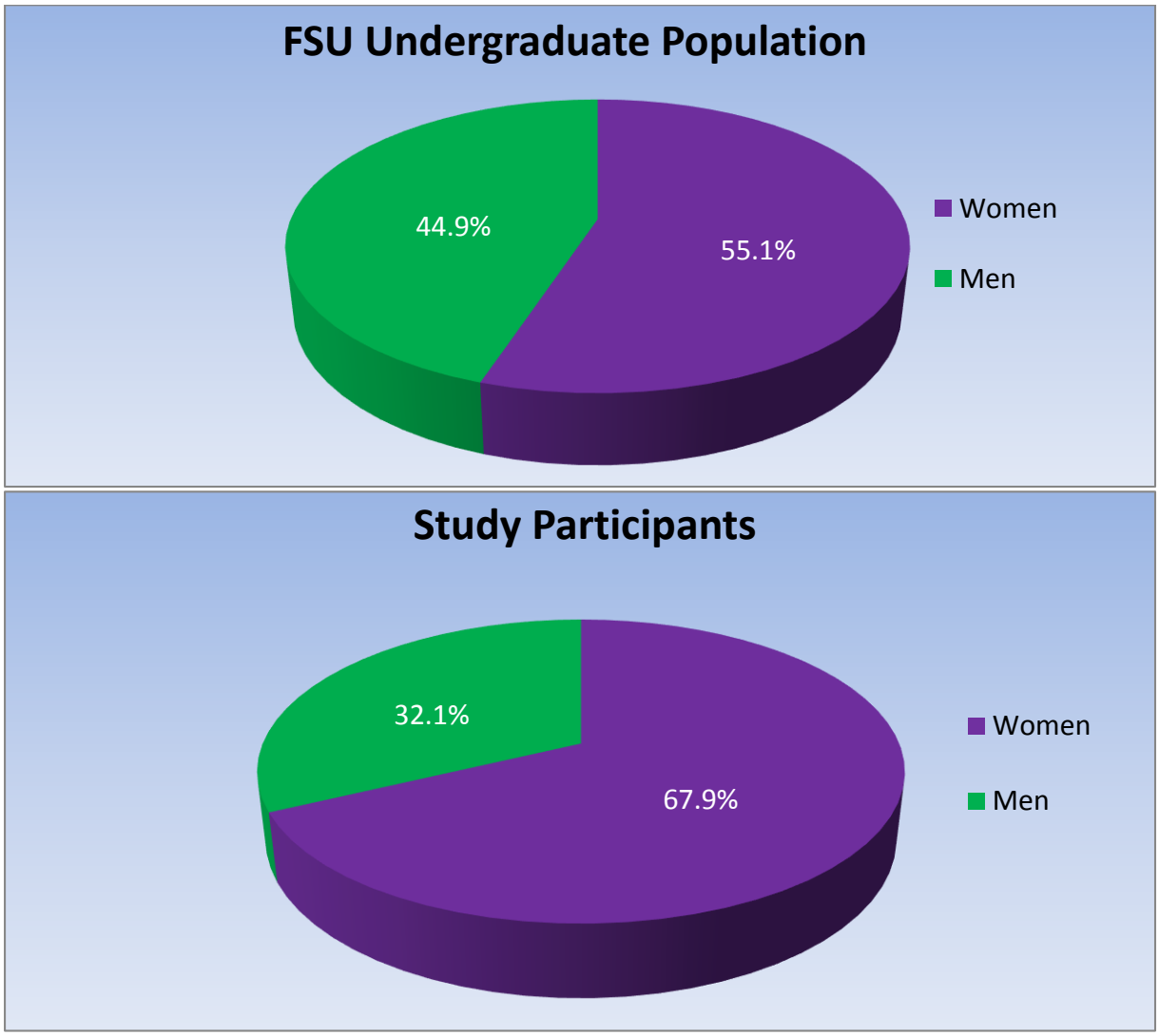


Figure 1.1. Gender distributions of FSU population compared to study participants. Greater percentages of women in the sample $t_{(7,468)}$=23.68, p<0.001 (2-tailed) than the population

Figure 1.2 displays the race/ethnicity distributions of the FSU population compared to the study sample of undergraduate students. Figure 1.3 displays the academic classification distributions (i.e., freshmen, sophomores, juniors and seniors) of the FSU population compared to the study sample of undergraduate students.

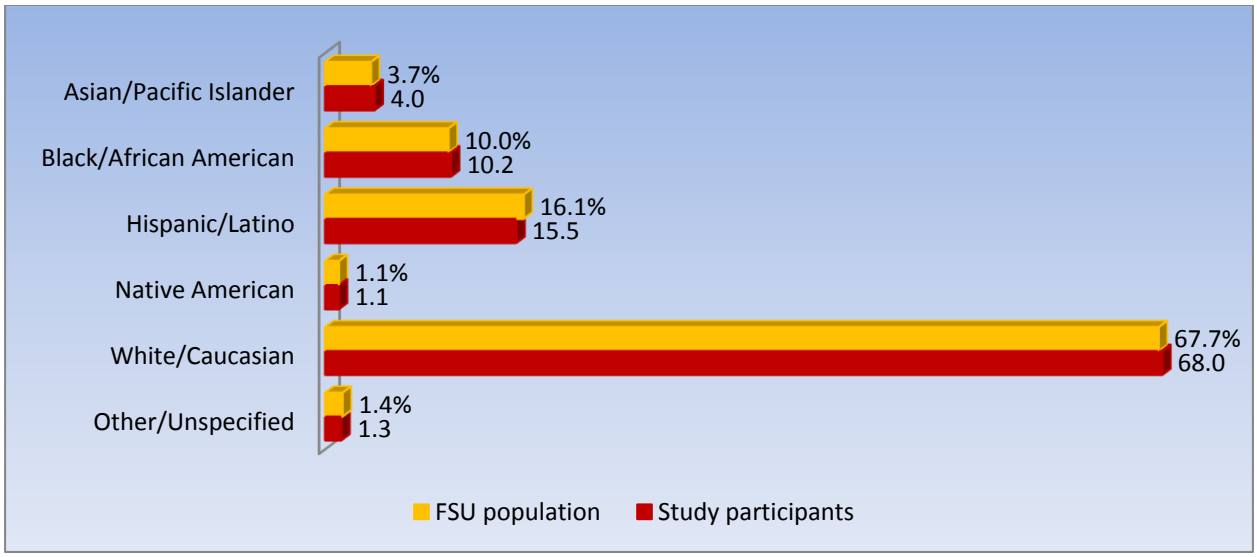


Figure 1.2. Race/Ethnicity categories of FSU population compared to study participants

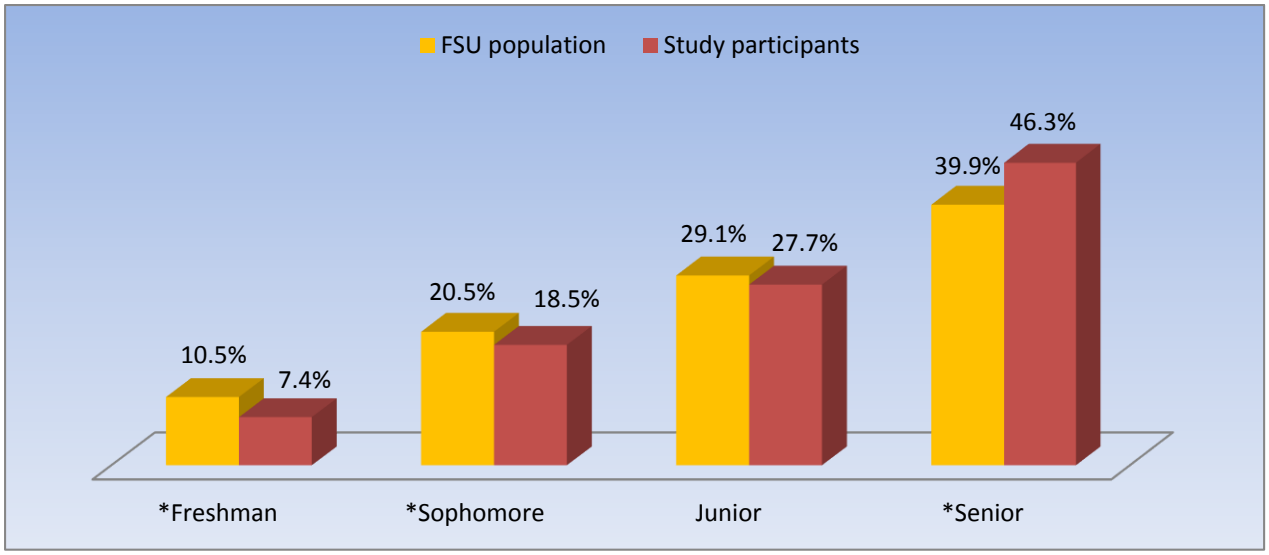


Figure 1.3. Academic classifications of FSU population compared to study participants. Significant differences between the sample and the population percentages at the 0.001 α-level indicated by *

There were greater percentages of undergraduates in our sample from the colleges of Arts and Sciences ($t_{(7,468)}$=6.94, p<0.001) and Education ($t_{(7,468)}$=3.468, p<0.001); study participants were less represented from the colleges of Motion Picture Arts ($t_{(7,468)}$=3.47, p<0.001) and Undergraduate Studies ($t_{(7,468)}$=10.46, p<0.001) when compared to the FSU population of undergraduate students. Table 2 shows comparative demographic information of the FSU undergraduate population and study participants according to FSU academic college classifications.

Table 2

Undergraduate population comparison with study sample of undergraduates by FSU academic college

		FSU population		Study participants	
Categories		*N* = 30,744	%	*n* = 7,469	%
FSU Academic College	College of Applied Studies	152	0.5%	32	0.4%
	College of Arts and Sciences	6,478	21.1	1,834	24.6
	College of Business	3,530	11.5	804	10.8
	College of Communications and Information	1,450	4.7	404	5.4
	College of Criminology and Criminal Justice	1,325	4.3	302	4.0
	College of Education	752	2.4	231	3.1
	College of Engineering	1,222	4.0	287	3.8
	College of Human Sciences	2,006	6.5	553	7.4
	College of Motion Picture Arts	134	0.4	16	0.2
	College of Music	709	2.3	164	2.2
	College of Nursing	311	1.0	88	1.2
	College of Social Science and Public Policy	3,409	11.1	852	11.4
	College of Social Work	271	0.9	89	1.2
	College of Visual Arts, Theatre, and Dance	894	2.9	217	2.9
	Undergraduate Studies	8,086	26.3	1,594	21.3

Figure 1.4 displays the FSU academic college distributions of the FSU population compared to the study sample of undergraduates.

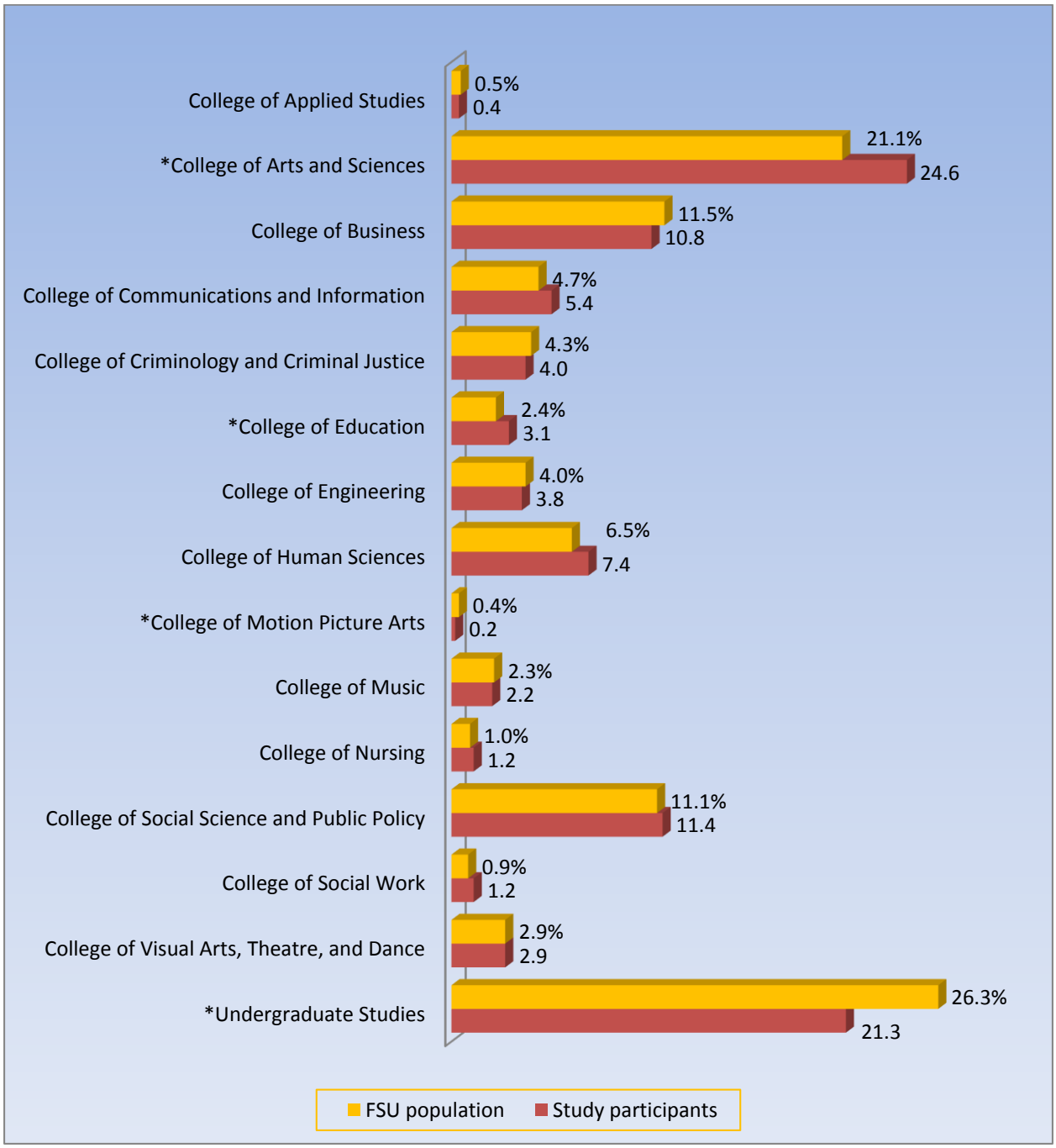


Figure 1.4. Academic classifications of undergraduate population compared to study participants. * indicates significant differences between the sample and the population at the 0.001 α-level

The academic fields of undergraduates majoring in science, technology, engineering, and mathematics (STEM) disciplines were categorized according to the National Science Foundation's Science and Engineering Indicators (National Science Board, 2012) as Physical Sciences, Life Sciences, Engineering, Computational Sciences, Social and Behavioral Sciences, and Allied Health Sciences. Table 3 list STEM disciplines by academic field and distinguishes between traditional and non-traditional STEM disciplines.

Table 3

Undergraduate STEM disciplines classified by academic field

Traditional STEM disciplines				***Non-Traditional STEM disciplines***	
Physical Sciences	**Life Sciences**	**Engineering**	**Computational Sciences**	**Social and Behavioral Sciences**	**Allied Health Sciences**
Biochemistry	Biology	Chemical	Actuarial Science	Anthropology	Athletic training
Chemical Science	Biological Science	Civil	Biomathematics	Communication Sciences	Dietetics
Chemistry		Computer	Computer Science	Criminology	Exercise Science
Environmental Science		Electrical	Mathematics	Economics	Food & Nutrition Science
Geology		Environmental	Statistics	Environmental Studies	Nursing
Meteorology		Industrial		Family & Child Sciences	
Physics/ Astrophysics		Mechanical		Geography	
				Information Studies	
				International Affairs	
				Political Science	
				Psychology	
				Sociology	
				Environmental Studies	

The academic fields of undergraduates major in non-STEM disciplines were categorized as Business, Humanities, Arts, Education, and Undecided/Undeclared. Table 4 list non-STEM disciplines by academic field.

