

University of Northern Colorado

## Scholarship & Creative Works @ Digital UNC

---

University Libraries Faculty Publications

University Libraries

---

4-3-2020

### Undergraduate Student Success and Library Use: A Multimethod Approach

Jennifer Mayer

*University of Northern Colorado*, [jennifer.mayer@unco.edu](mailto:jennifer.mayer@unco.edu)

Rachel Dineen

[rachel.dineen@unco.edu](mailto:rachel.dineen@unco.edu)

Angela Rockwell

*University of Northern Colorado*, [angela.rockwell@unco.edu](mailto:angela.rockwell@unco.edu)

Jayne Blodgett

*University of Northern Colorado*, [jayne.blodgett@unco.edu](mailto:jayne.blodgett@unco.edu)

Follow this and additional works at: <https://digscholarship.unco.edu/libfacpub>



Part of the [Library and Information Science Commons](#)

---

#### Recommended Citation

Mayer, Jennifer; Dineen, Rachel; Rockwell, Angela; and Blodgett, Jayne, "Undergraduate Student Success and Library Use: A Multimethod Approach" (2020). *University Libraries Faculty Publications*. 96.  
<https://digscholarship.unco.edu/libfacpub/96>

This Article is brought to you for free and open access by the University Libraries at Scholarship & Creative Works @ Digital UNC. It has been accepted for inclusion in University Libraries Faculty Publications by an authorized administrator of Scholarship & Creative Works @ Digital UNC. For more information, please contact [Jane.Monson@unco.edu](mailto:Jane.Monson@unco.edu).

# Undergraduate Student Success and Library Use: A Multimethod Approach

Jennifer Mayer, Rachel Dineen, Angela Rockwell, and Jayne Blodgett

How libraries affect student success has become an increasingly important question to many academic librarians. To investigate this phenomenon, we explored student success via two approaches in this multimethod study: 1) through individual student interviews to capture the student voice; and 2) through hierarchical linear and logistic modeling of institutional data to capture the institutional perspective. Through the qualitative component, students articulated how they define success and how the library contributes to their success, especially in terms of providing a sense of belonging and facilitating the work of a community of scholars. The quantitative data provides additional context by demonstrating a small positive correlation between use of library resources and student persistence, further highlighting the community building impact of the libraries.

## Introduction

We convened a research team in 2017 consisting of two librarians, a data analyst, and a library administrator to investigate what role, if any, the library plays in undergraduate students' success. We specifically examined whether correlations exist between library services and student persistence. Our study considered students who enrolled in fall 2017, enrolled for classes again in fall 2018, or completed a bachelor's degree in fall 2017 or later but before fall 2018. Our research questions were:

- How does use of specific library services correlate to persistence for undergraduate students?
- Is there a positive correlation between the number of uses of library services and academic achievement for undergraduate students?
- How does use of library services correlate to academic achievement for undergraduate students?

---

*\*Jennifer Mayer is Associate Professor, Head of Library Research Services; Rachel Dineen is Assistant Professor, Information Literacy and Undergraduate Support; Angela Rockwell is Data Analyst & Report Writer; and Jayne Blodgett is Assistant Dean of Libraries, all at University of Northern Colorado; email: jennifer.mayer@unco.edu, rachel.dineen@unco.edu, angela.rockwell@unco.edu, jayne.blodgett@unco.edu. The authors thank Lyda McCartin, a former University Libraries colleague, for her contributions as project originator and member of the original research team. We also thank our reviewers, Michelle Demeter and Tony Stamatoplos, both of whom provided invaluable feedback on our manuscript during the open review and revision process for this special issue of College & Research Libraries. ©2020 Jennifer Mayer, Rachel Dineen, Angela Rockwell, and Jayne Blodgett, Attribution-NonCommercial (<https://creativecommons.org/licenses/by-nc/4.0/>) CC BY-NC.*

The study evolved to include a qualitative piece that addresses the following additional research questions:

- How do students define academic success?
- What role can or does the library play in student academic success?

In our research, we found that in much of the literature of academic libraries and higher education, the terms “academic success” and “student success” are often used interchangeably. We also found that these concepts are incredibly difficult to define because they are influenced by a myriad of factors<sup>1</sup> and have the potential to vary depending on the interested party.<sup>2</sup> Therefore, for the purposes of this article, we will use the phrase “student success” to describe a collection of factors that include academic achievement (GPA), acquisition of desired skills and competencies, persistence from one year to the next, and personal satisfaction and achievement (as determined by students).<sup>3</sup> While measures such as postcollege performance and attainment of educational objectives could prove to be important metrics for student success, they are beyond the scope of this research study.

We view this multimethod research project as a way to inform strategies for improving how the library contributes to student success. Despite the recent national trend of an increased pressure from institutional administrations to demonstrate the value of library services in academia, this study was proactively conceived by librarians, three years before a formal student success initiative was unveiled at our university. Our motivation has been, and continues to be, improving library resources and services for our community. Our project also coincides with a university strategic enrollment and student success initiative. Through active involvement in this initiative, we plan to communicate our findings to the university community and use them to help inform larger, student-centered decisions. By including one-on-one student interviews in addition to quantitative data, we believe that sharing the students’ personal opinions about success and the library provides a unique perspective in the growing body of literature on library value studies. Although our findings are for our local organization, the methods of our study are scalable to other institutions in a number of ways detailed in this article; others could implement this multimethod approach, collaborate with a data analyst, map to their institutions’ student success initiatives, or integrate a qualitative piece to include the student voice in the findings.

### ***University Context and Student Success Initiative***

The University of Northern Colorado (UNC) is a regional public university holding the Carnegie classification of Doctoral/Professional University. UNC’s spring 2019 undergraduate enrollment was: 8,854 total undergraduates enrolled, 42 percent of whom are first-generation college students; 31 percent are Pell grant eligible; and 65 percent are female.<sup>4</sup> The first-generation and Pell grant demographics were important to include in our quantitative study because many UNC students are members of those groups. Counting graduate students, UNC’s total student enrollment in spring 2019 was 11,949. In FY2019, the university libraries, both the James A. Michener Library and the Howard M. Skinner Music Library, were visited by 516,250 people, and staff checked out 71,653 physical items. The university libraries have a total of 131 desktop computers and 17 laptops available for student use. Michener Library has the largest consolidation of computers on the university campus. During the 2019 fiscal year, librarians taught nine credit-bearing information literacy courses, facilitated 315 individual “one-shot” instruction sessions, and provided 263 research consultations. During the fall 2018 and spring

2019 semesters, Michener Library was open 107 hours a week. The university libraries are committed to improvement through continual librarywide and departmental assessment of our resources and services. In addition to having an assessment committee, which focuses on a different year-long project each academic year, including conducting LibQual+® every three years, individual departments conduct their own assessment projects to improve instruction and curriculum, services, resources, and library space.