Table 4

Undergraduate non-STEM disciplines classified by academic field

Business	**Humanities**	**Arts**	**Education**	**Undecided/Undeclared**
Accounting	Classics	Art history	Early Childhood	Exploratory I & II
Advertising	Editing, Writing & Media	Creative Writing	Elementary	
Finance	English	Dance	English Education	
Hospitality Management	Foreign Languages	Interior Design	Exceptional Student Education	
Management	History	Motion Picture Arts & Production	Social Science Education	
Marketing	General Humanities	Music	Sport Management	
Merchandising	Literature	Studio Art	Visual Disabilities Education	
Professional Golf Management	Philosophy	Theatre		
Real Estate	Religion			
Recreation, Tourism, & Events				

There were greater percentages of study participants majoring in Social and Behavioral sciences ($t_{(7,468)}$=4.04, p<0.001) and Life sciences fields ($t_{(7,468)}$=2.12, p=0.034), and lower percentages majoring in Business ($t_{(7,468)}$=5.76, p<0.001) and Education fields ($t_{(7,468)}$=2.38,

p=0.017) when compared to the FSU undergraduate population. Undergraduates categorized as Undecided/Undeclared majors ($t_{(7,468)}$=6.52, p<0.001) were less represented in the study sample when compared to the population as well. Table 5 presents comparative demographic information for FSU undergraduates and study participants according to academic field groupings. Figure 1.5 displays the academic field classifications of the FSU population compared to study participants. In general, there were greater percentages of study participants in non-traditional STEM fields ($t_{(7,468)}$=4.16, p<0.001) and lower percentages in non-STEM fields ($t_{(7,468)}$=5.09, p<0.001) in the sample than expected. Figure 1.6 displays the FSU undergraduate population compared to the study sample of undergraduates by traditional STEM, non-traditional STEM, and non-STEM field groupings.

Table 5

Undergraduate population comparison with study sample of undergraduates by academic field

	FSU population		Study participants	
Academic Field	*N* = 30,744	%	*n* = 7,469	%
Physical Sciences	956	3.1%	262	3.5%
Life Sciences	1,948	6.3	517	6.9
Engineering	1,704	5.5	376	5.0
Computational Sciences	1,011	3.3	246	3.3
Social and Behavioral Sciences	10,700	34.8	2,768	37.1
Allied Health Sciences	2,116	6.9	525	7.0
Business	5,769	18.8	1,220	16.3
Humanities	2,583	8.4	659	8.8
Arts	1,968	6.4	450	6.0
Education	1,039	3.4	294	3.9
Undecided/Undeclared	950	3.1	152	2.0

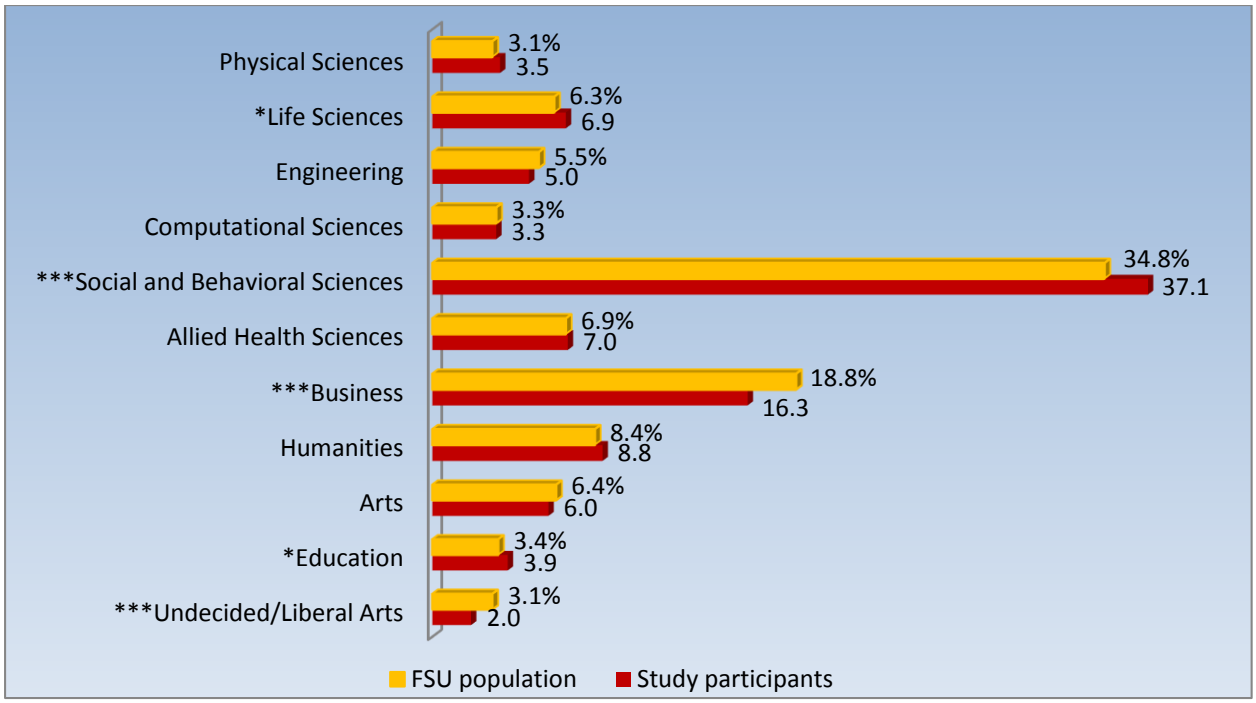


Figure 1.5. Academic field classifications of undergraduate population compared to study sample. * indicates significant differences at the 0.05 α-level; *** indicates significant differences at the 0.001 α-level

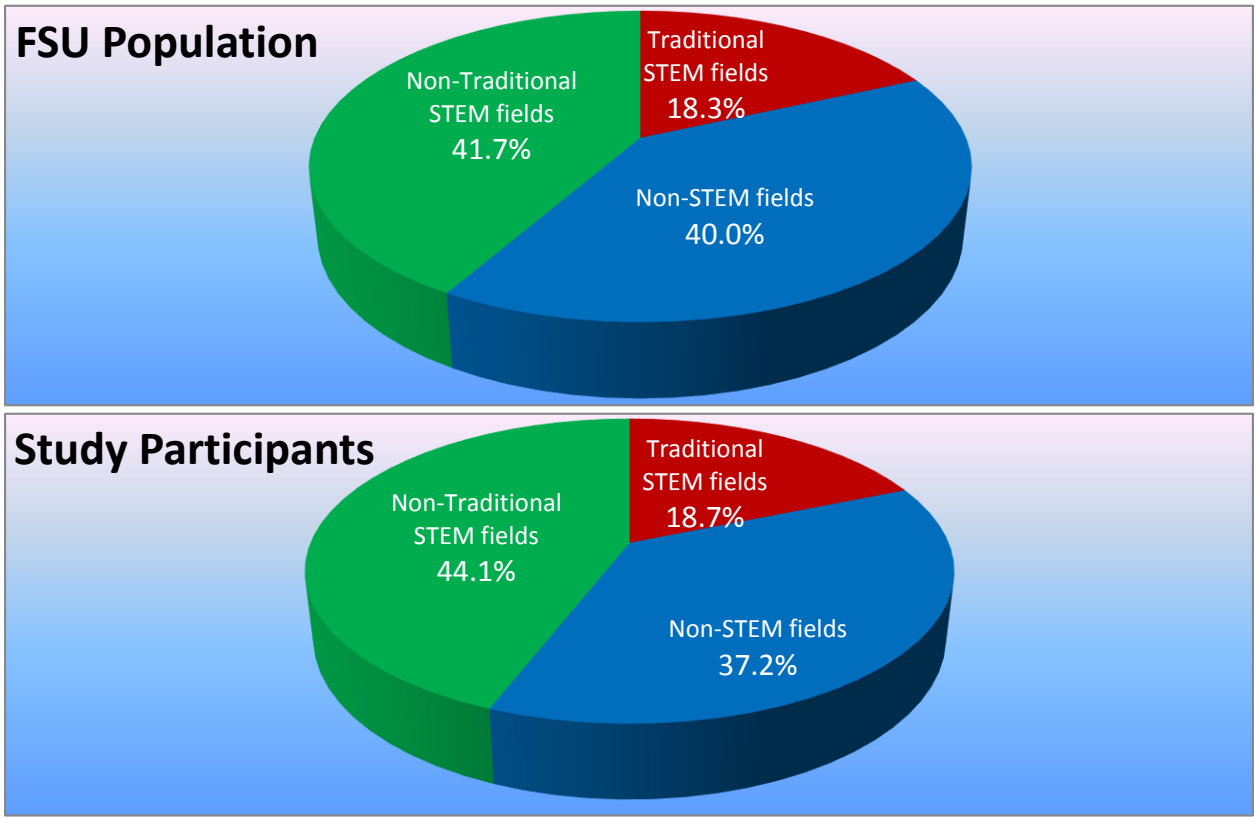


Figure 1.6. STEM and non-STEM groupings of undergraduate population compared to study sample.

SECTION 2: STUDY PARTICIPANTS SURVEY ITEM RESPONSES

Participants of this study were asked a variety of questions pertaining to their undergraduate experiences, academic aspirations, and research-related attitudes and involvement. The following section will present responses to survey items regarding study participants' anticipated degrees and organizational involvement, perceived knowledge of research opportunities at FSU, involvement in undergraduate research activities, and interest in participating in research activities.

Anticipated Degrees and Organizational Involvement

Study participants were asked to indicate the advanced degree(s) that they wanted to pursue. The majority of participants indicated that they were considering pursuing at least a Master's degree (54.9%). Table 6 present results from this survey item.

Table 6

Anticipated advanced degrees of study participants

Advanced degree	Frequency (*f*)	Percentage (%)
Master's degree	4,042	54.9%
Not sure yet	1,770	24.0
Ph.D, Ed.D, or PsyD	1,252	17.0
None	704	9.6
Law degree	646	8.8
Medical degree	586	8.0
Specialist degree	418	5.7
Professional doctorate (e.g., PharmD, DDS, DVM)	111	1.5

Note. n = 7,362

Study participants were asked to indicate the academic, professional, and social organizations that they participated in as an undergraduate. The vast majority (75.5%) of participants indicated that they participated in at least one academic club or student organization. Table 7 details the results from this survey item.

Table 7

Study participants' academic, professional, and social organizations

Categories	Frequency (*f*)	Percentage (%)
Academic Clubs or Student Organizations	4,270	75.5%
Internship	1,762	31.1
Fraternity or Sorority	1,557	27.5
FSU Honors Program	1,201	21.1
International Study/Volunteer Abroad	832	14.7
CARE	307	5.4
Service Learning Course	295	5.2
Student Government Association	250	4.4

Note. *n*= 5,659

Perceived Knowledge of Research Activities at Florida State University

Study participants were asked *how much they felt that they knew about undergraduate research activities at Florida State University*. The majority of participants (79.8%) indicated that they had either little knowledge (40.9%) or some knowledge (38.9%) of undergraduate activities/programs at FSU. Figure 2.1 displays the student responses to this survey item.

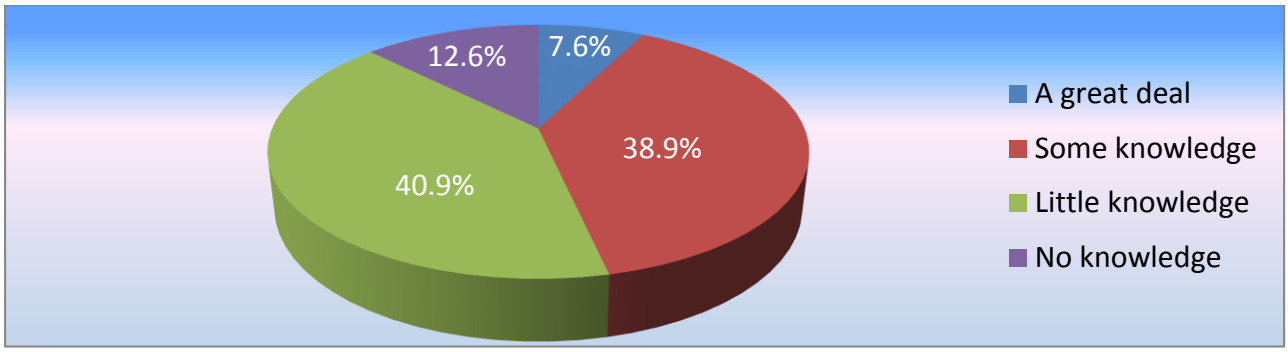


Figure 2.1. Study participants' perceived knowledge of undergraduate research activities at FSU

Further analysis of undergraduates' *perceived knowledge* of research activities at FSU was conducted. Perceived knowledge of research activities at FSU did not vary significantly by gender ($F_{(1, 7359)} = 0.74$, $p = 0.39$), but did significantly vary among race/ethnicity ($F_{(5, 7360)} = 3.28$, $p = 0.01$), academic classification ($F_{(3, 7358)} = 29.13$, $p < 0.001$), FSU academic college ($F_{(14, 7358)} = 11.97$, $p < 0.001$) and academic field ($F_{(10, 7360)} = 13.47$, $p < 0.001$) groupings.

Asian/Pacific Islander students perceived to know significantly more about research activities at FSU ($\alpha = 0.01$) than all other race/ethnicity groups; Hispanics/Latinos more ($\alpha = 0.05$) than White/Caucasian students. Seniors perceived to know significantly more about research activities at FSU ($\alpha = 0.001$) than juniors, sophomores and freshmen. Students in the College of Arts and Sciences perceived to know significantly more about research activities at FSU ($\alpha = 0.05$) than all other FSU academic colleges. Physical and Life sciences majors perceived to know significantly more about research activities at FSU ($\alpha = 0.001$) than all other academic fields; Social and Behavioral sciences majors more than Business majors ($\alpha = 0.001$), more than Arts and Education majors ($\alpha = 0.01$), and more than Computational Sciences majors ($\alpha = 0.05$). Tables 8 details study participants' ratings of perceived knowledge of research activities at FSU by gender, race/ethnicity, academic classification, FSU academic college, and academic field with *F*-values and *p*-values.

Table 8

Perceived knowledge of research activities ratings by gender, race/ethnicity, academic class, college, and field

Categories		*n*	Perceived knowledge rating	*F*-value	*p*-value
Gender	Women	4,999	2.42	0.74	0.39
	Men	2,362	2.40		
Race/ Ethnicity	Asian/Pacific Islander	290	2.57	3.28	0.006
	Hispanic/Latino	1,138	2.46		
	Black/African American	745	2.41		
	White/Caucasian	5,013	2.40		
	Native American	82	2.37		
	Other/Not specified	93	2.35		
Academic Class	Senior	3,418	2.51	29.13	<0.001
	Sophomore	1,363	2.35		
	Junior	2,036	2.33		
	Freshman	542	2.31		
FSU Academic College	College of Arts and Sciences	1,801	2.60	11.97	<0.001
	College of Human Sciences	543	2.48		
	College of Communications and Information	403	2.44		
	College of Nursing	87	2.43		
	College of Engineering	284	2.41		
	College of Social Work	87	2.4		
	College of Visual Arts, Theatre, and Dance	213	2.37		
	College of Social Science and Public Policy	842	2.35		
	Undergraduate Studies	1,565	2.33		
	College of Criminology and Criminal Justice	302	2.33		
	College of Music	161	2.32		
	College of Business	793	2.29		
	College of Education	230	2.23		
	College of Applied Studies	32	2.19		
	College of Motion Picture Arts	16	2.13		
Academic Field	Life Sciences	508	2.68	6.38	<0.001
	Physical Sciences	260	2.66		
	Social and Behavioral Sciences	2,741	2.45		
	Allied Health Sciences	514	2.43		
	Humanities	641	2.39		
	Engineering	370	2.38		
	Computational Sciences	241	2.33		
	Arts	443	2.33		
	Education	293	2.29		
	Business	1,200	2.29		
	Undecided/Undeclared	150	2.28		

Note. One-way ANOVAs; 4pt scale (4=A great deal; 3=Some knowledge; 2=Little knowledge; 1=No knowledge)

Study participants were also asked whether they visited FSU's Office of Undergraduate Research (OUR) or attended one of their information sessions; 18.2% indicated that they visited the OUR or attended one of their information sessions. Perceived knowledge of research activities at FSU had a moderate positive correlation ($r = 0.35$, $p < 0.001$) with whether study participants visited the Office of Undergraduate Research. The percentage of study participants that visited the OUR or attended one of their information sessions significantly varied by gender ($F_{(1, 7367)} = 5.12$, $p = 0.02$), and among race/ethnicity ($F_{(5, 7363)} = 3.61$, $p < 0.001$), academic classification ($F_{(3, 7363)} = 10.228$, $p < 0.001$), FSU academic college ($F_{(14, 7366)} = 4.75$, $p < 0.001$) and academic field ($F_{(10, 7368)} = 6.38$, $p < 0.001$) groupings.

Significantly greater percentages of men visited the OUR or attended one of their information sessions ($\alpha = 0.05$) than women. Significantly larger percentages of Asian/Pacific Islander and Hispanic/Latino students visited the OUR ($\alpha = 0.05$) than White/Caucasian and Native American students. Significantly higher percentages of seniors visited the OUR or attended one of their sessions ($\alpha = 0.001$) than freshmen and juniors; more sophomores than freshmen ($\alpha = 0.01$) and juniors ($\alpha = 0.05$). The colleges of Arts and Sciences and Visual Arts, Theatre and Dance had the largest percentages of students that visited the OUR or attended one of their sessions; the colleges of Education and Criminology and Criminal Justices had the smallest percentages. A significantly greater representation of Life and Physical sciences majors visited the OUR or attended one of their sessions ($\alpha = 0.05$) than all other academic fields except for students classified as Undecided/Undeclared. Table 9 details study participants that visited FSU's Office of Undergraduate Research or attended one of their information sessions by gender, race/ethnicity, academic classification, FSU academic college, and academic field groupings with *F*-values and *p*-values.

Table 9

Participants that visited the OUR or attended sessions by gender, race/ethnicity, academic class, college, and field

Categories		*n*	Visited the OUR or attended info session	*F*-value	*p*-value
Gender	Men	2,363	19.6%	5.12	0.02
	Women	5,006	17.5		
Race/ Ethnicity	Asian/Pacific Islander	292	24.3%	3.61	<0.001
	Other/Not specified	93	21.5		
	Hispanic/Latino	1,138	20.5		
	Black/African American	746	19.6		
	White/Caucasian	5,018	17.1		
	Native American	82	14.6		
Academic Class	Senior	3,420	20.3%	10.23	<0.001
	Sophomore	1,366	18.5		
	Junior	2,038	15.8		
	Freshman	543	12.3		
Academic Field	College of Arts and Sciences	1,804	23.2%	4.75	<0.001
	College of Visual Arts, Theatre, and Dance	213	23.0		
	College of Social Science and Public Policy	842	19.7		
	College of Motion Picture Arts	16	18.7		
	Undergraduate Studies	1,569	17.0		
	College of Human Sciences	544	16.9		
	College of Engineering	284	16.5		
	College of Nursing	87	16.1		
	College of Communications and Information	403	15.9		
	College of Music	161	15.5		
	College of Business	793	15.3		
	College of Criminology and Criminal Justice	302	11.6		
	College of Social Work	87	11.5		
	College of Education	230	10.9		
	College of Applied Studies	32	9.4		
	Life Sciences	510	28.4%		
	Physical Sciences	261	24.9		
	Undecided/Undeclared	150	20.0		
	Humanities	641	18.3		
	Arts	443	18.3		
	Allied Health Sciences	515	17.9		
	Social and Behavioral Sciences	2,745	17.7		
	Engineering	370	17.6		
	Computational Sciences	241	17.0		
	Business	1,200	15.5		
	Education	293	10.2		

Note. One-way ANOVAs

Involvement in Undergraduate Research Activities

In order to gather information regarding undergraduate involvement in research-related activities, we included two items used to assess research involvement. The first item asked whether study participants participated in *any research-related, creative or senior-level projects* and will be used to *broadly* defined research involvement. This item was useful for the inclusion of participants with undergraduate research efforts displayed primarily through creative and/or senior-level projects.

Undergraduate research involvement is commonly defined as research experiences gained under the guidance of research mentors and faculty supervisors (ACS, 2002; Kuh, 2008). This narrowly defined conceptualization of research involvement highlights the interaction between an experienced researcher and a research novice as being crucial to the development of research-relevant knowledge and skills. Keeping to this notion, the second item that we used to assess research involvement asked whether participants *worked with a mentor or faculty supervisor on research related activities.* This item will be used to *narrowly* defined research involvement.

The item responses to whether study participants were involved in research, creative or senior projects (i.e., broadly defined) had a high positive correlation ($r = 0.56$, $p = 0.00$) with responses to whether the participants worked with a mentor or faculty supervisor on research activities (i.e., narrowly defined). Table 10 details the percentage of study participants involved in research-related activities both broadly and narrowly defined according to gender, race/ethnicity, academic classification, FSU academic college, and academic field.

Table 10

Research involvement by gender, race/ethnicity, academic class, college, and field

Categories		*n*	*Broadly defined* involvement in any research, creative or senior projects Percentage (%)	*Narrowly defined* worked with mentor/faculty on research activities Percentage (%)
Gender	Women	5,071	23.4%	17.2%
	Men	2,398	23.3	18.0
Race/ Ethnicity	Asian/ Pacific Islander	297	28.8%	27.4%
	Black/African American	762	20.6	14.2
	Hispanic/Latino	1,157	22.0	17.2
	Native American	82	23.2	15.9
	White/ Caucasian	5,077	23.8	17.5
	Other/Unspecified	94	20.4	15.1
Academic Classification	Freshman	556	10.5%	7.9%
	Sophomore	1,382	13.4	10.5
	Junior	2,069	16.9	12.9
	Senior	3,460	33.2	24.5
FSU Academic College	College of Applied Studies	32	12.5%	9.4%
	College of Arts and Sciences	1,804	35.3	31.6
	College of Business	793	11.3	7.2
	College of Communications and Information	403	31.3	17.1
	College of Criminology and Criminal Justice	302	18.9	12.6
	College of Education	230	15.2	6.1
	College of Engineering	284	38.4	21.1
	College of Human Sciences	544	23.7	19.7
	College of Motion Picture Arts	16	12.5	0.0
	College of Music	161	37.9	8.0
	College of Nursing	87	20.7	12.6
	College of Social Science and Public Policy	842	21.4	13.8
	College of Social Work	87	27.6	16.1
	College of Visual Arts, Theatre, and Dance	213	30.5	23.5
	Undergraduate Studies	1,571	11.7	9.5
Academic Field	Physical Sciences	261	38.7%	39.8%
	Life Sciences	510	31.8	34.3
	Engineering	370	31.6	18.9
	Computational Sciences	241	16.6	11.6
	Social and Behavioral Sciences	2,745	26.4	18.5
	Allied Health Sciences	515	19.6	17.7
	Business	1,200	11.3	7.1
	Humanities	641	22.3	17.2
	Arts	443	29.8	19.0
	Education	293	15.0	5.8
	Undecided/Undeclared	150	13.3	10.7

Research broadly defined: Involved in research, creative or senior projects

We found that 23.3% of study participants indicated that they participated in research-related activities/programs, creative projects, and/or senior-level projects. There were no significant gender differences in the percentage of participants involved in research according to our broad definition of research involvement. Participation in research, creative or senior projects *did not* vary significantly among race/ethnicity groupings ($F_{(5, 7362)} = 2.01$, $p = 0.07$), however there were significantly greater percentages of Asian/Pacific Islander students ($\alpha = 0.05$) than Black/African American or Hispanic/Latino students that were involved in research according to our broad definition. Participation in research, creative or senior projects *did* vary significantly among academic classification ($F_{(3, 7363)} = 125.22$, $p < 0.001$), FSU academic college ($F_{(14, 7352)} = 31.62$, $p < 0.001$), and academic field ($F_{(10, 7368)} = 22.84$, $p < 0.001$) groupings.

Seniors had the largest percentage of students that participated in research, creative or senior projects (33.2%) among academic classifications; freshmen had the smallest (10.5%). Significantly greater percentages of seniors participated in research, creative or senior projects ($\alpha = 0.001$) than juniors, sophomores and freshmen; larger percentages of juniors ($\alpha = 0.05$) than freshmen and sophomores. No significant differences occurred between freshmen and sophomores. Differences in academic classification may be due in part to the overrepresentation of seniors in the study sample.

The FSU College of Engineering had the greatest percentage of participants that were involved in research, creative or senior projects (38.4%) among FSU academic colleges; the College of Business had the lowest (11.3%). The colleges of Arts and Sciences (35.3%), Music (37.9%), and Engineering (38.4%) had significantly higher percentages ($\alpha = 0.05$) of participants that were involved in research, creative or senior projects than all other academic colleges with

the exceptions of the colleges of Communications (31.3%), Social Work (27.6%), and Visual Arts, Theatre and Dance (30.5%).

Participants in Physical sciences fields were most involved in research, creative or senior projects (38.7%) among academic field classifications; Business fields were least involved (11.3%). Physical sciences fields had significantly higher percentages of participants that were involved in research, creative or senior projects ($\alpha = 0.05$) than Life science and Engineering fields, more ($\alpha = 0.01$) than Arts fields, and more ($\alpha = 0.001$) than Social and Behavioral sciences, Computational sciences, Humanities, Undecided/Undeclared and Business fields. Figure 2.2 displays the sample distribution of participants broadly classified as researchers and non-researchers. Table 11 presents the percentage of study participants involved in research, creative, or senior projects according to gender, race/ethnicity, academic classification, FSU academic college, and academic field with *F*-values and *p*-values.

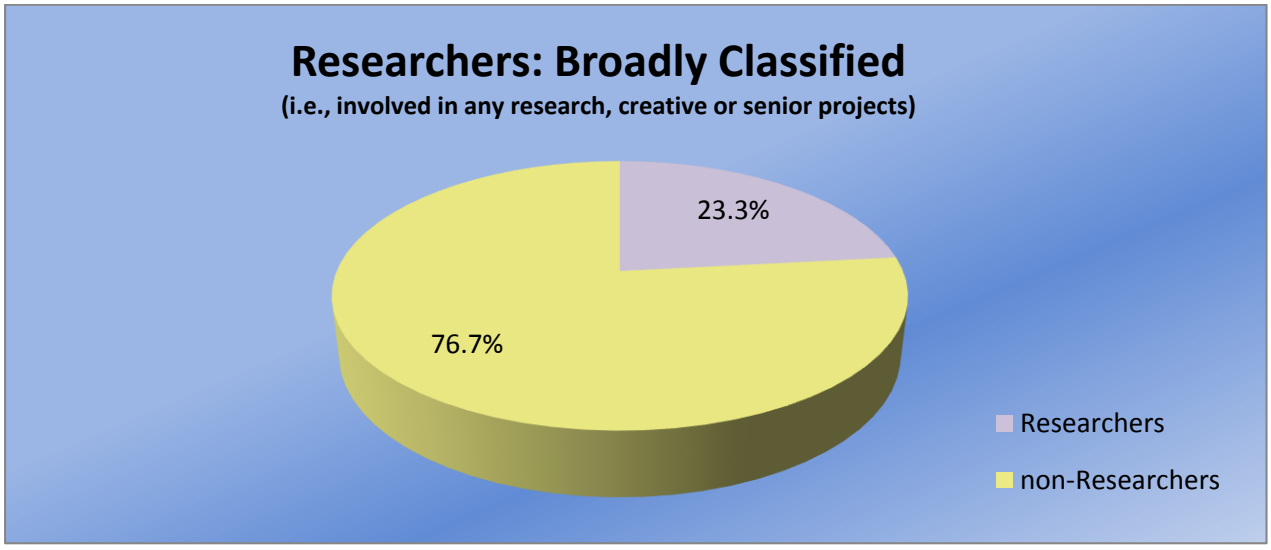


Figure 2.2. Distribution of study participants broadly classified as researchers and non-researchers

Table 11

Undergraduate research involvement by gender, race/ethnicity, academic class, college, and field

Categories		n	Involvement in research or creative project %	*F*-value	*p*-value
Gender	Women	5,071	23.4%	0.00	0.97
	Men	2,398	23.3		
Race/ Ethnicity	Asian/ Pacific Islander	297	28.8%	2.01	0.07
	White/ Caucasian	5,077	23.8		
	Native American	82	23.2		
	Hispanic/Latino	1,157	22.0		
	Black/African American	762	20.6		
	Other/Unspecified	94	20.4		
Academic Classification	Senior	3,460	33.2%	125.22	<0.001
	Junior	2,069	16.9		
	Sophomore	1,382	13.4		
	Freshman	556	10.5		
FSU Academic College	College of Engineering	284	38.4%	31.62	<0.001
	College of Music	161	37.9		
	College of Arts and Sciences	1,804	35.3		
	College of Communications and Information	403	31.3		
	College of Visual Arts, Theatre, and Dance	213	30.5		
	College of Social Work	87	27.6		
	College of Human Sciences	544	23.7		
	College of Social Science and Public Policy	842	21.4		
	College of Nursing	87	20.7		
	College of Criminology and Criminal Justice	302	18.9		
	College of Education	230	15.2		
	College of Applied Studies	32	12.5		
	College of Motion Picture Arts	16	12.5		
	Undergraduate Studies	1,571	11.7		
	College of Business	793	11.3		
Academic Field	Physical Sciences	261	38.7%	22.84	<0.001
	Life Sciences	510	31.8		
	Engineering	370	31.6		
	Arts	443	29.8		
	Social and Behavioral Sciences	2,745	25.2		
	Humanities	641	22.3		
	Allied Health Sciences	515	19.6		
	Computational Sciences	241	16.6		
	Education	293	15.0		
	Undecided/Undeclared	150	13.3		
	Business	1,200	11.3		

Note. One-way ANOVAs

Research narrowly defined: Worked with a mentor or faculty on research

We found that 17.5% of study participants indicated that they *worked with a mentor or faculty supervisor on research-related activities.* There were no significant gender differences in the percentage of participants according to our narrow definition of research involvement. However, the percentage of participants that worked with a mentor or faculty supervisor on research activities varied significantly among race/ethnicity ($F_{(5,\ 7363)} = 5.22$, $p < 0.001$), academic classification ($F_{(3,\ 7363)} = 78.24$, $p < 0.010$), FSU academic college ($F_{(14,\ 7352)} = 32.30$, $p < 0.001$), and academic field ($F_{(10,\ 7368)} = 33.65$, $p < 0.001$) groupings.

Asian/Pacific Islander students had the greatest percentage of study participants that worked with a mentor or faculty supervisor on research activities (27.4%) among race/ethnicity groupings; Black/African American students had the lowest (14.2%). There were significantly greater percentages of Asian/Pacific Islander students that worked with a mentor of faculty on research activities ($\alpha = 0.001$) than Black/African American, Hispanic/Latino and White/Caucasian students, and significantly greater percentages ($\alpha = 0.01$) than Other/Unspecified and Native American students. Significantly larger percentages of White/Caucasian students worked with a mentor or faculty supervisor on research activities ($\alpha = 0.05$) than Black/African American students.

Seniors had the highest percentage of participants that worked with a mentor or faculty supervisor on research activities (24.5%) among academic classifications; freshmen had the lowest (7.9%). Significantly larger percentages of seniors worked with a mentor or faculty supervisor on research ($\alpha = 0.001$) than juniors, sophomores and freshmen; higher percentages of juniors ($\alpha = 0.01$) than freshmen. No significant differences occurred between freshmen and sophomores.

The FSU College of Arts and Sciences had the greatest percentage of participants that worked with a mentor or faculty supervisor on research activities (31.6%) among FSU academic colleges; the College of Motion Picture Arts had the lowest (0.0%) followed by the College of Education (6.1%) and the College of Business (7.2%). The College of Arts and Sciences (31.6%) had a significantly greater percentage of participants that worked with a mentor or faculty supervisor on research activities ($\alpha = 0.001$) than all other academic colleges. The colleges of Engineering, Human Sciences, Visual Arts, Social Science, and Communication had significantly larger percentages of participants that worked with a mentor or faculty supervisor on research activities ($\alpha = 0.01$) than the College of Business and the College of Education.

Physical sciences fields had the greatest percentage of students that worked with a mentor or faculty supervisor on research activities; Education fields had the lowest. Physical and Life sciences fields had significantly greater percentages of participants that worked with a mentor or faculty supervisor on research activities ($\alpha = 0.001$) than all other academic fields. Business and Education fields had significantly smaller percentages of participants that worked with a mentor of faculty supervisor on research activities ($\alpha = 0.001$) than all other academic fields with the exception of Computational sciences fields and students categorized as Undecided/Undeclared. Physical and Life sciences fields had significantly greater percentages of participants that worked with a mentor or faculty supervisor on research ($\alpha = 0.01$) than all other academic fields; Business fields had a significantly lower percentage ($\alpha = 0.05$) than all other fields except for Computational sciences.

Figure 2.3 displays the sample distribution of participants narrowly classified as researchers and non-researchers. Table 12 presents the percentage of study participants that worked with a mentor or faculty supervisor on research activities according to gender, race/ethnicity, academic classification, FSU academic college, and academic field with *F*-values and *p*-values.