In 2018, UNC convened a steering committee to create the Strategic Enrollment and Student Success Plan (SESS). The SESS vision states that UNC “leverages its teacher/scholar model and integrated network of coaching and support resources to attract and provide students with the education, experiences, and opportunities they need to succeed and achieve their desired outcomes.”<sup>5</sup> The SESS plan defines the “pillars” of student success as: academic ability; financial capability; sense of belonging; and wellness.<sup>6</sup> Guiding goals of the SESS plan include 78 percent first-year retention by 2023, 38 percent 4-year graduation rate, and 58 percent 6-year graduation rate.<sup>7</sup> At a March 2, 2018, University of Northern Colorado board of trustees meeting, UNC Senior Vice President and Chief Financial Officer Michelle Quinn shared that the best comparator for student retention is the fall-to-fall retention rate, which was used in our study.

UNC’s SESS plan has four goals, three of which focus on different areas of improvement related to persistence and graduation rates. The library can and should play an important part in helping the university achieve those goals. By using a multimethod research strategy, we can see the role the library plays in both student success at the macro level (such as persistence and GPA), focusing on the library’s academic-related work, while the feedback allows us to explore individual student responses, which often relate more to the student-support side of the library’s work (like providing a safe, welcoming space for a community of scholars that is often open for extended study hours past midnight). By combining the two approaches, the library can better respond to student needs in a holistic manner.

## Literature Review

Dating back several decades, there is an expansive array of literature in higher education focused on student persistence and student success. Vincent Tinto made several observations about student success in his 2013 South African lectures at the Regional Symposia Council on Higher Education that illustrate this is an area of global concern. In his Lecture 2, “Access without Support Is Not Opportunity,” Tinto discusses the “necessity of access and support to enable students to succeed in the university.”<sup>8</sup> In a study focused on the effects of student engagement on first-year college students’ grades and persistence, George D. Kuh, Ty M. Cruce, Rick Shoup, Jillian Kinzie, and Robert M. Gonyea reached two main conclusions. First, they determined that student engagement in “educationally purposeful activities” has a positive impact on grades and persistence from first to second year.<sup>9</sup> The second conclusion was that exposure to effective educational practices benefits all students, but especially lower-ability students and students of color.<sup>10</sup> In their study, Kimberly Martin, Richard Galentino, and Lori Townsend interviewed community college graduates as well as faculty and staff from the same institution.<sup>11</sup> They found that underpreparedness can be overcome by a motivated student and suggest researching the effect of the impact that successful students have on other students by asking, “could the characteristics of successful students rub off on others?”<sup>12</sup>

There is a significant body of published library value studies in the literature and the number grows each year, especially given the attention Association of College & Research Libraries' (ACRL) 2010 *Value of Academic Libraries (VAL): A Comprehensive Research Review and Report*<sup>13</sup> has received. Although the VAL agenda includes suggested study areas that are quantitative in nature, there is also a recommendation to study qualitative factors, such as student experience, attitude, and perception of quality. ACRL's *Academic Library Impact: Improving Practice and Essential Areas to Research* supplied additional ideas on library value studies and included a study featuring semistructured interviews of provost views on the value of the libraries.<sup>14</sup>

Although a handful of these research studies do contain some discussion of the affective components of library value, many of the studies that have been conducted focus more on quantifiable data, such as student retention and grade point average (GPA).<sup>15</sup> Researchers at the University of Minnesota have been prolific in publishing on their research of library value.<sup>16</sup> These value studies at Minnesota, the University of Wyoming, James Madison University, Murray State University, Curtin University, and Nevada State College consistently note convincing correlations between a variety of library services (instruction, research consultations, use of print or online resources, or workstation use) and student persistence, GPA, and academic engagement. Angie Thorpe, Ria Lukes, Diana J. Bever, and Yan He, the authors of a 2016 study on library use and student success, found there was an association between library services and higher GPAs and retention rates.<sup>17</sup> However, the authors had lingering questions around student motivators for using the library and effects of external factors on student success, and recommended added qualitative research strategies to help shed light on these areas of inquiry.<sup>18</sup> Several studies note that, although library use did have a correlation to higher GPA and retention rates, there is a need for more nuanced forms of measuring library usage to tell the complete story.

Some concerns exist regarding the increased pressure to demonstrate the value of the library to university administrations. In their recent meta-analysis, M. Brooke Robertshaw and Andrew Asher argue that many of these studies are statistically not convincing. They contend that findings of the studies, at their statistical face-value, support an argument that libraries are contributing very little to overall student success.<sup>19</sup> Beyond this, some in the profession point to the many other factors impacting student retention and GPA. Acknowledging that the privilege (zip code, income, race, and inheritance) of the student can be a key contributor to success, Zoe Fisher made a plea to find out what students really need from an academic library to be successful in college.<sup>20</sup> Fisher also raised the serious concern about student data privacy related to these types of studies.

As we developed our research study, we were conscious of the concerns raised by Robertshaw and Asher and Fisher. The quantitative piece of our study features a combination of both logistic and linear hierarchical regression, which is unusual in the library research literature.<sup>21</sup> Hierarchical regression is only referenced in four articles published in *College & Research Libraries*, none of which explored binary dependent variables.<sup>22</sup> Hierarchical regression is similar to other regression model building procedures in that the individual contributions of variables are estimated; its particular strength comes from the variables being added to the model at the discretion of the researcher, generally following a formal or informal theory, so that the researcher can estimate the distinct additional contribution of a group of purposefully selected variables as a unit. This technique is likely underused in the literature because researchers are unaware of the relative weakness of conclusions drawn

from models developed using the stepwise selection method and its variants compared to those developed using theory to guide variable selection through hierarchical regression. Hierarchical regression also addresses the weakness of using an all-in model, which, because of intercorrelations between variables, cannot be used to estimate the unique contribution of a group of variables to the model. In addition to this quantitative analysis of student success, the student interviews gave us insight into the complex needs of our student population. We provide the steps taken to protect student privacy in both the quantitative and qualitative components of this study.

## Methods

Using a multimethod approach allowed us to look at student success in the aggregate and better understand the impact of library resources and services to the student body at large, while the individual interviews gave us perspective on the role of the library at the individual level. Examining the results of two different types of data gave us a more holistic picture of what the library is doing well and where we need to improve.

### *Quantitative*

The quantitative data included in this analysis are library use data and student demographic and academic data for all degree-seeking undergraduates enrolled at UNC in the fall 2017 semester. Use of institutional data in the application for the quantitative section of this study was considered exempt by our Institutional Review Board (IRB), and we also received approval from the Registrar, the Dean of University Libraries, and the Chief Information Officer to use the data. Four categories of library data were gathered: physical item checkout; use of library computers; instruction sessions attended; and research consultations. These categories represent library resources and services that are easily associated with patron information. Similar studies include the use of e-resources, but because of how the EZProxy server at UNC is supported, we were not able to gather information about off-campus access of e-resources. This created a gap in our analysis, but the analysis was sufficiently comprehensive to answer our questions without that data. To protect the privacy of our students, all raw data files as well as the anonymized SPSS reports are stored in the research group's OneDrive folder, which is the campus's secure storage location. In addition to the library data gathered, data from the campus data repository Banner was used. Only the institutional research member of the group has access to the Banner data.

The additional factors gathered for analysis were first-generation status (neither parent has earned a bachelor's degree), gender, Pell grant eligibility, pre-fall GPA, underrepresented minority status, student classification, housing status (on- vs. off-campus), participation in a TRIO program (a federally funded group of programs that support students from underrepresented backgrounds in the pursuit of a college degree), and participation in UNIV 101, a college preparedness course. For students whose first term at UNC was fall 2017, and therefore had no institutional GPA for the analysis, we used the student's high school GPA or the most recent transfer institution GPA for transfer students. We did not include major in the quantitative analysis for three reasons: 1) some majors have so few students that, if we included student's major, the calculations would create unstable estimates; 2) the equation would suffer from lack of parsimony; and 3) students in lower enrollment majors would be identifiable, thus violating research ethics.

Initially, a demographic use analysis of library services was generated. While this offered insight into who used the library, it did not offer any correlative information. Using SPSS (v. 25), we ran hierarchical regression models using library resource and service use to explain persistence and spring 2018 cumulative GPA. In hierarchical regression, the researcher purposefully adds variables into a model in distinct steps to calculate the relative change in model fit with each additional variable. We entered all the control variables in step 1 for the analyses; in step 2, we added in the library use variables of interest to measure their unique contributions to the models. We found that gender, Pell grant eligibility, and UNIV101 participation variables provided no additional statistically significant explanatory power to either the persistence model or the spring 2018 cumulative GPA model, so we excluded them in the interest of parsimony. We used dummy coding for the categorical variables so that 1 indicated presence of the attribute and 0 indicated absence. For the student classification variable, we created three variables for the freshman through junior classifications, contrasting them with the senior classification. The outcome variables were whether the student persisted in the first model and their spring cumulative GPA in the second model.

### *Qualitative*

For the qualitative component of our study, we conducted 17 face-to-face, semistructured interviews with current UNC undergraduate students. As mentioned above, the research team determined semistructured interviews would better allow us to understand students' experiences with and perceptions of the library, which we felt we could not observe or obtain through other methods.<sup>23</sup> The interview questions centered on if, how, and why the students used the library (see appendix for the interview questions). We piloted the questions with three undergraduate student library employees to test for clarity and effectiveness. We made revisions based on the pilot. Because of the semistructured nature of the interviews, researchers were able to ask students follow-up questions to clarify or probe further into answers given.<sup>24</sup>

To recruit participants for our study, researchers used multiple communications strategies. The office of Institutional Reporting and Analysis Services (IRAS) provided a list of email addresses for a randomly selected group of undergraduate students who were sent an email. We also made recruitment flyers that were hung in various academic and public buildings around campus, allowing students the opportunity to self-select into the study by contacting one of the researchers directly. Participants were offered a \$10 gift card to thank them for their feedback.

The only criterion that students had to meet to participate was to be a current undergraduate student. All our interviewees were at least 18 years of age and signed a consent form before the interview began. The only demographic information gathered was their year in school and their area of study. We made the decision not to gather other demographic factors, such as race, gender, or Pell-grant eligibility to protect the privacy of the small sample size. Furthermore, because these demographic factors did not add any correlative significance to the quantitative findings, we felt that gathering this information from our interviewees was unnecessary. The interview participants represented a variety of majors and academic levels.

To analyze the 17 student interviews, we used a qualitative, inductive coding method to identify major themes. With student consent, we recorded audio of the interviews and used the program Temi to transcribe audio to text to assist with analysis. Two researchers took part in the analysis to ensure accuracy in our interpretations. We developed a thematic analysis

process to capture the essence of the students' answers to our interview questions that mapped to the overarching purpose of our study.<sup>25</sup> To ensure our data analysis was sensitive to our interviewees' feelings and experiences, we used a combination of Descriptive and In Vivo coding techniques that incorporated students' words and researcher-developed terms.<sup>26</sup> We then sorted each code into larger thematic groups.

## Findings

### *Student Persistence, Grade Point Average, and Library Use*

During fall 2017 and spring 2018, 76 percent of UNC degree-seeking undergraduate students who started school in fall 2017 used some library resource or service. A higher proportion of students of color used the library (80%) compared to those students who identified as white (75%). Library use was slightly higher for Pell grant-eligible students (79%) than for noneligible students (74%). Sophomores were the highest users by classification at 83 percent, and seniors were the lowest at 65 percent. The low usage of library resource and services among seniors may be an artifact of not including electronic resource activity in the analysis.<sup>27</sup> While the demographic use information was helpful in better understanding who was using the spaces, services, and resources available, those data did not answer our research questions about library use and its relationship to persistence. The logistic regression analysis showed all but the research consultation variables were statistically significant, and use of each library service or resource was associated with an increase in persistence. The relative odds of persisting differ little for the control variables across the models, except for participation in a TRIO program. TRIO program participation had the highest odds ratio across all models, varying from a 455 to a 590 percent higher chance of persisting in the single library service or resource model and the number of library instruction sessions model, respectively. The likelihood of persisting increased in all three models with higher student classification or with higher academic standing as measured by pre-fall cumulative GPA. Importantly, after accounting for the contributions of these known predictors, all of the library use variables were associated with increased odds of persisting, although participating in a research consultation was not statistically significant. This lack of significance is likely due to so few students in the sample having used this service.