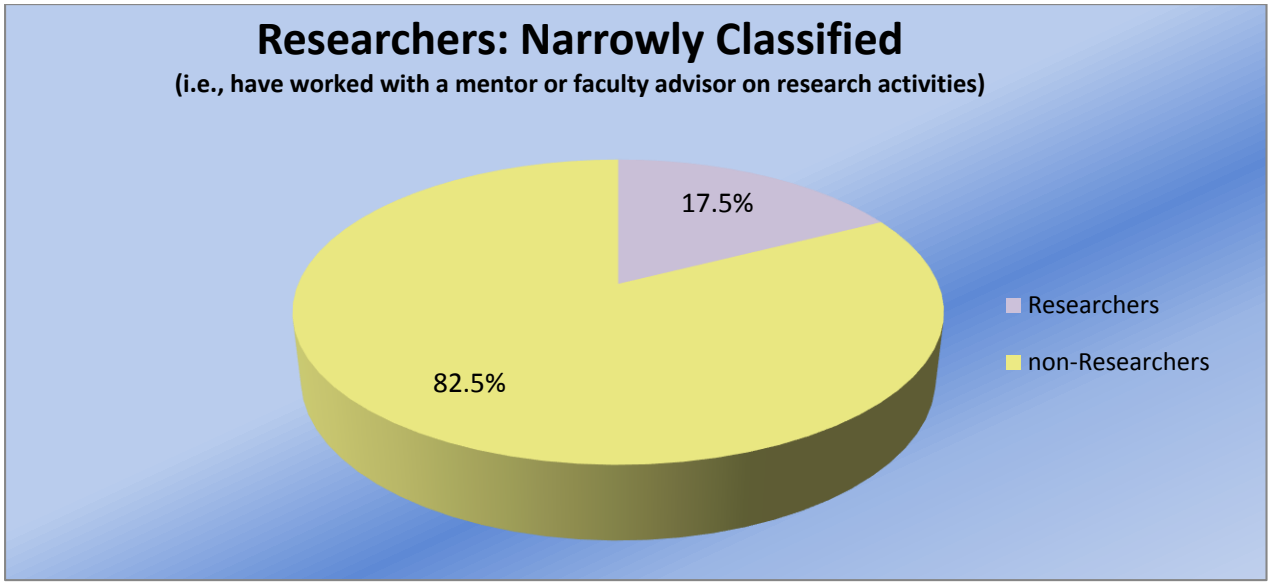


Figure 2.3 Distribution of study participants narrowly classified as researchers and non-researchers

Table 12

Narrowly defined research involvement by gender, race/ethnicity, academic class, college, and field

Categories		n	worked with mentor/faculty on research activities %	*F*-value	*p*-value
Gender	Men	2,398	18.0%	0.65	0.42
	Women	5,071	17.2		
Race/ Ethnicity	Asian/ Pacific Islander	297	27.4%	5.22	<0.001
	White/ Caucasian	5,077	17.5		
	Hispanic/Latino	1,157	17.2		
	Native American	82	15.9		
	Other/Unspecified	94	15.1		
	Black/African American	762	14.2		
Academic Classification	Senior	3,460	24.5%	78.24	<0.001
	Junior	2,069	12.9		
	Sophomore	1,382	10.5		
	Freshman	556	7.9		
FSU Academic Colleges	College of Arts and Sciences	1,804	31.6%	32.30	<0.001
	College of Visual Arts, Theatre, and Dance	213	23.5		
	College of Engineering	284	21.1		
	College of Human Sciences	544	19.7		
	College of Music	161	18.0		
	College of Communications and Information	403	17.1		
	College of Social Work	87	16.1		
	College of Social Science and Public Policy	842	13.8		
	College of Nursing	87	12.6		
	College of Criminology and Criminal Justice	302	12.6		
	Undergraduate Studies	1,569	9.5		
	College of Applied Studies	32	9.4		
	College of Business	793	7.2		
	College of Education	230	6.1		
	College of Motion Picture Arts	16	0.0		
Academic Field	Physical Sciences	261	39.8%	33.65	<0.001
	Life Sciences	510	34.3		
	Arts	443	19.0		
	Engineering	370	18.9		
	Social and Behavioral Sciences	2,745	18.5		
	Allied Health Sciences	515	17.7		
	Humanities	641	17.2		
	Computational Sciences	241	11.6		
	Undecided/Undeclared	150	10.7		
	Business	1,200	7.1		
	Education	293	5.8		

Note. One-way ANOVAs

Research Activities and Programs at FSU

The survey item used to broadly defined research involvement was also used as our primary logic item for further research-relevant items. There were a total of 1,720 study participants broadly classified as researchers; information was gathered from these participants to determine what types of undergraduate research-related activities/programs they were involved in.

Of the participants broadly classified as researchers many indicated that they participated in Directed Independent/Individual Study (34.9%), followed by (28.9%) in research or creative projects as part of their course, and (25.9%) in research method course(s); very few (2.6%) participated in Research Experiences for Undergraduates (REU) programs. Table 13 details the research-related activities/programs and creative projects that participants broadly classified as researchers were involved in as undergraduates.

Table 13

Research activities of study participants that were involved in research, creative and senior projects

	Frequency (*f*)	Percentage (%)
Directed Independent/Individual Study (DIS)	595	34.9%
Research/Creative project as part of course	493	28.9
Research Method course	442	25.9
Research Intensive lab/course	283	16.6
Senior Project/Capstone Creative Project/Senior Recital	224	13.1
Research Assistantship	216	12.7
Senior/Honors Thesis	194	11.4
Other (WIMSE REP, psychology studies, etc…)	168	9.9
Community-based research project	123	7.2
Non-FSU research award	104	6.1
Undergraduate Research Opportunities Program (UROP)	80	4.7
FSU-funded research award (e.g., URCAA, MRCE)	66	3.9
Research Experiences for Undergraduates (REU) program	45	2.6

Note. *n*= 1,704

Study participants broadly classified as researchers were asked *how they shared their work from research-related activities and/or creative projects*. The vast majority (75.9%) indicated that they talked to their family and friends about their research or creative projects. Many (43.4%) presented their research or creative projects in a class, seminar or departmental presentation. Less than 3% of participants broadly classified as researchers published their research or creative projects, or presented at a graduate or professional level symposium. Table 14 details the how study participants have shared their work on research and creative projects.

Table 14

How study participants have shared their research and/or creative projects

	Frequency (*f*)	Percentage (%)
Talked to friends/family members	1162	75.9%
Class/seminar/departmental presentations	665	43.4
Oral/poster presentation at undergraduate symposium	271	17.7
Oral/poster presentation at graduate level symposium	243	15.9
Exhibition/presentation/performance at FSU	222	14.5
Exhibition/presentation/performance not at FSU	100	6.5
Thesis Defense	81	5.3
Non-FSU undergraduate symposium	79	5.2
Other	33	2.2
Non-FSU grad/professional symposium	31	2.0
Published in graduate/professional/scholarly journal	31	2.0
Published in undergraduate research journal	23	1.5
Grad/professional symposium at FSU	13	0.8

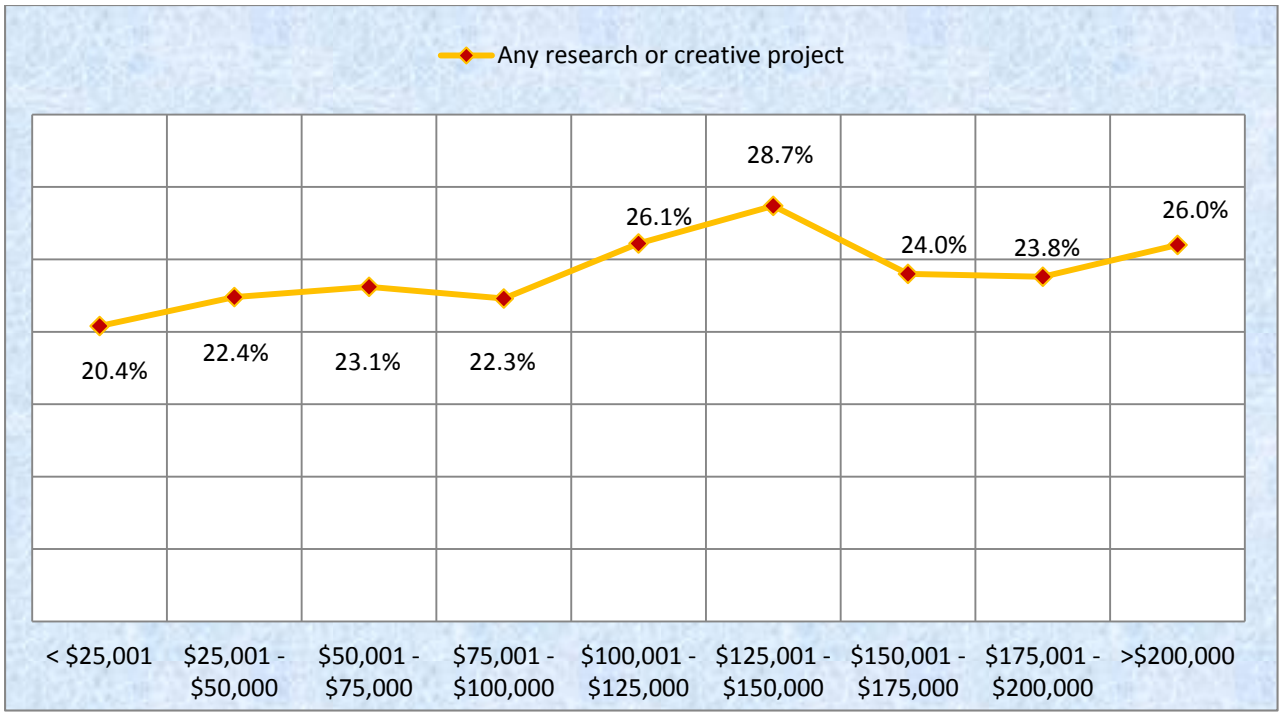
Note. *n*= 1,531

Research Involvement by Family Income Level

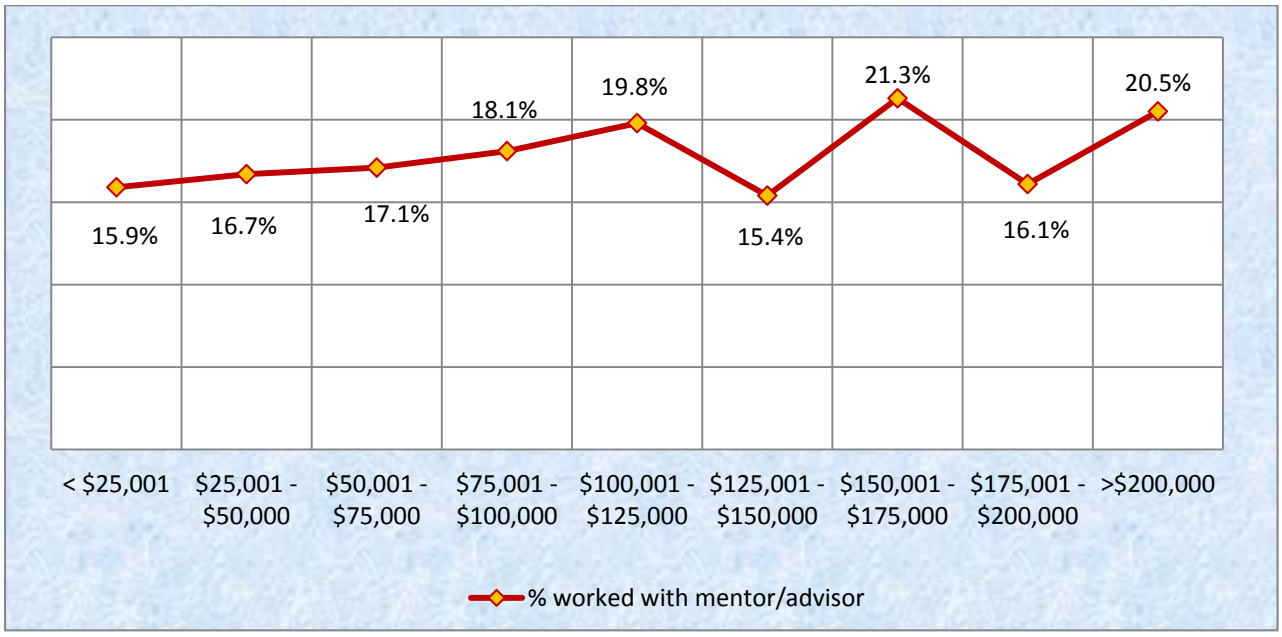
The family income of study participants was derived from their Free Application for Federal Student Aid (FAFSA) data and used to assess the income levels of undergraduates involved in research activities. We found that when income level was grouped according to $25,000 increment levels, research involvement varied significantly among family income levels. This held true whether research involvement was broadly ($F_{(8, 6955)} = 2.60$, $p = 0.01$) or narrowly ($F_{(8, 6955)} = 2.00$, $p = 0.04$) defined.

Study participants from the $125,001 to $150,000 income level had the largest percentage (28.7%) of students that were involved in research, creative and senior projects; participants from the $0 - $25,000 income level had the smallest (20.4%). Figure 2.4 displays percentage of students that indicated that they were *involved in research, creative or senior projects* per family income level. Only participants from the $0 - $25,000 income level had percentages that were significantly lower than the mean ($t_{(1,211)} = 2.52$, $p = 0.01$).

Interestingly, study participants from the $125,001 to $150,000 income level had the smallest percentage (15.4%) of students that *worked with a mentor or faculty supervisor on research activities*; participants from the $150,001 - $175,000 income level had the largest (21.3%). Figure 2.5 displays percentage of students that indicated that they worked with a mentor or faculty supervisor on research activities per family income level.



Percentage of survey participants that participated in research or creative project by family income level. Percentages that are situated below the line are those that are lower than the mean percentage of study participants that have participated in research or creative projects (23.3%); percentages situated above the line are greater than the mean



Percentage of participants that worked with a mentor or faculty supervisor on research. Percentages that are situated below the line are those that are lower than the mean percentage of study participants that worked with a mentor/faculty advisor on research (17.5%); percentages situated above the line are greater than the mean

Income levels among study participants were not evenly distributed; therefore, we also evaluated family income level by grouping income levels into the following ten percentile cohorts:

- 1^{st} - 10^{th} percentile = $0.00 - $13,962.50
- 11^{th} - 20^{th} percentile = $13,962.51 - $28,684.20
- 21^{st} - 30^{th} percentile = $28,684.21 - $43,719.00
- 31^{st} - 40^{th} percentile = $43,719.01 - $61,253.20
- 41^{st} - 50^{th} percentile = $61,253.21 - $79,055.00
- 51^{st} - 60^{th} percentile = $79,055.01 - $97,545.40
- 61^{st} - 70^{th} percentile = $97,545.41 - $119,976.20
- 71^{st} - 80^{th} percentile = $119,976.21 - $148,203.60
- 81^{st} - 90^{th} percentile = $148,203.61 - $202,139.70
- 91^{st} -100^{th} percentile = $202,139.71+

We found that involvement in research, creative and senior projects (i.e., broadly defined research involvement) varied significantly ($F_{(9,\ 6954)} = 2.76$, $p < 0.001$) among family income levels that were grouped evenly into ten percentile ranges.

Study participants from the $119,976.21 to $148,203.60 income level (71^{st} - 80^{th} percentile) had the largest percentage of students (26.8%) that were involved in research, creative and senior projects; participants from the $13,962.51 to $28,684.20 income level ($11^{th}$ - 20^{th} percentile) had the smallest (19.7%). Participants from the $13,962.51 - $28,684.20 income level had a significantly lower percentage of participation in research, creative or senior projects than the overall mean of 23.3%. Figure 2.6 displays percentage of students that indicated that they participated in *research, creative or senior projects* by family income level.