For the services that were statistically significant, checking out an item is associated with a 124 percent higher probability of persisting; logging in to a computer or participating in an instruction session are associated with 50 and 89 percent higher probability of persisting, respectively. The results of this model demonstrate that use of library resources and services increases the probability of a student persisting.

The second model investigated the impact of the number of distinct library resources and services used on persistence to address the relationship between the number of library services used and academic success. For each new library service or resource a student used, there was a 78 percent increase in the probability of the student persisting. Also, when considering the relative impact of multiple instruction sessions, the probability of persisting increases by 30 percent for each additional instruction session the student participated in.

The models explaining spring 2018 GPA show that, after accounting for the control variables, library resource and service use correlates with the minimal positive effect on end-of-year GPA. Our large quantitative sample has sufficient power to identify smaller, but still statistically significant, effect sizes that are important because they illustrate the contribution toward academic success of library use as a distinct behavior. Because libraries are integral to



**TABLE 1**  
**Hierarchical Logistic Regression Coefficients for Three Library Service and Resource Use Models Explaining Persistence (N = 9,006)**

	Step 1				Step 2: Individual Services and Resources				Step 2: Number of Distinct Services				Step 2: Number of Instruction Received			
	B	S.E.	Wald	OR	B	S.E.	Wald	OR	B	S.E.	Wald	OR	B	S.E.	Wald	OR
Underrepresented Minority	-.13	.07	3.95	.88*	-.18	.07	7.26	.84**	-.19	.07	7.98	.83**	-.13	.07	3.94	.88*
First-Generation	-.30	.06	22.46	.74***	-.28	.06	19.95	.75***	-.28	.06	19.83	.75***	-.29	.06	21.27	.75***
Freshman	-1.69	.10	291.13	.19***	-1.87	.10	333.64	.16***	-1.87	.10	338.06	.15***	-1.80	.10	324.36	.17***
Sophomore	-.72	.10	50.56	.49***	-.90	.10	75.56	.41***	-.92	.10	79.13	.40***	-.75	.10	55.23	.47***
Junior	-.36	.10	11.61	.70**	-.45	.11	18.38	.64***	-.46	.11	19.05	.63***	-.36	.11	11.96	.70**
Pre-Fall Cumulative GPA	.42	.04	91.88	1.52***	.42	.05	85.40	1.52***	.43	.05	94.14	1.54***	.41	.04	84.62	1.50***
Univ Housing	.19	.07	6.63	1.21*	.06	.08	.66	1.06	.08	.08	1.14	1.09	.16	.08	4.81	1.18*
TRIO	2.24	.59	14.31	9.40***	1.71	.60	8.28	5.55**	1.73	.60	8.44	5.62**	1.93	.59	10.60	6.90**
Checked Out at Least One Book					.81	.09	85.39	2.24***								
Logged In to a Computer at Least Once					.40	.06	42.29	1.50***								
Participated in at Least One Instruction Session					.64	.07	82.53	1.89***								
Received at Least One Research Consult					.68	.61	1.24	1.97								
Number of Distinct Services									.58	.04	231.52	1.78***				
Number of Instruction Sessions Participated In													.26	.03	57.22	1.30***
Constant	1.28	.16	63.88	3.58***	.91	.17	29.46	2.48***	.81	.17	24.27	2.25***	1.26	.16	61.40	3.51***

\*P < .05; \*\*P < .01; \*\*\*P < .001

**TABLE 2**  
**Hierarchical Linear Regression Coefficients for Variables of Three Library Service and Resource Use Models Explaining Spring 2018 Cumulative GPA (N = 9,006)**

	Step 1			Step 2: Individual Services and Resources			Step 2: Number of Distinct Services			Step 2: Number of Instruction Received		
	B	S.E. B	β	B	S.E. B	β	B	S.E. B	β	B	S.E. B	β
Underrepresented Minority	-.099	.013	-.053***	-.105	.013	-.056***	-.106	.013	-.057***	-.099	.013	-.053***
First-Generation	-.048	.012	-.028***	-.045	.012	-.026***	-.045	.012	-.026***	-.047	.012	-.027***
Freshman	-.405	.018	-.217***	-.419	.019	-.224***	-.42	.018	-.225***	-.418	.019	-.224***
Sophomore	-.040	.017	-.019**	-.059	.017	-.028**	-.06	.017	-.028**	-.044	.017	-.021***
Junior	-.023	.017	-.011	-.035	.017	-.017*	-.036	.017	-.017*	-.024	.017	-.012
Pre-Fall Cumulative GPA	.919	.009	.714***	.916	.009	.711***	.919	.009	.714***	.918	.009	.713***
Univ Housing	-.046	.015	-.026**	-.064	.015	-.036***	-.061	.015	-.034***	-.048	.015	-.027**
TRIO	.094	.056	.011	.068	.058	.005	.031	.057	.004	.068	.057	.008
Checked Out at Least One Material				.103	.014	.051***						
Logged In to a Computer at Least Once				.036	.012	.02**						
Participated in at Least One Instruction Session				.067	.013	.036***						
Received at Least One Research Consult				.018	.069	.002						
Number of Distinct Services							.065	.007	.066***			
Number of Instruction Sessions Participated In										.025	.005	.033***
Constant	.018	.069		.264	.033		.245	.033		.299	.032	

\*P < .05; \*\*P < .01; \*\*\*P < .001

**TABLE 3**  
**Hierarchical Linear Regression Analysis for Three Library Service and Resource Use Models Explaining Spring 2018 Cumulative GPA (N = 9,006)**

	Step 1	Step 2: Individual Services and Resources	Step 2: Number of Distinct Services	Step 2: Number of Instruction Received
R <sup>2</sup>	.590	.595	.594	.591
F	1617.475	1098.776	1462.317	1443.616
R <sup>2</sup> Change	.590	.005	.004	.001
F Change	1617.475***	25.763***	91.250***	22.223***

\**P* < .05; \*\**P* < .01; \*\*\**P* < .001

higher education, the statistical impacts of library use are likely subsumed by variables that entered the model as control variables. For example, some of the TRIO programs have a librarian assigned to work with the students in that program, so it is difficult to separate the impact of being in a TRIO program and the role the library plays. Previous academic achievement, as pre-fall 2017 cumulative GPA, explains the largest proportion of variance in spring 2018 cumulative GPA. However, checking out at least one item has similar effect in magnitude ( $\beta = .051$ ), but in the opposite direction, as being a first-generation student ( $\beta = -.026$ ) or identifying as an underrepresented minority ( $\beta = -.056$ ). There is also evidence suggesting that some variables might violate the collinearity assumption of linear regression, which doesn't affect the parameter estimates but does affect the confidence intervals for these estimates and tests of their statistical significance.

**TABLE 4**  
**Class Levels and Majors of Interview Subjects**

Interview #	Class Level	Major / Area of Study
1	Junior	Audiology & Speech Pathology
2	Sophomore	Musical Theatre
3	Sophomore	Musical Theatre
4	Junior	History & Social Studies Education
5	Sophomore	Nursing
6	Junior	Business and Finance
7	Junior	Criminal Justice and Psychology
8	Senior	Accounting
9	Junior	Psychology and Mexican American Studies
10	Junior	Business and Marketing
11	Freshman	Biology
12	Freshman	European Languages and Culture & Ancient Studies
13	Freshman	English & Secondary Education
14	Sophomore	Nursing
15	Junior	Chemistry
16	Junior	Business and Marketing
17	Freshman	European Languages and Culture & Ancient Studies

### *Student Perceptions of Success and the Libraries*

With the modification of our original study to include qualitative data as well as quantitative, we determined that our working definitions of academic success also needed to evolve. Instead of relying on the common administrative definition of academic success (persistence and GPA), we used our interviews as an opportunity to ask students how they view academic success for themselves. The interviewees represented a variety of class levels and disciplines.

The majority of students we interviewed shared that, to them, success meant *that they made their best possible effort*. Dakota<sup>28</sup> articulated success this way:

making the most out of the academic experience, if you got something out of it. GPA sets you up well, but it's not necessarily linked to success. Because I went here, this is why I think differently....People who have achieved academically start with knowledge and love for reading—this place (the library) is a metaphor for that.

About half of the interviewees shared that, to them, success meant they *gained knowledge, or learned something new—regardless of their assigned grade*. Successfully applying knowledge to real-life or postgraduate situations meant academic success to about half of the students interviewed. A few students mentioned developing a *growth mindset*, getting good grades, or being challenged as indicators of academic success.

From our interviews, we learned that students hold strong and varying opinions about the library. They overwhelmingly value the library as a distinct place on campus. Through qualitative analysis, we identified four major themes regarding the perceived role of the library in students' academic achievement: space; people; place; and resources and services.

#### Space: Tasks Determine Destination in the Library

When asked what words come to mind when they think of the library, our interviewees almost exclusively used words that described the physical space of the library. Words like “books,” “study,” and “windows” were often cited. Therefore, when we discuss the theme of space, we are referring to the interior architecture and furnishings of the library buildings. While these students are aware of, and generally take advantage of, the library's digital resources, for them, the library is a tangible destination. Reese claimed, “I found my place in the library, some people don't want to come here, but for people who want to come here, it is open and easy for me to find my place in the library, my niche, easy to find my spot.” Multiple students mentioned they choose their location based on what they need to accomplish. For example, they venture to the quiet floor for individual work or reading, they use the study rooms for group work, and Sam commented on the beauty of the “big, long tables” available in Michener Library because they felt they could easily spread out with their laptop, notebook, and textbooks.

Many of our interviewees identified the variety of study room options available as a major advantage. Reese noted, “I usually come here for the study rooms upstairs to avoid distractions with living situation and roommate. My brain knows I am here to study and get things done.” Michener Library offers study rooms for one or two people and larger study rooms for

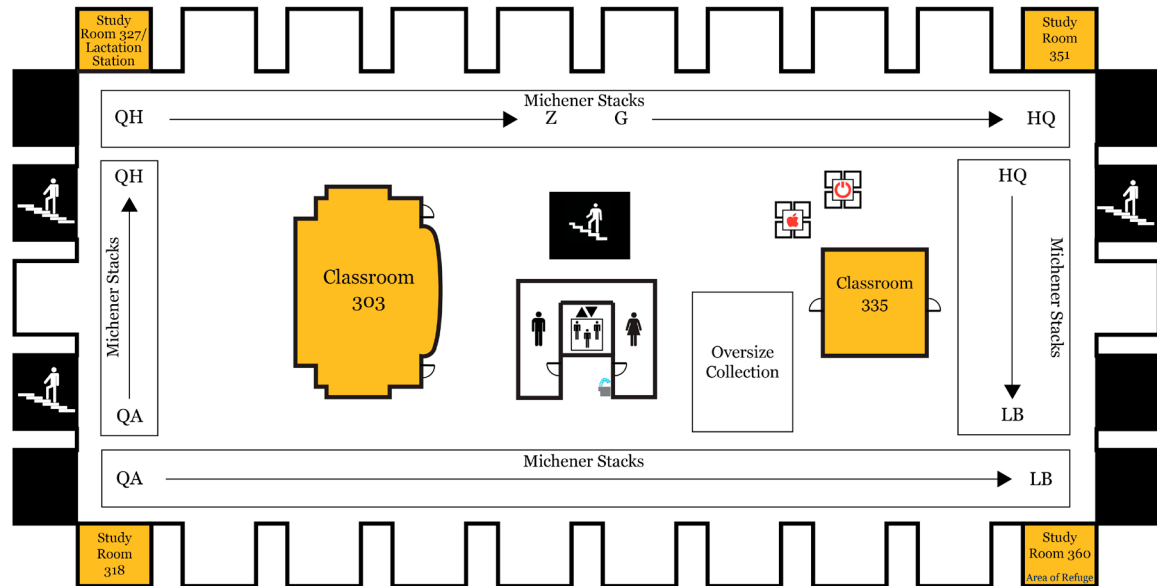
**FIGURE 1**  
**James A. Michener Library Exterior**



**FIGURE 2**  
**James A. Michener Library 3rd Floor Map**

# Michener Library 3rd Floor

## Quiet Study Floor



groups. Students noted they were thankful for the ability to reserve these spaces, but a few wished that there were a few more study rooms that were available on a first-come, first-served basis. A couple of students voiced their desire for more study rooms in general. Study rooms, as distinct spaces within the larger library environment, were clearly viewed as an asset for our students.

The furniture of the library was also a common topic in our interviews. Whether they loved or hated a specific style of furniture, students overwhelmingly appreciated the variety of seating and table options provided by the library. When asked specifically about how they choose where they situate themselves, Sasha said “it really depends on what I’m doing. If it’s something I can do strictly on my laptop, I’ll be in one of the comfier chairs. If it’s something that I’m doing like transferring notes, I’ll be at a harder chair with a desk.”