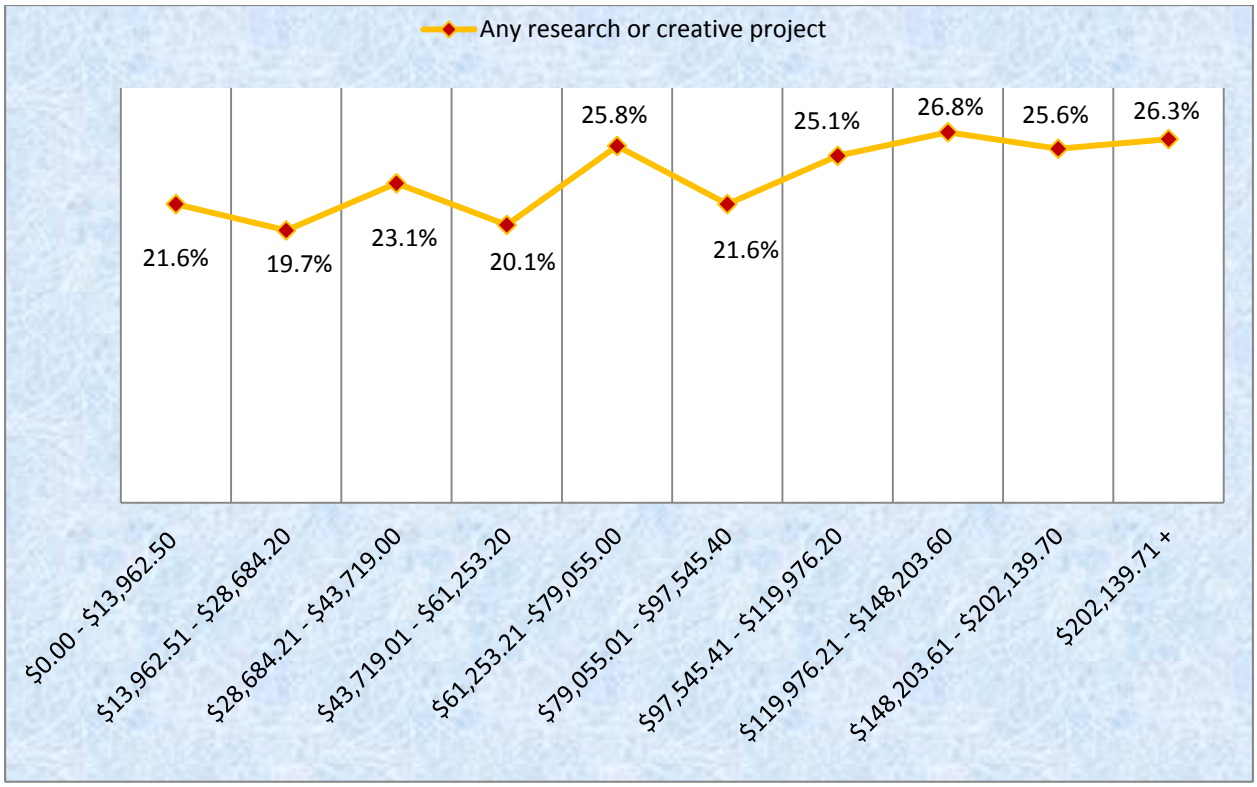


Figure 2.6. Percentage of participants that participated in research, creative or senior projects by family income percentile levels. Percentages that are situated below the line are those that are lower than the mean percentage of study participants that have participated in research, creative, or senior projects (23.3%); percentages situated above the line are greater than the mean

Strikingly, involvement in research according to whether the student worked with a mentor or faculty supervisor on research activities (i.e., narrowly defined research involvement) did not vary significantly ($F_{(9,\ 6954)} = 0.90$, $p = 0.53$) among family income levels that were grouped into ten equal percentile ranges. Nevertheless, study participants from the $202,139.71+ income level (91st - 100th percentile) had the largest percentage (20.4%) of students that *worked with a mentor or faculty supervisor on research activities*; participants from the $43,719.01 - $61,253.20 income level (31st - 40th percentile) had the smallest (16.1%). Figure 2.7 displays percentage of students that indicated that they worked with a mentor or faculty supervisor on research activities per family income level.

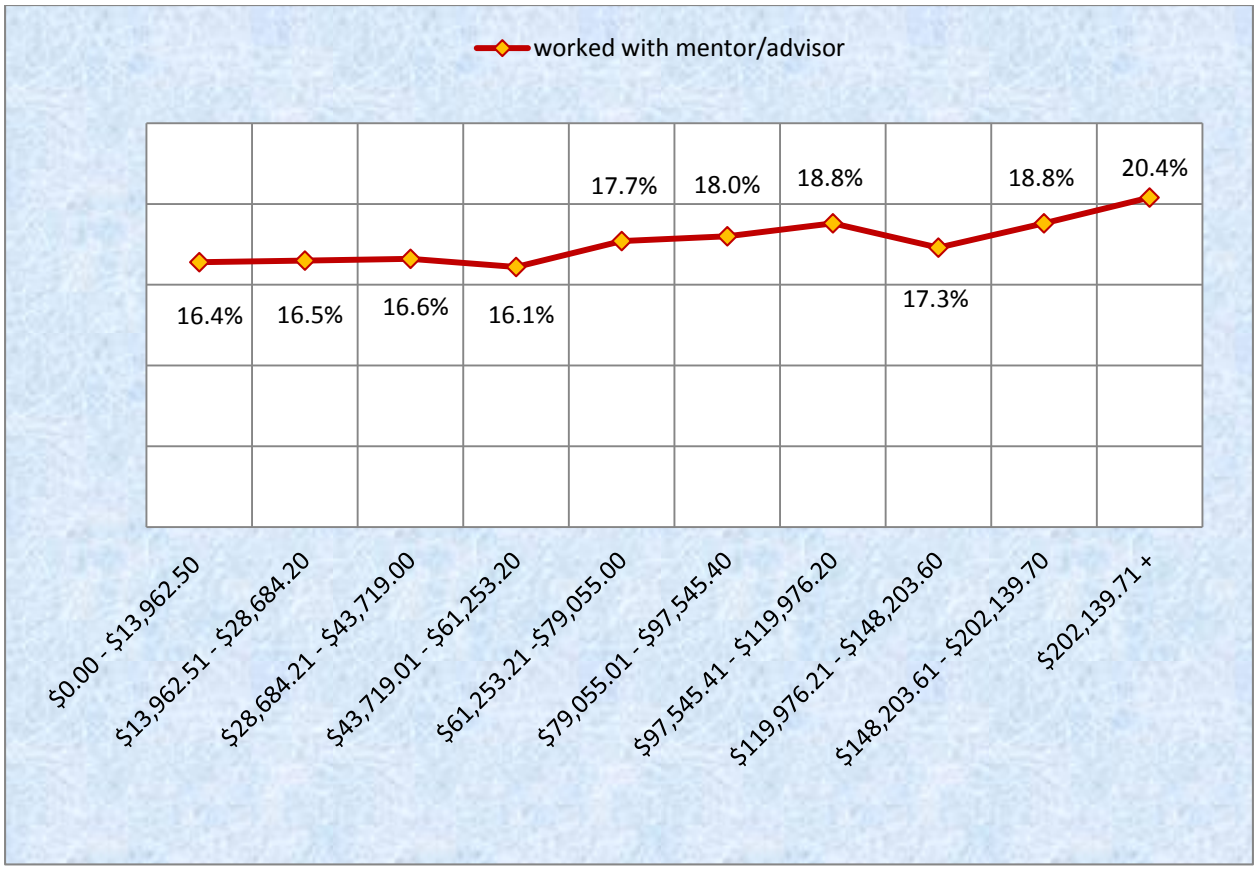
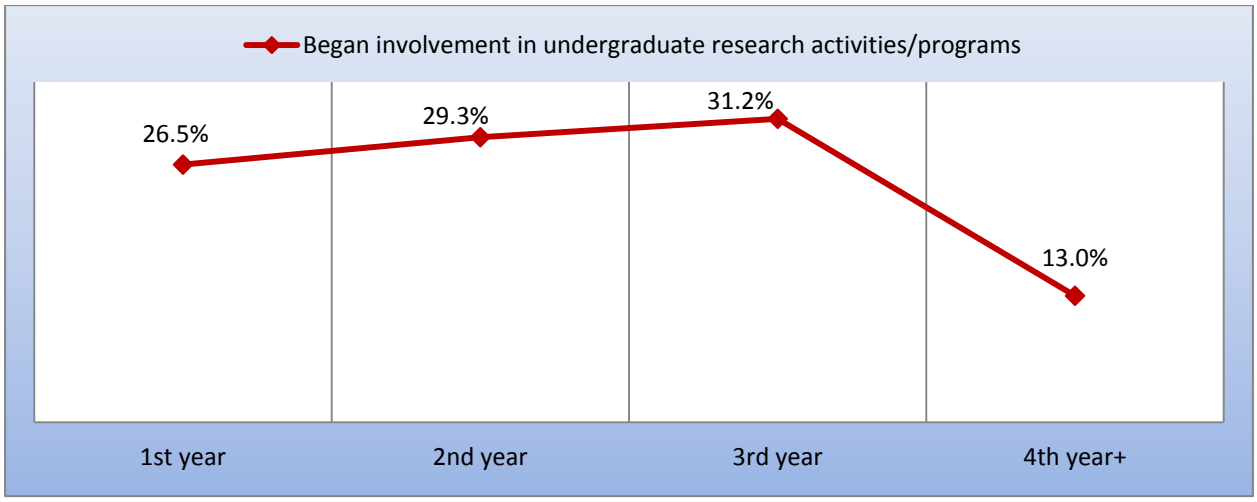


Figure 2.7. Percentage of participants that worked with a mentor or faculty supervisor on research by family income percentile levels. Percentages that are situated below the line are those that are lower than the mean percentage of study participants that worked with a mentor/faculty advisor on research (17.5%); percentages situated above the line are greater than the mean

When do Undergraduates Begin their Research Involvement?

Study participants that indicated that they were involved in research, creative and senior projects also indicated the academic year (i.e., 1st year, 2nd year, 3rd year, and 4th+ year) that they began their involvement. Start of involvement in research for participants broadly classified as researchers did not vary significantly by year ($F_{(4,\ 1427)} = 0.55$, $p = 0.70$). Nonetheless, 77% of participants indicated that they began their involvement in undergraduate research programs and activities before their 4th year of undergraduate work. Figure 2.8 displays percentages of participants that began their involvement in research during their 1st, 2nd, 3rd, or 4th+ year of undergraduate study.



Undergraduate year of study that participants began their involvement in research. Percentage of study participants that began their involvement in research by undergraduate year of study

Data also suggests that from junior to senior year undergraduate involvement in research, creative or senior projects nearly doubles with a 16.3% increase. This also holds true for undergraduates working with mentors or faculty supervisors on research activities with an 11.6% increase from junior to senior year. Further longitudinal analyses are necessary to support assumptions. Figure 2.9 displays undergraduate research involvement by academic classification.

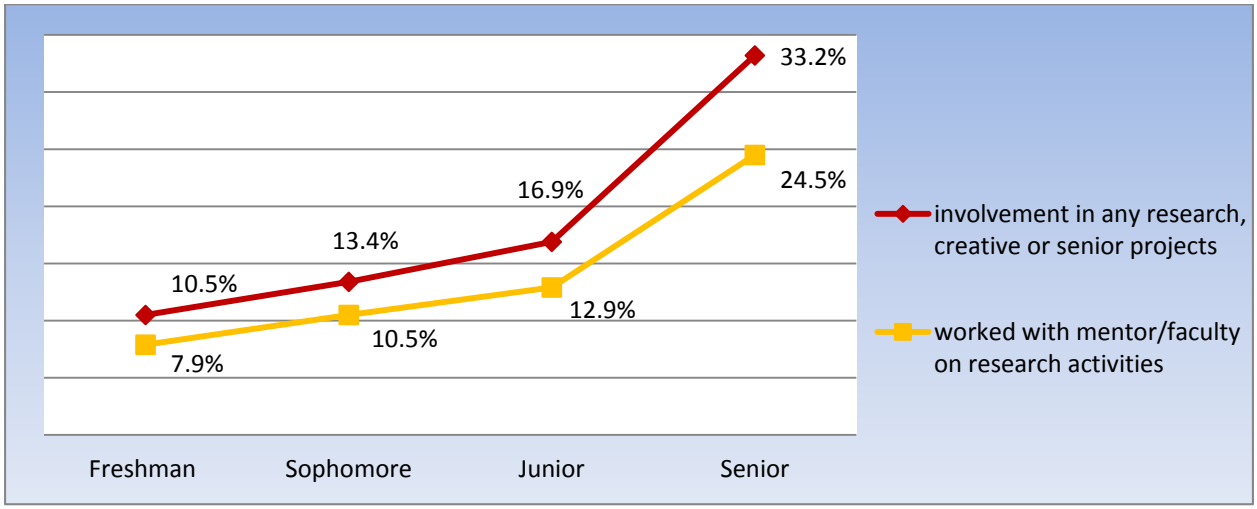


Figure 2.9. Involvement in undergraduate research by academic classification

Confidence in Research Abilities

Study participants that participated in research, creative or senior projects were asked a variety of questions that assessed *confidence in research-relevant abilities* attributed to their research experiences compared to their other college experiences. All items assessing confidence in research-relevant abilities attributed to research experiences had significantly higher ratings ($\alpha = 0.001$) than confidence in research-relevant abilities attributed to non-research experiences. In particular, significantly more confidence was attributed to research experiences ($t > 10.00$, $p < 0.001$) than non-research experiences (i.e., other undergraduate experiences) for the following survey items:

- ability to conduct research/creative projects using methods in my area of study
- ability to observe/collect data in my area of study
- ability to analyze data appropriate to my area of study
- ability to speak about how my research/creative project relates to my area of study
- ability to answer questions/concerns from others regarding my research/creative project
- ability to develop research/creative projects that could help extend my current work

Table 15 shows study participant responses to items with the prompt: *how confident are you in your ability to...* Highlighted items in the table indicate those items that had particularly large mean differences between confidence attributed to research experiences and confidence attributed to other college experiences.

Table 15

Confidence in research-relevant abilities of study participants attributed to their research and non-research experiences

How confident are you in your ability to…		Because of my research experiences		Because of my ***non-research*** experiences			
Item	*df*	Mean (*SD*)		Mean (*SD*)		*t*-value	*p*-value
seek guidance from faculty or other scholars in my area of study***	1073	4.0	(1.0)	3.8	(1.0)	6.76	<0.001
make use of primary literature in my area of study***	1065	3.9	(1.0)	3.6	(1.0)	9.38	<0.001
critically analyze the value of different sources of information***	1066	3.9	(1.0)	3.7	(1.0)	8.91	<0.001
formulate original questions for research/creative projects***	1059	3.8	(1.0)	3.5	(1.0)	9.80	<0.001
conduct a research/creative project using methods in my area of study***	1056	3.8	(1.0)	3.4	(1.0)	11.88	<0.001
observe/collect data in my area of study***	1048	4.0	(1.0)	3.6	(1.0)	13.48	<0.001
analyze/interpret data appropriate to my area of study***	1051	3.9	(1.0)	3.5	(1.0)	11.62	<0.001
speak about how my research/creative project relates to my area of study***	1057	3.9	(1.0)	3.6	(1.0)	11.32	<0.001
present my research/creative findings orally or in an exhibition/performance***	1064	3.7	(1.1)	3.4	(1.1)	8.86	<0.001
answer questions or concerns from others regarding my research/creative project***	1058	3.8	(1.0)	3.5	(1.0)	11.58	<0.001
develop research/creative projects that could help extend my current work***	1056	3.7	(1.1)	3.4	(1.0)	10.68	<0.001

Note. Paired sample t-tests; *** p<0.00; 5-pt confidence scale responses (5 = Extremely; 4 = Moderately; 3 = Somewhat; 2 = Not so; 1 = Not at all)

General Undergraduate Dispositions of Researchers

Study participants that were broadly classified as researchers were asked a variety of questions to assess *general undergraduate student dispositions* attributed to their research experiences compared to their other college experiences. The following survey items assessing general undergraduate dispositions attributed to participants' research experiences had significantly *higher* ratings ($\alpha = 0.001$) than the same dispositions attributed to their non-research experiences:

- I am more comfortable discussing research with others
- I am more connected to my academic field
- I am more critical about people's claims
- I know what I want to do as a career
- I more often explore different ways of thinking about the topic/issue at hand
- I go out of my way to read material related to my topic/issue of interest
- I am both challenged and supported at my college/university

Interestingly, the following survey items assessing general undergraduate dispositions attributed to participants' research experiences had significantly *lower* ratings ($\alpha = 0.001$) than the same dispositions attributed to their non-research experiences:

- I have more self-confidence
- I have a better understanding of myself
- I can deal efficiently with unexpected events
- I can usually find several solutions when I am confronted with a problem
- I try to understand other people's point of view
- I can develop research/creative projects that could help extend my current work

Table 16 shows study participant responses to items with the prompt: *I feel like I …* Highlighted items in the table indicate those items that had particularly large mean differences between dispositions attributed to research experiences and dispositions attributed to other college experiences.