Finally, many of our interviewees commented on the architectural features of the predominantly concrete, Brutalist building. While a few mentioned that it felt “dated,” most loved the openness and light imparted by the design. The rectilinear layout of the building creates a series of alternating nooks framed by large windows.<sup>29</sup> Multiple students named these bright, semiprivate spaces as their go-to destinations within the library.

### People: Sometimes a Distraction, but Can Offer Help and Comfort

For the theme of people, students referred to both library faculty and staff, as well as other library users. A significant number of our interviewees used the word “helpful” to describe the library. While this could refer to multiple services and resources, “helpful people” was a common refrain. Our interviewees were largely aware of the presence of subject-specific librarians and support staff in the library. A couple of students talked about taking a library course, having a librarian come into one of their classes, or meeting with their liaison librarian for an assignment. Alex classified one of the library’s roles as “people assigned to each department—one person dedicated to my discipline, or someone who can help me find things or use the scanner.” That sentiment was echoed by Chris, who said library staff are “here to help and understand you are there...I never had a bad experience with staff.” Jordan shared the opinion that, “I feel I should utilize the librarians more, like when I am having trouble with a research paper. I don’t, but I should utilize them.” Others discussed interacting with library staff at the information desk or student employees at various service points. While a few of the students mentioned they preferred to be “self-sufficient,” they knew the library was full of people willing to help.

Beyond faculty and staff employed in the library, many of our interviewees discussed people in the library in a broader context. A number of the students we spoke with described the library as a “social environment.” Nearly every student we spoke with discussed noise in the library at some point during the interview. This is perhaps not surprising, given the common stereotype of libraries being quiet places. Students were overwhelmingly positive about the separation of noise zones, by floors, in Michener Library. While multiple students felt that noise enforcement could be more robust on the quiet floor, they generally liked that there is an entire floor dedicated to quiet study. Cameron described enjoying “the sense of camaraderie—even if you don’t know the other students.” Wanting to see the library build on their existing role as a place of community, Morgan said, “other than use it for studying, resources, it could be a great place to bring together academic community events...like club meetings.” Whether the students saw it as positive or negative, the presence of people is an indisputable characteristic of the academic library.

## Place: The Library Is a Place People Know and Want to Be

Overwhelmingly, our students discussed the library as a place—a place to focus, to study, to meet friends, to get away, to get things done. Place as a theme refers to the idea of the library as a destination, as a commonly known entity that supports a larger community. A place is a space that has value-added meaning and is a location enhanced by human experiences. Many of our interviewees noted the library had a good location on campus—everybody knows where it is. This centrality lends itself to students being able to convene group study sessions, concentrate on a homework assignment, meet with their club members, grab a cup of coffee, or simply take a break between classes. Perhaps being able to support such a variety of activities is one of the reasons why many of our students described the library as welcoming or a “safe space.”

As mentioned earlier, many of the students we interviewed tended to find comfort in knowing there were other people at the library, many with the same goals. They described the library as a type of community. Richard Wilkie and George F. Roberson describe attachment to place as “subjective human attraction to, and bonding with, places that are considered to hold special meanings and even sacred qualities for that person.”<sup>30</sup> Dakota stated, “I feel like the library is like the heart of academia.” They went on to say, “We are all here to better ourselves for our future, I like that about the library environment. At a coffee shop you have no idea who they are. At the library you are most likely doing something academic.”

Students also discussed specific services or offerings supported by the library that contribute to the academic community. Athletic study halls, tutoring services, the art gallery, the coffee corner, and late-night study hours were all cited by students as reasons to be in the library. While students expressed varying degrees of approval for these initiatives, the overall impression was that it was important for the library to continue its support of these services.

## Resources and Services: The Library Has What You Need to Get Things Done

For this theme, we are referring to the physical and electronic offerings of the library. Our interviewees named many resources, from movable whiteboards, computers, and outlets to books, archival materials, and specific databases as integral to their library use routines. The accessibility of these resources was also noted by many of the students. While a few students noted the need for an increase in food options, whiteboards, or additions to our collection (databases specific to business students), most of our interviewees were satisfied with the number and variety of our resources. There were disciplinary differences apparent in responses, for example, as science-related major Reese shared: “I feel out of place here [with the print resources]. I go to the website a lot and that is usually how I find my info on English papers.” Riley, a world languages major, however, felt that “everyone knows where it is, you have everything you need, so if you have a group project you go, hey, let’s just meet at Michener Library and use the computers.” A few of the interviewees discussed not understanding or being confused by the organization of the library and suggested that additional signage would help with wayfinding and location of materials.

Technology was frequently cited by the students as a beneficial library offering. Most notably, students appreciated the technology they personally did not possess, such as dual-monitor computers, expensive software packages, or recording equipment. Services such as printing and wi-fi were also mentioned. The concept that the library helped students save money was discussed specifically by a few of our interviewees. They cited the availability of

video-editing software on our public computers and our extensive collection of sheet music as particularly beneficial.

## Discussion

### *Implications of Findings*

The strength of this study is that it explores the role the library plays in student success at two levels. At the institutional level, we conclude University Libraries at UNC does have a positive correlation with improved student success. The quantitative data shows a clear connection between library use and an increase in the probability of persisting to the next year, suggesting the community building impact of the libraries. The link to an improved GPA is minimal, but considering that many of the students interviewed are more concerned with building knowledge and developing a growth mindset, we are not disappointed or discouraged by the GPA results. The qualitative data, which allows us to examine the role the library plays at an individual level, demonstrates the library's role as an academic community center and the critical importance of the library as an academic place.

Others have written opinion pieces and conducted research studies on the library as place and have testified to the importance of the physical space of the library to students.<sup>31</sup> Many of our student interviewees indicated they appreciated the library building and how important it is to them in terms of space and place. Sasha discussed their fondness for their library by stating, "I really like coming here because it's an area specifically for focus, so I don't have the same distractions as I do at home and just the overall feel makes me stay more productive." Much of what our interviewees shared mirrors the notion articulated by Karen A. Neurohr and Lucy E. Bailey in their study of first-generation students and library spaces. They observed, "both libraries and the mini-spaces they encompass can become places of attachment through their instrumental functions and more effable qualities tied to knowledge, history, community and pride."<sup>32</sup> When asked to share words that describe the library, Dakota exclaimed, "it's a little dated, but I kinda love it. Like, the history behind it all—my parents would have been in a library like this." Our findings parallel some of the literature related to academic library architecture. Geoffrey Freeman shared the idea of the library as "extension of the classroom," where students "access and explore with fellow students information in a variety of formats, analyze the information in group discussion, and produce a publication or a presentation for the next day's seminar."<sup>33</sup> The qualitative themes we discovered from our students indicate that the roles of the library as community builder and one that expedites their work are important, dovetailing with Freeman's vision of the library as "centerpiece for establishing the intellectual community and scholarly enterprise."<sup>34</sup>

Within the four themes we identified, students shared in their words how the library contributes to their academic success. For many of them, it provides an important physical environment to enable them to achieve their fullest potential in academic ability. These interviewee reflections show that students feel a sense of belonging with other student scholars when they are using the library. Several interviewees mentioned that coming to the library helps them focus and accomplish their work, away from distractions in their living space and offers a many-faceted place of interaction. The library offers resources and technological access that many students could not otherwise afford. These comments demonstrate how the library's



space, people, place, and resources and services contribute to their academic ability, wellness, sense of belonging, and financial capability—all areas that are critical “pillars” described in our university’s SESS plan for students to persist in their academic careers.

While it is important to the library to be able to demonstrate a link between library use and student success, the results also confirmed there are areas for improvement, as described in the looking to the future section. The initial findings for research consultations, while not statistically significant, did indicate a positive probability for persisting. To better understand the relationship between research consultations and persistence, library’s personnel should be encouraged to promote research consultations so we can further explore if and how this service related to persistence and GPA. In fact, outreach to all members of the UNC community should mention the positive relationship between library use and persistence, and library’s personnel should be encouraging more library use. The results should also be shared with upper-level administrators to remind them of the impact of the library on academic success. This study should serve as a reminder of the importance of including the library in campuswide discussions, particularly in initiatives like the SESS plan previously discussed. We believe that, by highlighting the student voice in these discussions, our findings are not just decontextualized statistics but more nuanced depictions of students’ experiences with the library and its role in their overall success.<sup>35</sup>

Finally, the results of this study stand as further proof that libraries cater to a large community of learners with diverse needs. While academic achievement and persistence are important, students see the library as a “safe space,” a place to meet up with friends, a place to learn, a place to relax, and a place to create. It is imperative that library personnel respond with programming, services, and resources that are responsive to the needs of the whole student.

### ***Study Limitations***

Our study has a few notable limitations. One is that, in our quantitative data, we did not gather any statistics on digital library use. As we know from our institutional IPEDS/ACRL data, digital resources make up a significant portion of our total resource use, so not having this data means we do not have a complete picture of how library use relates to persistence. Second, we encountered some technical difficulties implementing a card-swipe system to gather the specific students who attended instruction sessions; instead, we used the class roster for all the undergraduate classes that scheduled information literacy instruction sessions; some students on the roster may not have attended the session. There are also students who use the library for study space only or may use services, like asking a question at the circulation desk, where we do not gather patron data. Once again, the lack of data does not invalidate the results from our analyses, but it does mean the picture we have is not as robust and nuanced as it could be. Another limitation is that the quantitative findings only include one year of data. Further study is needed to determine if this is a long-term trend.

The limitations of the qualitative analysis include the probability of self-selection bias as well as the effect of having librarians conduct the interviews. By identifying as librarians, the interviewers may have unintentionally influenced the interviewees to provide positive feedback about the library. Finally, like many library value studies, we are unable to account for all potential variables regarding the persistence of students—services like tutoring, counseling, participation in university activities, and the students’ noncognitive attributes like motivation

that potentially have important positive or synergistic influences on why students persist. The statistical procedure we chose, hierarchical regression, does afford researchers an improved ability to parcel out variance explained and attribute it to a particular set of variables, but it, like all regression procedures, is limited to analyzing the data available and so cannot escape this limitation of the variable set.

### *Conclusion*

We set out to answer several research questions with this multimethod study. Our quantitative analysis revealed that checking out library material or using a library computer or attending an information literacy instruction session are all associated with an increase in persistence. Participating in a research consultation was not statistically significant to student persistence, but it did indicate a positive probability for persisting—this finding is likely due to a small sample size. For each additional library service used, there was a higher probability for student persistence. Multiple information literacy instruction sessions also increased the probability for persistence. Our findings indicate that using at least one of these library services has minimal effect on end-of-year grade point average. We determined that we needed an additional approach to gathering data to better understand our findings, so we developed the qualitative piece of the study to include a different methodology. Our qualitative results indicated that students define success as putting forth their best effort, acquiring new knowledge, and being able to apply their new knowledge to real-life situations after graduating, regardless of their GPA or grade they receive in a class. Our qualitative research revealed four themes from the students in terms of how the libraries help them succeed: space, people, place, and resources and services.

There is a bridge between our quantitative and qualitative research findings. Our study objectively focused on students coming to the physical library to conduct activities such as using a computer, checking out physical material, attending an information literacy instruction session, or accessing a research consultation. Most of those activities influenced their persistence. Subjectively, students shared how important it was to be around peers and having a place to focus with other amenities like online resources, library employees, and a variety of spaces to meet their academic goals. The student interviewees talked about being around and interacting with other students, echoing a phrase from our literature review, a place for “educationally purposeful activities.” To put it another way, our findings indicate that the libraries contribute to student success in terms of helping students progress in their knowledge and persist as university students.

The final research question we explored was what role do libraries play in student success? Our findings point to the conclusion that the library fills a unique role for students and provides a trusted network of people, spaces, and resources that help set the stage for students to succeed in terms of persistence and providing a sense of community. The role of the libraries may be that of facilitators of a scholarly community. Ultimately, the benefit of conducting a multi-method study is that our findings provide a more holistic view of library value. Our quantitative analysis gave us the macro-perspective. Based on our analyses, we can draw conclusions about our students and their needs in the aggregate. Our qualitative findings provided us with the micro-perspective by hearing from students directly, and these results provided us with actionable items to help improve the undergraduate student experience with the library.

### *Looking to the Future*

We anticipate the findings of this study will have significant impacts on decision making in the university libraries in terms of how we can increasingly contribute to our students' articulated sense of belonging when they use the library, which in turn impacts their academic success in the form of persistence. This research will have the potential to inform future steps to improve student academic success in terms of our programming, pedagogical decisions, material and equipment purchases, outreach and marketing priorities, and project planning. After all, improving services for students to help them succeed was the main driver of this study. However, we acknowledge it is important to share our findings with a variety of stakeholders. We will develop a strategy to communicate our findings to a variety of audiences. We will share what we learned with the UNC Libraries liaisons and staff, the UNC Strategic Enrollment and Student Success Implementation Team Leads, the Provost, and, perhaps most important, the student body. The libraries intend to continue our involvement in SESS plan as we determine the concrete next steps on our campus.