Table 16

General undergraduate dispositions of study participants attributed to the research and non-research experiences

I feel like I …		Because of my research experiences		Because of my ***non-research*** experiences			
Item	*df*	Mean (*SD*)		Mean (*SD*)		*t*-value	*p*-value
am more comfortable discussing research with others***	1002	4.1	(0.9)	3.6	(0.9)	14.25	<0.001
am more connected to my academic field***	1002	4.1	(0.9)	3.8	(0.9)	10.36	<0.001
have better time-management skills	1001	3.7	(1.0)	3.8	(0.9)	1.84	0.07
am more interested in attending graduate school	998	3.8	(1.1)	3.7	(1.0)	1.86	0.06
am more critical about people's claims***	997	3.9	(0.9)	3.7	(0.9)	6.63	<0.001
know what I want to do as a career***	993	3.6	(1.1)	3.7	(1.0)	3.25	<0.001
would like to become a professor	995	2.7	(1.3)	2.8	(1.2)	1.81	0.07
more often explore different ways of thinking about the topic/ issue at hand***	980	4.0	(0.9)	3.8	(0.8)	5.22	<0.001
go out of my way to read material related to my topic/ issue of interest***	979	3.9	(1.0)	3.6	(1.0)	6.90	<0.001
have a strong sense of affiliation with my college/university	986	3.8	(1.0)	3.8	(1.0)	0.37	0.71
am both challenged and supported at my college/university***	984	3.9	(1.0)	3.8	(0.9)	3.42	<0.001
have been encouraged to develop my strengths and talents at my college/university*	984	3.9	(1.0)	3.8	(0.9)	2.14	0.03
am a part of a close and supportive community of colleagues and friends	982	3.8	(1.0)	3.8	(1.0)	1.39	0.17
have something more to contribute to society	990	4.0	(0.9)	4.0	(0.8)	0.93	0.36
have more self-confidence***	988	3.9	(1.0)	4.0	(0.9)	3.66	<0.001
have a better understanding of myself***	984	3.8	(1.0)	4.0	(0.9)	6.88	<0.001
can deal efficiently with unexpected events***	983	3.8	(0.9)	4.0	(0.8)	5.85	<0.001
can usually find several solutions when I am confronted with a problem***	992	3.9	(0.9)	4.0	(0.8)	4.14	<0.001
have more control over my learning*	989	3.9	(0.9)	3.8	(0.9)	2.56	0.01
take nothing at face value and always try to dig deeper	989	3.9	(0.9)	3.9	(0.9)	0.25	0.80
try to understand other people's point of view***	988	4.0	(0.9)	4.1	(0.8)	3.45	<0.001
refer to knowledge I have acquired in my courses	984	4.1	(0.9)	4.1	(0.9)	1.00	0.32

Note. Paired sample t-tests; * p<0.05, *** p<0.001; 5-pt Likert scale responses (5 = Strongly agree)

SECTION 3: COMPARISONS OF RESEARCHERS WITH NON-RESEARCHERS

We found that 56.2% of participants that indicated that they were involved in research, creative or senior projects *also* indicated that they worked with a mentor or faculty supervisor on research activities. Thus for the subsequent analysis, only study participants that could be *both* broadly and narrowly classified as researchers will be assessed as the researcher group. This researcher group (i.e., classification) will only consist of study participants that indicated that they were involved in research, creative and senior projects *and* worked with a mentor or faculty supervisor on research activities. Participants that had *not* been involved in research, creative or senior projects and *never* worked with a mentor or faculty supervisor on research activities will be assessed as the non-researcher group.

General Demographics

There were 966 participants now classified as researchers and 5,383 participants classified as non-researchers to be used for comparisons. On average researchers had significantly higher cumulative college GPAs ($t_{(2,005)} = 16.68$, $p < 0.001$), high school GPAs ($t_{(1,471)} = 7.90$, $p < 0.001$), SAT ($t_{(1,142)} = 7.54$, $p < 0.001$) and ACT ($t_{(984)} = 8.32$, $p < 0.001$) scores, more total degree hours ($t_{(1,395)} = 21.38$, $p < 0.001$), and higher FAFSA-reported annual family incomes ($t_{(5,953)} = 2.48$, $p = 0.01$) than non-researchers. Table 17 details the results from independent mean differences tests between researchers and non-researchers for students' cumulative college and high school GPAs, SAT and ACT scores, total degree hours, and annual family income.

Table 17

General demographic comparisons of researchers and non-researchers

Categories	Researchers Mean	Non-researchers Mean	*t*-value	*df*	*p*-value
Cumulative College GPA	3.41	3.06	16.68	2,005	<0.001
High School GPA	3.35	2.95	7.90	1,471	<0.001
SAT Score	1185.78	1145.58	7.54	1,142	<0.001
ACT Score	26.29	25.09	8.32	984	<0.001
Total Degree Hours	104.90	83.46	21.38	1,395	<0.001
Family Income (Annual)	$111,315.49	$101,292.98	2.48	5,953	0.01

Note. Equal variances not assumed

Interest in Undergraduate Research Involvement among Non-researchers

In our sample of 7,469 FSU undergraduate students, we found that 5,328 of these students had *not* participated in any research, creative or senior projects, nor had they ever worked with a mentor or faculty supervisor on research-related activities. Their interest in participating in research-related activities was assessed. The majority of these non-researchers (61.7%) indicated that they were either moderately interested (25.2%) or somewhat interested (36.5%) in participating in research-related activities. Figure 3.1 displays participants classified as non-researchers' responses to this survey.

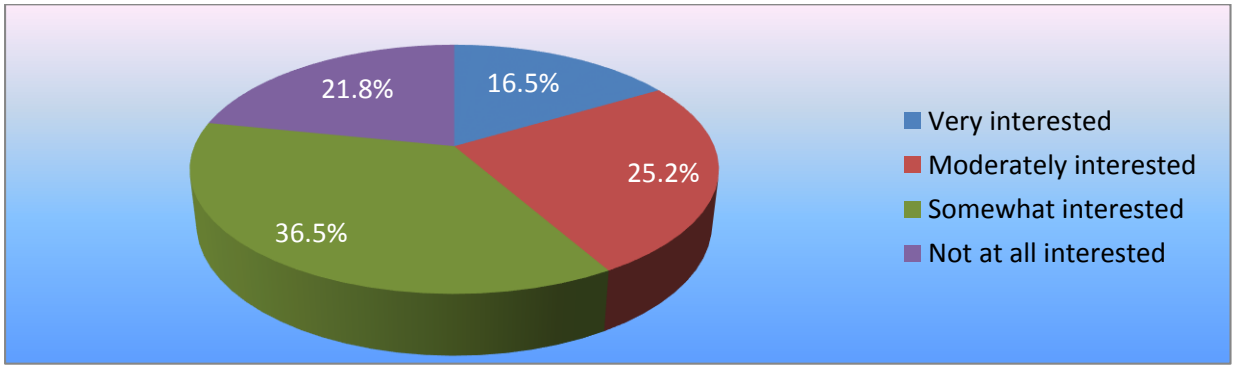


Figure 3.1. Responses to how interested non-researchers were in participating in research

Further analyses of non-researchers interest in participating in research-related activities and programs were conducted. Interest in participating in research activities varied significantly by gender ($F_{(1, 5317)} = 8.31$, $p = 0.004$) and among race/ethnicity ($F_{(5, 5317)} = 16.14$, $p < 0.001$), academic classification ($F_{(3, 5315)} = 66.70$, $p < 0.001$), FSU academic college ($F_{(14, 5315)} = 21.90$, $p < 0.001$), and academic field ($F_{(10, 5317)} = 40.10$, $p < 0.001$).

Among non-researchers, men were significantly more interested in participating in research-related activities ($\alpha = 0.01$) than women. Asian/Pacific Islander and Hispanic/Latino students were significantly more interested in participating in research activities ($\alpha = 0.01$) than Black/African American and White/Caucasian students. Sophomores were significantly more interested ($\alpha = 0.001$) than juniors and seniors; freshmen more ($\alpha = 0.01$) than seniors and less ($\alpha = 0.05$) than sophomores. Students in the College of Engineering were most interested in participating in research activities and students in the College of Education were least interested. Physical Sciences, Life Sciences, and Engineering majors were significantly more interested in participating in research activities ($\alpha = 0.001$) than all other academic fields; Arts, Education, and Business majors were significantly less interested in participating in research activities ($\alpha = 0.05$) than all other academic fields. Table 18 details non-researchers ratings for their interest in participating in research activities by gender, race/ethnicity, academic classification, FSU academic college, and academic field with *F*-values and *p*-values.

Table 18

Non-researcher interest in participating in research by gender, race/ethnicity, academic class, college, and field

Categories		*n*	Interest in participating in research rating	*F*-value	*p*-value
Gender	Men	1,699	2.42	8.31	<0.01
	Women	3,619	2.34		
Race/ Ethnicity	Asian/Pacific Islander	193	2.61	16.14	<0.001
	Hispanic/Latino	833	2.60		
	Native American	60	2.48		
	Black/African American	558	2.40		
	Other/Not specified	73	2.30		
	White/Caucasian	3,601	2.29		
Academic Class	Sophomore	1,121	2.61	66.70	<0.001
	Freshman	460	2.50		
	Junior	1,607	2.45		
	Senior	2,128	2.14		
FSU Academic College	College of Engineering	171	2.71	21.90	<0.001
	Undergraduate Studies	1,309	2.59		
	College of Arts and Sciences	1,069	2.54		
	College of Social Science and Public Policy	631	2.36		
	College of Social Work	61	2.31		
	College of Human Sciences	379	2.26		
	College of Communications and Information	262	2.22		
	College of Visual Arts, Theatre, and Dance	137	2.17		
	College of Criminology and Criminal Justice	235	2.11		
	College of Nursing	63	2.13		
	College of Applied Studies	26	2.08		
	College of Business	675	2.05		
	College of Music	94	2.02		
	College of Motion Picture Arts	14	2.00		
	College of Education	190	1.84		
Academic Field	Life Sciences	311	3.03	40.10	<0.001
	Physical Sciences	145	2.87		
	Engineering	245	2.71		
	Allied Health Sciences	379	2.51		
	Undecided/Undeclared	120	2.44		
	Social and Behavioral Sciences	1,896	2.39		
	Humanities	474	2.38		
	Computational Sciences	194	2.36		
	Arts	290	2.13		
	Business	1,021	2.07		
	Education	243	1.89		

Note. One-way ANOVAs; 4pt interest scale (4=Very; 3=Moderately; 2=Somewhat; 1=Not at all)

Applied to Participate in Research Activities

Only 6.9% of the non-researchers had ever applied to participate in undergraduate research programs or research-related opportunities. Of these 334 non-researchers, a large percentage of them applied for a DIS (36.2%) and/or UROP (32.9%). Table 19 presents the undergraduate research programs and opportunities that non-researchers applied to participate in.

Table 19

Undergraduate research programs and opportunities applied to by non-research participants

	Frequency (*f*)	Percentage (%)
DIS	121	36.2%
UROP	110	32.9
FSU Honors Program	49	14.7
Other	39	11.7
REU	31	9.3
Non FSU Research Award	23	6.9
Community-Based Research Project	22	6.6
FSU Research Award	17	5.1

Note. *n*= 334

Continued Interest in Research Involvement

Study participants that indicated that they were involved in research, creative or senior projects and also indicated that they worked with a mentor or faculty supervisor on research activities (i.e., researchers) were asked *how interested they were in continuing their participation in undergraduate research-related activities and programs*. The majority of researchers (70.8%) indicated that they were either very interested (47.8%) or moderately interested (23.0%) in continuing their participation in research. Figure 3.2 displays student responses to the continued interest in research survey item.

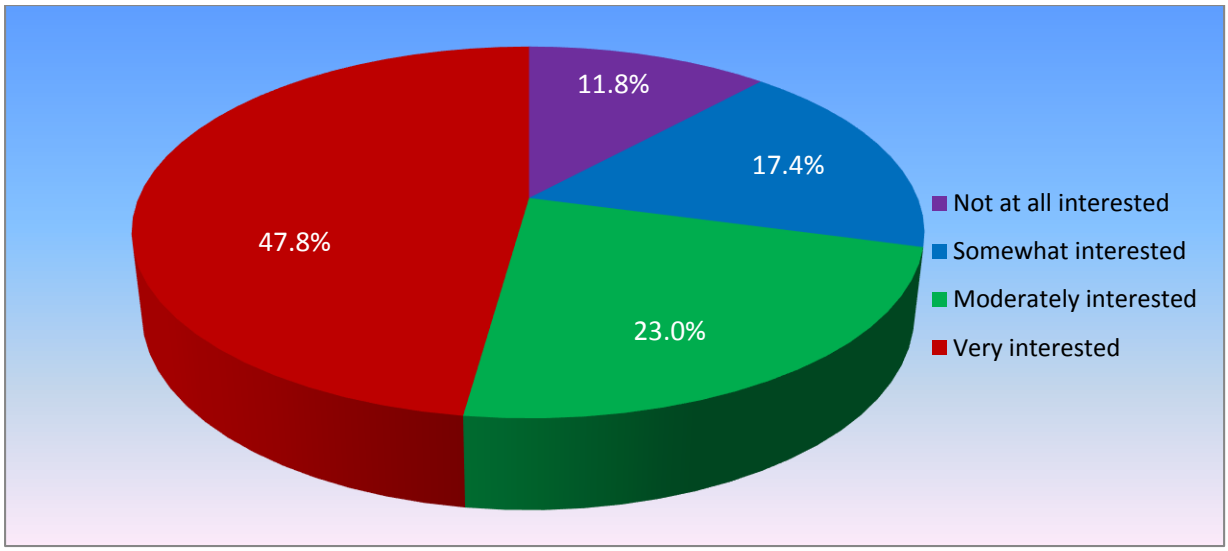


Figure 3.2. Responses to how interested they were in continuing their research participation

Further analysis of how interested undergraduates involved in research, creative and senior projects were in continuing their research participation was conducted. Interest in continuing research participation did not vary significantly by gender ($F_{(1, 786)} = 0.94$, $p = 0.33$), race/ethnicity ($F_{(5, 786)} = 0.81$, $p = 0.54$), or among FSU academic college ($F_{(13, 786)} = 1.51$, $p = 0.11$), but did vary significantly among academic classification ($F_{(3, 786)} = 7.17$, $p < 0.001$), and academic field ($F_{(10, 786)} = 2.56$, $p = 0.005$) groupings.

Seniors were significantly more interested than juniors ($\alpha = 0.001$) and sophomores ($\alpha = 0.05$); freshmen more ($\alpha = 0.01$) than juniors and more ($\alpha = 0.05$) than sophomores. Physical and Life sciences majors were most interested in continuing their participation in research. Business and Education majors as well as participants classified as Undecided/Undeclared were least interested in continuing their participation in research. Table 20 details researchers' ratings for their interest in continuing research participation by gender, race/ethnicity, academic classification, FSU academic college, and academic field with *F*-values and *p*-values.

Table 20

Interest in continuing research ratings among researchers by gender, race/ethnicity, academic class and field

Categories		*n*	Interest in continuing research rating	*F*-value	*p*-value
Gender	Men	259	3.12	0.94	0.33
	Women	528	3.04		
Race/ Ethnicity	Native American	7	3.43	0.81	0.54
	Other/Not specified	11	3.27		
	Hispanic/Latino	120	3.18		
	Asian/Pacific Islander	54	3.06		
	White/Caucasian	544	3.05		
	Black/African American	51	2.90		
Academic Class	Junior	147	3.36	7.17	<0.001
	Sophomore	53	3.30		
	Senior	571	2.98		
	Freshman	16	2.56		
FSU Academic College	College of Visual Arts, Theatre, and Dance	32	3.28	1.51	0.11
	College of Arts and Sciences	401	3.16		
	College of Engineering	45	3.11		
	College of Social Science and Public Policy	71	3.10		
	Undergraduate Studies	47	3.04		
	College of Human Sciences	57	2.93		
	College of Criminology and Criminal Justice	26	2.92		
	College of Communications and Information	43	2.88		
	College of Music	17	2.88		
	College of Nursing	5	2.80		
	College of Education	8	2.75		
	College of Business	25	2.64		
	College of Social Work	9	2.22		
	College of Applied Studies	1	2.00		
	College of Motion Picture Arts	0	###		
Academic Field	Physical Sciences	77	3.26	2.562	0.005
	Life Sciences	120	3.26		
	Computational Sciences	16	3.19		
	Engineering	49	3.16		
	Arts	49	3.14		
	Humanities	70	3.11		
	Allied Health Sciences	41	3.02		
	Social and Behavioral Sciences	314	3.01		
	Business	36	2.50		
	Education	10	2.50		
	Undecided/Undeclared	5	2.20		

Note. One-way ANOVAs; 4pt interest scale (4=Very; 3=Moderately; 2=Somewhat; 1=Not at all)

Researcher Role-Identification

Researchers and non-researcher were asked several survey items that assessed how much they identified with being a researcher (i.e., researcher role-identity salience). A total of 20 items were used for this analysis. Most of these survey items were adapted from role-identity salience studies conducted by Stryker and Serpe (1982) and Callero (1985); four items (i.e., items 5, 6, 7 and 20 presented in Table 24) were inspired by Thoits' (1983) conceptualizations regarding commitment to role-identities. As expected, researchers had significantly higher ratings (α = 0.001) on all researcher role-identity salience items than non-researchers, except for item 11 "*it wouldn't matter to most people I know if I decided to give up doing research",* item 12 "*many of the people that I know are not aware that I am a researcher"* and item 14 "*no one would be surprised if I just stopped doing research"*. In particular, researchers had much higher ratings for the following researcher role-identity salience items (t >20.00, p < 0.001) than non-researchers:

- Doing research is something I rarely think about
- Doing research is an important part of who I am
- I am heavily involved in research-related activities
- I spend much of my time doing research
- Other people think that doing research is important to me
- Approximately, how many hours per week do you spend doing research-related activities

Table 21 presents researchers and non-researchers mean ratings for the researcher role-identification items used in this study. Highlighted items in the table indicate those items that had particularly large mean differences between researcher and non-researcher ratings.

Table 21

Comparison of researcher role-identity salience item responses between researchers and non-researchers

Item	Researchers Mean (*SD*)	Non-researchers Mean (*SD*)	*t*-value	*df*	*p*-value
1. Doing research is something I rarely think about (R)	3.6 (1.2)	2.5 (1.2)	23.31	5,581	0.00
2. I would feel a loss if I were forced to give up doing research	3.4 (1.2)	2.5 (1.0)	18.56	1,002	0.00
3. I really don't have any clear feelings about doing research (R)	3.4 (1.1)	2.6 (1.0)	19.18	1,022	0.00
4. Doing research is an important part of who I am	3.4 (1.1)	2.4 (1.0)	22.80	1,015	0.00
5. I am heavily involved in research related activities	3.3 (1.1)	2.1 (0.9)	30.23	987	0.00
6. I spend much of my time doing research	3.1 (1.2)	2.2 (1.0)	21.80	989	0.00
7. I am likely to choose a career in research	3.1 (1.2)	2.5 (1.0)	15.20	975	0.00
8. Many people think of me in terms of being a researcher	2.9 (1.1)	2.1 (1.0)	16.96	994	0.00
9. Other people think that doing research is important to me	3.3 (1.1)	2.3 1.0)	25.98	1,020	0.00
10. It is important to my friends and relatives that I continue as a researcher	2.9 (1.1)	2.2 (1.0)	15.40	1,007	0.00
11. It wouldn't matter to most people I know if I decided to give up doing research (R)	2.7 (1.0)	2.9 (1.0)	5.20	1,063	0.00
12. Many of the people that I know are not aware that I am a researcher (R)	2.9 (1.0)	3.2 (0.9)	9.77	989	0.00
13. Many of the people that I know expect me to continue as a researcher	3.0 (1.1)	2.5 (0.9)	13.48	990	0.00
14. No one would be surprised if I just stopped doing research (R)	3.1 (1.1)	3.0 (0.9)	1.73	992	0.09
15. Many people would probably be disappointed in me if I just decided to stop doing research	2.9 (1.1)	2.6 (0.9)	8.73	979	0.00
16. Being a research is an important part of my identity	3.1 (1.1)	2.4 (1.0)	17.05	1,004	0.00
17. Approximately, how many people do you know through research in your field of study?	11.2 (16.0)	1.9 (8.3)	15.80	854	0.00
18. About how many are important to you?	3.3 (4.7)	0.7 (2.5)	14.81	841	0.00
19. About how many participate in other activities with you?	2.8 (5.2)	0.8 (2.5)	10.61	823	0.00
20. Approximately, how many hours per week do you spend doing research related activities?	8.7 (7.5)	2.0 (4.5)	24.43	880	0.00

Note. (R) reverse coded items; items 1 - 16 were rated on a 5pt Likert scale (5=strongly agree); items 17-20 were ratio scale items; equal variances not assumed

General Dispositions of Undergraduates

Study participants were asked several survey items that assessed their general undergraduate dispositions. Researchers had significantly higher ratings for the following items than non-researchers[2]:

Item Prompt: *because of my undergraduate experiences I feel like I...*

- am more connected to my academic field***
- am more interested in attending graduate school***
- am more critical about people's claims***
- would like to become a professor***
- more often explore different ways of thinking about the topic/ issue at hand***
- go out of my way to read material related to my topic/ issue of interest***
- have been encouraged to develop my strengths and talents at my college/university**
- have a strong sense of affiliation with my college/university*
- am a part of a close and supportive community of colleagues and friends*

Researcher ratings for the "*I would like to become a professor*" item were notably higher ($t_{(5,753)} = 14.38$, $p < 0.001$) than non-researchers. Table 22 details researchers and non-researchers responses to general undergraduate dispositions items with the prompt: *because of my undergraduate experiences I feel like I...* Highlighted items in the table indicate those items that had particularly large mean differences between researcher and non-researcher ratings.

[2] * p<0.05, ** p<0.01, *** p<0.001

Table 22

Comparison of general undergraduate disposition item ratings between researchers and non-researchers

Because of my undergraduate experiences I feel like I …

Item	Researchers Mean (*SD*)		Non-researchers Mean (*SD*)		*t*-value	*df*	*p*-value
am more connected to my academic field***	4.1	(0.7)	4.0	(0.8)	3.53	5,769	<0.001
have better time-management skills	3.9	(0.8)	3.9	(0.9)	0.35	5,772	0.73
am more interested in attending graduate school***	3.9	(0.9)	3.8	(1.1)	4.78	1,236	<0.001
am more critical about people's claims***	3.9	(0.8)	3.8	(0.9)	5.25	1,119	<0.001
know what I want to do as a career	3.8	(0.9)	3.8	(1.1)	1.49	1,161	0.17
would like to become a professor***	3.0	(1.2)	2.5	(1.1)	14.38	5,753	<0.001
more often explore different ways of thinking about the topic/ issue at hand***	4.0	(0.7)	3.9	(0.8)	5.22	1,166	<0.001
go out of my way to read material related to my topic/ issue of interest***	3.9	(0.8)	3.7	(0.9)	4.77	1,128	<0.001
have a strong sense of affiliation with my college/university*	4.0	(0.8)	4.0	(1.0)	2.21	1,167	0.03
am both challenged and supported at my college/university	4.0	(0.8)	4.0	(0.9)	0.75	5,754	0.45
have been encouraged to develop my strengths and talents at my college/university**	4.0	(0.8)	3.9	(0.9)	2.59	1,147	0.01
am a part of a close and supportive community of colleagues and friends*	3.9	(0.8)	3.9	(1.0)	2.35	1,189	0.02
have something more to contribute to society	4.1	(0.7)	4.1	(0.8)	0.11	1,181	0.91
have more self-confidence	4.0	(0.7)	4.1	(0.9)	0.67	1,211	0.51
have a better understanding of myself	3.9	(0.8)	4.1	(0.9)	3.49	5,753	<0.001
can deal efficiently with unexpected events	4.0	(0.7)	4.1	(0.8)	2.17	5,752	0.03
can usually find several solutions when I am confronted with a problem	4.0	(0.7)	4.1	(0.8)	1.35	5,755	0.18
have more control over my learning	4.0	(0.7)	4.1	(0.8)	2.13	5,755	0.03
take nothing at face value and always try to dig deeper	4.0	(0.8)	4.0	(0.8)	1.94	5,754	0.05
try to understand other people's point of view	4.2	(0.7)	4.2	(0.8)	1.92	5,751	0.06
refer to knowledge I have acquired in my courses	4.2	(0.7)	4.3	(0.7)	1.61	5,754	0.11

Note. independent sample t-tests (2-tailed); * p<0.05, ** p<0.01, *** p<0.001; 5pt Likert scale (5 = Strongly agree); equal variances not assumed

Instructor Support

Study participants were asked several survey items regarding instructor support. Researchers had significantly higher ratings ($\alpha = 0.001$) on all instructor support items used in the study than non-researchers. In particular, researchers had much higher ratings for the following instructor support items ($t > 10.00$, $p < 0.00$) than non-researchers:

Item Prompt: *How often have professors/instructors provided you with …*

- Encouragement to pursue graduate/professional study
- An opportunity to work on a research project
- Advice and guidance about your educational program
- Emotional support and encouragement
- A letter of recommendation
- Honest feedback about your skills and abilities
- Feedback on your academic work (outside of grades)
- An opportunity to publish
- Help in achieving your professional goals

Table 23 details researchers and non-researchers responses to instructor support items with the prompt: *How often have professors/instructors provided you with …*. Highlighted items in the table indicate those items that had particularly large mean differences between researcher and non-researcher ratings.

Table 23

Comparison of instructor support item ratings between researchers and non-researchers

How often have professors/instructors provided you with …

	Researchers		Non-researchers				
Item	Mean	(*SD*)	Mean	(*SD*)	*t*-value	*df*	*p*-value
Encouragement to pursue graduate/professional study	4.0	(1.0)	3.2	(1.2)	19.14	1,176	0.00
An opportunity to work on a research project	3.5	(1.1)	2.4	(1.2)	25.17	5,765	0.00
Advice and guidance about your educational program	3.8	(1.0)	3.2	(1.1)	15.58	1,149	0.00
Emotional support and encouragement	3.6	(1.2)	3.1	(1.2)	12.47	5,768	0.00
A letter of recommendation	3.6	(1.3)	2.4	(1.4)	23.18	1,123	0.00
Honest feedback about your skills and abilities	3.9	(1.0)	3.4	(1.1)	12.56	1,142	0.00
Help to improve your study skills	3.5	(1.2)	3.2	(1.2)	7.87	1,078	0.00
Feedback on your academic work (outside of grades)	3.6	(1.2)	3.0	(1.2)	12.52	5,754	0.00
Intellectual challenge and stimulation	4.0	(0.9)	3.7	(1.0)	9.72	1,146	0.00
An opportunity to discuss coursework outside of class	4.1	(0.9)	3.8	(1.0)	6.07	1,153	0.00
Help in achieving your professional goals	3.7	(1.1)	3.2	(1.2)	12.27	5,755	0.00
An opportunity to apply classroom learning to "real-life" issues	3.8	(1.1)	3.4	(1.1)	7.67	5,763	0.00
An opportunity to publish	2.6	(1.4)	1.9	(1.2)	14.03	1,013	0.00

Note. 5-pt scale (5= Always; 4 = Often; 3 = Sometimes; 2 = Seldom; 1 = Never); equal variances not assumed

Research-Related Dispositions

Study participants were asked several survey items regarding their research-related dispositions. Researchers had significantly higher ratings ($\alpha = 0.001$) on all research-related disposition items in the study than non-researchers. In particular, researchers had much higher ratings for the following research-related disposition items ($t > 20.00$, $p < 0.001$) than non-researchers:

Item Prompt: *How often have professors/instructors provided you with …*

- I feel supported by my department to conduct research
- I am encouraged by my program to engage in independent research
- I feel it is important to participate in undergraduate research
- I understand how to get involved with research
- I have the time to engage in individual research
- I tend to associate with students who are involved in research

Table 24 details researchers and non-researchers responses to research-related disposition items. Highlighted items in the table indicate those items that had particularly large mean differences between researcher and non-researcher ratings.

Table 24

Comparison of research-related disposition item ratings between researchers and non-researchers

Item	Researchers Mean (*SD*)		Non-researchers Mean (*SD*)		*t*-value	*df*	*p*-value
I feel confident doing individual research/creative projects	4.1	(0.9)	3.4	(1.1)	18.04	1,217	0.00
I feel confident seeking guidance from faculty members	4.2	(0.9)	3.7	(1.0)	15.03	1,179	0.00
I feel supported by my department to conduct research	4.0	(0.9)	3.2	(1.0)	23.07	1,127	0.00
I am encouraged by my program to engage in independent research	4.0	(1.1)	3.1	(1.1)	23.10	5,761	0.00
I feel it is important to participate in undergraduate research	4.3	(0.8)	3.4	(1.0)	29.73	1,259	0.00
I understand how to get involved with research	4.2	(0.9)	2.7	(1.1)	40.49	1,255	0.00
I have the time to engage in individual research	3.7	(1.1)	2.8	(1.1)	20.08	5,761	0.00
I feel intellectually stimulated by my peers	3.9	(1.0)	3.5	(1.0)	10.38	5,758	0.00
I tend to associate with students who are highly motivated academically	4.2	(0.8)	3.9	(0.9)	11.23	5,768	0.00
I tend to associate with students who are involved in research	3.7	(1.0)	2.8	(1.0)	23.51	1,086	0.00

Note. independent sample t-tests (2-tailed); * p<0.05, ** p<0.01, *** p<0.001; 5pt Likert scale (5 = Strongly agree); equal variances not assumed

SECTION 4: PREDICTING INTEREST AND INVOLVEMENT IN RESEARCH

Our study of undergraduate research involvement among FSU students uncovered a variety of predictive variables. The subsequent analysis will employ multiple linear regression models to predict non-researcher interest in participating in research-related activities, researcher interest in continuing their participation, undergraduate perceived knowledge of research activities at FSU, participants' involvement in research, creative and senior projects and whether they worked with a mentor or faculty supervisor on research activities.

Predicting Interest in Participating in Undergraduate Research

With the following study survey items we could explain 42.2% of the variance in *interest in participating in research-related activities* among non-researchers:

- The number of FSU degree hours attempted
- Whether they applied to participate in research programs/activities (Y/N)
- Whether they were considering to pursue a Ph.D, Ed.D, or PsyD (Y/N)
- The extent that they felt that it was important to participate in undergraduate research
- The extent that they understood how to get involved with research
- The extent that they felt that they had the time to engage in individual research
- The extent that they thought about doing research
- The extent that they thought that a job as a researcher would be interesting

The extent that non-researchers felt that participating in undergraduate research was important was the strongest predictor of their interest in participating in research-related activities with a standardized beta coefficient of 0.270. Table 25 details the multiple linear regression coefficients for items used to predict interest in participating in undergraduate research activities among non-researchers.

Table 25

Predicting interest in participating in undergraduate research activities among non-researchers

Predictor	B	Beta	p-value
Number of FSU degree hours attempted	-0.003	-0.117	<0.001
Whether applied to participate in research programs/activities (Y/N)	0.537	0.143	<0.001
Whether considering pursuing a Ph.D, Ed.D, or PsyD (Y/N)	0.271	0.093	<0.001
I understand how to get involved with research	-0.169	-0.194	<0.001
I have the time to engage in individual research	0.091	0.101	<0.001
Researcher Role-Identity Items[3]:			
I feel it is important to participate in undergraduate research	0.275	0.270	<0.001
Doing research is something I rarely think about	0.200	0.233	<0.001
A job as a researcher would be interesting	0.175	0.181	<0.001
		R = 0.650 R^2 = 0.422 *n* =4,963	

Predicting Interest in Continuing Research Participation

With the following study survey items we could explain 42.5% of the variance in *interest in continuing participation in research-related activities* among participants broadly classified as researchers:

- The number of FSU degree hours attempted
- Whether they were considering pursuing a Ph.D, Ed.D, or PsyD (Y/N)
- The extent that they felt that they had the time to engage in individual research
- The extent that they thought about doing research
- The extent that they would feel a loss if they were forced to give up doing research

[3] Items responses were rated on a 5-pt Likert (5 = Strongly agree)

The extent that researchers thought about doing research was the strongest predictor of their interest in continuing their participation in research-related activities with a standardized beta coefficient of 0.264. Table 26 details the multiple linear regression coefficients for items used to predict interest in continuing participation in undergraduate research activities among broadly classified researchers.

Table 26

Predicting interest in continuing participation in research activities among researchers

Predictor	B	Beta	p-value
Number of FSU degree hours attempted	-0.005	-0.151	<0.001
Whether considering pursuing a Ph.D, Ed.D, or PsyD (Y/N)	0.297	0.123	<0.001
I feel it is important to participate in undergraduate research	0.237	0.199	<0.001
I have the time to engage in individual research	0.091	0.101	<0.001
Researcher Role-Identity Items:			
Doing research is something I rarely think about	0.238	0.264	<0.001
A job as a researcher would be interesting	0.114	0.110	<0.001
I would feel a loss if I were forced to give up doing research	0.107	0.116	<0.001
		R = 0.652 R^2 = 0.425 *n* = 1,265	

Predicting Perceived Knowledge of Research Activities

With the following study survey items we could explain 26.7% of the variance in participants' *perceived knowledge about undergraduate research programs at FSU*:

- High School GPA
- Whether they visited the OUR or attended one of their sessions (Y/N)
- How often professors provided encouragement to pursue graduate/professional study
- The extent that they understood how to get involved with research

The extent that participants understood how to get involved in research was the strongest predictor of how much they know about research activities at FSU with a standardized beta coefficient of 0.319. Table 27 details the multiple linear regression coefficients for items used to predict how much undergraduates know about research activities at FSU.

Table 27

Predicting how much undergraduates know about research activities at FSU

Predictor	B	Beta	p-value
High School GPA	0.067	0.132	<0.001
Whether they visited the OUR or attended one of their sessions (Y/N)	0.479	0.228	<0.001
How often professors provided encouragement to pursue graduate/professional study[4]	0.074	0.107	<0.001
I understand how to get involved with research	0.211	0.319	<0.001
		$R = 0.517$ $R^2 = 0.267$ $n = 6{,}588$	

Predicting Involvement in Research, Creative or Senior Projects

With the following study survey items we could explain 23.2% of the variance in whether participants *were involved in any research, creative or senior projects*:

- Number of total degree hours
- Perceived knowledge about research activities/programs at FSU
- Whether they were considering pursuing a Ph.D, Ed.D, or PsyD (Y/N)
- Whether they visited the OUR or attended one of their sessions (Y/N)
- How often professors provided opportunities to work on research projects
- The extent that they thought about doing research
- The extent that they understood how to get involved with research

[4] Items responses were rated on a 5-pt scale (5=Always; 4=Often; 3=Sometimes; 2=Seldom; 1=Never)

Number of total degree hours and the extent that participants understood how to get involved in research were the strongest predictors of whether they were involved in any research, creative or senior projects. These items could also explain 25.8% of the variance in involvement in any research, creative or senior projects among *seniors* in the sample. Table 28 details the multiple linear regression coefficients for items used to predict whether participants were involved in any research, creative or senior projects.

Table 28

Predicting whether participants were involved in any research, creative or senior projects

Predictor	B	Beta	p-value
Number of total degree hours	0.002	0.192	<0.001
How much they know about research activities at FSU	0.060	0.119	<0.001
Whether considering to pursue a Ph.D, Ed.D, or PsyD (Y/N)	0.086	0.080	<0.001
Whether they visited the OUR or attended one of their sessions (Y/N)	0.085	0.080	<0.001
How often professors provided opportunities to work on research projects	0.038	0.114	<0.001
I understand how to get involved with research	0.054	0.162	<0.001
Researcher Role-Identity Item:			
Doing research is something I rarely think about	0.033	0.100	<0.001
		$R = 0.482$ $R^2 = 0.232$ $n = 6,283$	

Predicting Whether Undergraduates worked with a Mentor or Faculty on Research

With the following study survey items we could explain 25.7% of the variance in whether participants *worked with a mentor or faculty supervisor on research activities*:

- Number of total degree hours
- Perceived knowledge about research activities/programs at FSU

- Whether they were considering to pursuing a Ph.D, Ed.D, or PsyD (Y/N)
- Whether they visited the OUR or attended one of their sessions (Y/N)
- How often professors provided opportunities to work on research projects
- The extent that they thought about doing research
- The extent that they understood how to get involved with research

The extent that participants understood how to get involved in research and how much they knew about research activities at FSU were the strongest predictors of whether participants worked with a mentor or faculty supervisor on research activities. These items could also explain 31.6% of the variance in involvement in any research, creative or senior projects among *seniors* in the sample. This was the same regression model used previously to predict whether participants were involved in any research, creative or senior projects. Table 29 details the multiple linear regression coefficients for items used to predict whether participants worked with a mentor or faculty supervisor on research activities.

Table 29

Predicting whether participants worked with a mentor/faculty on research activities

Predictor	B	Beta	p-value
Number of total degree hours	0.001	0.130	<0.001
How much they know about research activities at FSU	0.075	0.160	<0.001
Whether considering to pursue a Ph.D, Ed.D, or PsyD	0.108	0.107	<0.001
Whether they visited the OUR or attended one of their sessions	0.122	0.125	<0.001
How often professors provided opportunities to work on research projects	0.031	0.099	<0.001
I understand how to get involved with research	0.051	0.165	<0.001
Researcher Role-Identity Item:			
Doing research is something I rarely think about	0.031	0.099	<0.001
		$R = 0.508$ $R^2 = 0.257$ $n = 6{,}283$	

SECTION 5: SUMMARY

This study of undergraduate research involvement at FSU was able to gather information from 24.3% of undergraduates (7,469) enrolled during the spring 2013 semester. Although the study sample included more women and seniors than expected, it appears to be a reasonable representation of the population of FSU undergraduates. The vast majority (75.5%) of study participants indicated that they were involved in at least one academic club or student organization and most participants indicated that they were considering pursuing at least a Master's degree (54.9%).

Many participants indicated that they had either little knowledge (40.9%) or some knowledge (38.9%) of undergraduate activities and programs at FSU. This perceived knowledge of research activities at FSU had a moderate positive correlation ($r = 0.35$, $p < 0.001$) with whether study participants visited the Office of Undergraduate Research (OUR) or attended one of their information sessions; 18.2% of participants visited the OUR or attended one of their information sessions.

Perceived knowledge of research activities at FSU did not differ by gender but varied among race/ethnicity, academic classification, FSU academic college, and academic field groupings. On average Asian/Pacific Islander students perceived to know more about research activities at FSU than all other race/ethnicity groups; Hispanics/Latinos more than White/Caucasian students. Seniors perceived to know more about research activities at FSU than juniors, sophomores and freshmen. Students from the College of Arts and Sciences perceived to know more about research activities at FSU than all other academic colleges. Physical and Life sciences majors perceived to know more about research activities at FSU than all other academic fields; Social and Behavioral sciences majors more than Business, Education and Computational sciences majors.

In an effort to gather the most information regarding undergraduates' involvement in research activities and the type of activities that they were involved in, we broadly and narrowly defined research. Broadly defined research involvement was whether participants were involved in *any research-related, creative, and/or senior-level projects*; narrowly defined research involvement was whether participants *worked with a mentor or faculty supervisor on research-related activities*. Both definitions were useful for the assessment of undergraduate research experiences gained not only through guidance received from research mentorship but also through research-relevant efforts employed in creative and senior-level projects.

There were 1,720 study participants that could be broadly classified as researchers (i.e., involved in research, creative or senior projects); 56.2% of them also indicated that they worked with a mentor or faculty supervisor on research activities. There were 1,287 study participants that could be narrowly classified as researchers (i.e., worked with a mentor or faculty supervisor on research activities); 75.1% of them also indicated that they were involved in research, creative or senior projects. These classifications were highly positively correlated ($r = 0.56$, $p = 0.00$).

There was a 23.3% involvement in research, creative or senior-level projects among study participants, and no significant gender differences in this broadly defined research involvement. Participation in research, creative or senior projects did not vary among race/ethnicity groupings; however, there were greater percentages of Asian/Pacific Islander students (28.8%) than Black/African American (20.6%) or Hispanic/Latino (22.0%) students broadly involved in research.

Participation in research, creative or senior projects did vary among academic classification, FSU academic college, and academic field groupings. More seniors and juniors participated in research, creative or senior projects than sophomores and freshmen. Seniors had

the largest percentage of participants (33.2%); freshmen had the smallest (10.5%). The FSU College of Engineering had the greatest percentage of participants that were involved in research, creative or senior projects (38.4%); the College of Business had the lowest (11.3%). Physical sciences fields had the highest percentage of participants that were involved in research, creative or senior projects (38.7%); Business fields had the lowest (11.3%).

A narrow definition of research involvement indicated that 17.5% of study participants worked with a mentor or faculty supervisor on research-related activities. There were no gender differences in this narrowly defined conceptualization of research involvement. However, the percentage of participants that worked with a mentor or faculty supervisor on research activities varied among race/ethnicity, academic classification, FSU academic college, and academic field groupings.

Asian/Pacific Islander students had the greatest percentage of study participants that worked with a mentor or faculty supervisor on research activities (27.4%); Black/African American students had the lowest (14.2%). There were greater percentages of Asian/Pacific Islander students narrowly classified as researchers than all other race/ethnicity groupings. Fewer Black/African American students worked with a mentor or faculty supervisor on research activities than White/Caucasian students.

Greater percentages of seniors worked with a mentor or faculty supervisor on research activities than juniors, sophomores or freshmen. Seniors had the highest percentage of participants (24.5%); freshmen had the lowest (7.9%). The FSU College of Arts and Sciences had a greater percentage of participants that worked with a mentor or faculty supervisor on research activities than all other academic colleges. The College of Arts and Sciences had the highest percentage of participants (31.6%); the College of Motion Picture Arts had the lowest

(0.0%) followed by the College of Education (6.1%) and the College of Business (7.2%). Physical and Life sciences fields had greater percentages of participants that worked with a mentor or faculty supervisor on research than all other academic fields. Physical sciences fields had the highest percentage of participants (39.8%); Education fields had the lowest (5.8%).

Of the 1,720 study participants that were involved in research, creative or senior projects, 34.9% indicated that they participated in Directed Independent/Individual Study (DIS), followed by 28.9% in research or creative projects as part of their course, and 25.9% in research method course(s). Research Experiences for Undergraduates (REU) programs had the lowest (2.6%) participation. The vast majority of participants that were involved in research, creative or senior projects (75.9%) indicated that they talked to their family and friends about their research or creative projects. Many (43.4%) presented their research or creative projects in a class, seminar or departmental presentation. Less than 3% of participants published their research or creative projects, or presented at a graduate or professional level symposium.

Participants that were involved in research, creative and senior projects also indicated the academic year (i.e., 1st year, 2nd year, 3rd year, and 4th+ year) that they began their involvement; 77% of them began their involvement in research before their 4th year of undergraduate work. Although most undergraduate researchers began their research involvement before their 4th year of undergraduate work, evidence also suggests that the time period when most undergraduates elect to get involved in research is from junior to senior year. Further longitudinal analyses are necessary to verify this assumption.

Study participants that were broadly classified as researchers were asked a variety of questions that assessed confidence in research-relevant abilities attributed to research and non-research experiences. All survey items assessing confidence in research-relevant abilities of

participants involved in research, creative or senior projects showed higher confidence ratings attributed to experiences gained through research than non-research experiences. In particular, confidence in ability to observe and collect data, conduct a research or creative project using methods appropriate to the field of study, and analyze and interpret data was most attributed to experiences gained through research. Likewise, participants most attributed how comfortable they felt discussing research and how connected they felt to their academic field to experiences gained through research involvement.

For analyses comparing *researchers* and *non-researchers*, only study participants that could be *both* broadly and narrowly classified as researchers were assessed as the "researcher group". Participants that had *not* been involved in research, creative or senior projects and *never* worked with a mentor or faculty supervisor on research activities were classified as the "non-researcher group". On average researchers had higher cumulative college GPAs, high school GPAs, SAT and ACT scores, more total degree hours, and higher FAFSA-reported annual family incomes than non-researchers. The annual family income of study participants was not markedly correlated with research involvement whether broadly defined ($r = 0.03$, $p = 0.01$) or narrowly defined ($r = 0.03$, $p = 0.03$).

Many *non-researchers* indicated that they were either moderately interested (25.2%) or somewhat interested (36.5%) in participating in research-related activities. Among non-researchers, men were more interested in participating in research-related activities than women. Asian/Pacific Islander and Hispanic/Latino students were more interested in participating in research activities than Black/African American and White/Caucasian students. Sophomores were more interested than juniors and seniors; freshmen more than seniors but less than sophomores. Physical sciences, Life sciences, and Engineering majors were more interested in

participating in research activities than all other academic fields; Arts, Education, and Business majors were less interested than all other academic fields except Computational sciences fields. Very few non-researchers (6.9%) had ever applied to participate in any undergraduate research activities or programs. Of these research opportunities that non-researchers applied to participate, DIS and UROP were the most popular.

Among r*esearchers,* most indicated that they were either very interested (47.8%) or moderately interested (23.0%) in continuing their participation in research, and level of interest was similar for women and men. Researchers' interest in continuing their participation in research did not vary among race/ethnicity. Sophomores and juniors were more interested in continuing their participation in research than seniors and freshmen. Physical and Life sciences majors were most interested in continuing their participation in research. Business, Education and students classified Undecided/Undeclared majors were least interested in continuing their participation in research.

As expected, researchers had moderate to high ratings on all researcher role-identity salience items. In particular, researchers had much higher ratings than non-researchers for how they perceived their involvement in research as being important to how others viewed them, and the extent to which they actually thought about doing research. They also had higher ratings on all instructor support items used in this study. In particular, researchers had much higher ratings for how often they were provided with encouragement to pursue graduate and/or professional study, a letter of recommendation, and an opportunity to work on a research project.

Moreover, researchers had higher ratings on many general undergraduate disposition items. They felt more connected to their academic field, more interested in attending graduate school, more inclined to want to become a professor, were more critical of other people's claims,

and more often explored different ways of thinking about topics or issues than non-researchers. They also had higher ratings on all the more research-related disposition items used in this study than non-researchers. In particular, researchers had much higher ratings for how encouraged they felt by their program to engage in research, how important they felt participating in research was, whether they felt that they had the time to engage in research, and most notably on the extent to which they felt that they understood how to get involved in research.

The extent to which participants felt that they understood how to get involved in research was the strongest predictor of whether participants were involved in research whether broadly or narrowly defined. The following predictors could explain 23.3% of the variance in *whether participants were involved in research, creative or senior projects*, and 25.7% of the variance in whether participants *worked with a mentor or faculty supervisor on research activities*:

- Number of total degree hours
- Perceived knowledge about research activities/programs at FSU
- Whether they were considering to pursuing a Ph.D, Ed.D, or PsyD
- Whether they visited the OUR or attended one of their sessions
- How often professors provided opportunities to work on research projects
- The extent that they thought about doing research
- The extent that they understood how to get involved with research

Furthermore, these items could explain 31.6% of the variance in whether *seniors* ever worked with a mentor or faculty supervisor n research activities.

We also found strong predictors for participants' perceived knowledge about research activities and their interest in participating or continuing their participation in research activities. The following predictors could explain 26.7% of the variance in participants' *perceived knowledge about undergraduate research programs at FSU*:

- High School GPA
- Whether they visited the OUR or attended one of their sessions (Y/N)
- How often professors provided encouragement to pursue graduate/professional study
- The extent that they understood how to get involved with research

The extent that participants understood how to get involved in research was also the strongest predictor of how much participants knew about research activities at FSU.

Among non-researchers (i.e., had no involvement in research, creative or senior projects and never worked with a mentor or faculty supervisor on research activities) the following predictors could explain 42.2% of the variance in their *interest in participating in research-related activities*:

- The number of FSU degree hours attempted
- Whether they applied to participate in research programs/activities
- Whether they were considering to pursue a Ph.D, Ed.D, or PsyD
- The extent that they felt that it was important to participate in undergraduate research
- The extent that they understood how to get involved with research
- The extent that they felt that they had the time to engage in individual research
- The extent that they thought about doing research
- The extent that they thought that a job as a researcher would be interesting

The extent that non-researchers felt that participating in undergraduate research was important was the strongest predictor of their interest in participating in research-related activities.

Among participants that were involved in research, creative or senior projects the following predictors could explain 42.5% of the variance in their *interest in continuing participation in research-related activities*:

- The number of FSU degree hours attempted
- Whether they were considering pursuing a Ph.D, Ed.D, or PsyD (Y/N)

- The extent that they felt that they had the time to engage in individual research
- The extent that they thought about doing research
- The extent that they would feel a loss if they were forced to give up doing research

The extent that researchers actually thought about doing research was the strongest predictor of their interest in continuing their participation in research-related activities.

SECTION 6: CONCLUSION

For this report we concentrated on five main questions: 1) what proportion of FSU undergraduates are involved in research-related activities, 2) how interested are undergraduates in participating or continuing their participation in research, 3) how knowledgeable are undergraduates of research opportunities at FSU, 4) how does involvement in research affect undergraduates' attitudes and dispositions, and 5) what are some predictors of whether undergraduates are involved in research activities.

We can estimate that between 17.5% to 23.3% of undergraduates at FSU are involved in research-related activities. By senior year we estimate that 24.5% of undergraduates have worked with a mentor or faculty supervisor on a research-related project, and 33.2% have been involved in some form of research, creative or senior project. Undergraduates in Physical and Life sciences fields are most likely to engage in research activities; Education and Business fields are least likely to engage in research activities.

In general, undergraduates that *have not* participated in any research-related activities indicate that they are moderately to somewhat interested in participating, but have only little to some knowledge of the research opportunities available to them at FSU. Undergraduates that *have* participated in research-related activities indicate that they are very to moderately interested in continuing their participation in research. On average these undergraduate researchers have more favorable ratings regarding general and research-related attitudes, researcher identification, and instructor support, and higher scores on measures related to undergraduate success (i.e., GPA, ACT and SAT scores) than those that have not been involved in research.

Understanding how to get involved in research-related activities and perceived knowledge of research-related opportunities are both strong predictors of undergraduate research

involvement. Results from this study suggest that increasing undergraduates' awareness of research opportunities at FSU as well as their understanding of how to get involved in research, especially among underclassmen, should increase undergraduates' involvement in research-related activities and programs. Through support and encouragement from instructors and the university, undergraduates can become more knowledgeable of the value attributed to involvement in research-related activities and more likely to participate in undergraduate research.

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