While we can speculate about the potential implications of our study, one specific project we plan to move forward is the writing of a privacy statement that is specific to library use. We plan to build on the privacy policies developed by our institution<sup>36</sup> by addressing the unique instances of information use and data gathering in an academic library environment that clearly outline potential privacy risks to our students (also a common critique of library value studies). There is the potential to develop this project into a longitudinal study.

Our study provides an addition to the library literature by providing a new way to explore library impact on student success by combining quantitative methods with the activation of the student voice in our interviews. Our study helped confirm that, while there is room for improvement of our services, our library services are indeed impactful to students. Our profession needs to have continued conversations regarding reframing value of library studies. Barbara Fister wrote about the idea of "the value of our values."<sup>37</sup> We should continue to reassert our values—rather than feel that we need to prove our value—which in turn builds on our strengths to provide for our community of students, as well as clarify our role in higher education.

## Appendix. Student Interview Questions

1. What is your year in school and your major?
2. When you think of the library, what words come to mind?
3. What motivates you to do well in school?
4. Do you use the library? How?
  - a. If yes, which ones? How often? Why do you use those resources or spaces?
  - b. If no, why not?
5. How do you define academic success? What does it mean to you?
6. What role does (or can) the library play in your academic career?
7. What could the libraries do more of or differently to improve your success? (Follow-up: What types of events, trainings, furniture, and so on would you like?)
8. Picture yourself doing homework or a research project. Where are you, what are you doing? (Follow-up: Does the library factor into your process? If so, how?)
9. What do you think of the library environment?
10. What if the library...? (fill in the blank)
11. Any other comments?

---

### Notes

1. George D. Kuh et al., *What Matters to Student Success: A Review of the Literature* (Commissioned Report for the National Symposium on Postsecondary Student Success: Spearheading a Dialog on Student Success, July 2006), 7, available online at [https://nces.ed.gov/npec/pdf/kuh\\_team\\_report.pdf](https://nces.ed.gov/npec/pdf/kuh_team_report.pdf) [accessed 10 October 2019].

2. Travis T. York, Charles Gibson, and Susan Rankin, "Defining and Measuring Academic Success," *Practical Assessment, Research & Evaluation* 20, no. 5 (Mar. 2015): 1.

3. This definition was developed by reviewing the relevant literature and considering the character of our institution and student body. Ultimately we used the following documents: Kuh et al., *What Matters to Student Success*, 7; York, Gibson, and Rankin, "Defining and Measuring Academic Success," 5; and Huron Consulting Group, *Strategic Enrollment and Student Success Plan (SESS): Path to Implementation* (Greeley, CO: University of Northern Colorado, 2018), 17, available online at <https://www.unco.edu/president/pdf/task-force/student-enrollment-plan/strategic-enrollment-plan.pdf> [accessed 17 December 2018].

4. University of Northern Colorado, *2019 Spring Final Enrollment Profile* (Greeley, CO, 2019), available online at <https://www.unco.edu/institutional-reporting-analysis-services/pdf/enrollment-stats/Spring2019FinalEnrollmentReport.pdf> [accessed 29 August 2019].

5. Huron Consulting Group, *Strategic Enrollment and Student Success Plan*, 18.

6. Huron Consulting Group, *Strategic Enrollment and Student Success Plan*, 17.

7. Huron Consulting Group, *Strategic Enrollment and Student Success Plan*, 23.

8. Vincent Tinto, "Tinto's South African Lectures," *Journal of Student Affairs in Africa* 2, no. 2 (2014): 5–28, <https://www.journals.ac.za/index.php/jsaa/article/view/1251/473>.

9. George D. Kuh et al., "Unmasking the Effects of Student Engagement on First-Year College Grades and Persistence," *Journal of Higher Education* 79, no. 5 (Sept./Oct. 2008): 555.

10. Kuh et al., "Unmasking the Effects of Student Engagement on First-Year College Grades and Persistence," 555.

11. Kimberly Martin, Richard Galentino, and Lori Townsend, "Community College Student Success: The Role of Motivation and Self-Empowerment," *Community College Review* 42 no. 3 (2014): 221–41.

12. Martin, Galentino, and Townsend, "Community College Student Success," 238.

13. Association of College & Research Libraries (ACRL), *The Value of Academic Libraries: A Comprehensive Research Review and Report*, researched by Megan Oakleaf (Chicago, IL: ACRL, Sept. 2010), available online at [www.ala.org/acrl/sites/ala.org.acrl/files/content/issues/value/val\\_report.pdf](http://www.ala.org/acrl/sites/ala.org.acrl/files/content/issues/value/val_report.pdf)

14. Association of College & Research Libraries (ACRL), *Academic Library Impact: Improving Practice and Essential Areas to Research*, prepared by Lynn Silipigni Connaway, William Harvey, Vanessa Kitzie, and Stephanie Mikitish of OCLC Research (Chicago, IL: ACRL, 2017), available online at [www.ala.org/acrl/sites/ala.org.acrl/files/content/publications/whitepapers/academiclib.pdf](http://www.ala.org/acrl/sites/ala.org.acrl/files/content/publications/whitepapers/academiclib.pdf) [accessed 17 December 2018].

15. A few notable library value studies include the following: Melissa Bowles-Terry, "Library Instruction and Academic Success: A Mixed Methods Assessment of a Library Instruction Program," *Evidence Based Library and Information Practice* 7, no. 1 (2012): 82–95; Gaby Haddow, "Academic Library Use and Student Retention: A Quantitative Analysis," *Library & Information Science Research* 35 (2013): 127–36; Krista M. Soria, Jan Fransen, and Shane Nackerud, "Stacks, Serials, Search Engines, and Students' Success: First-Year Undergraduate Students' Library Use, Academic Achievement, and Retention," *Journal of Academic Librarianship* 40 (2014): 84–91; Adam Murray, Ashley Ireland, and Jana Hackathorn, "The Value of Academic Libraries: Library Services as a Predictor of Student Retention," *College & Research Libraries* 77, no. 5 (Sept. 2016): 631–42; Krista M. Soria, Jan Fransen, and Shane Nackerud, "Beyond Books: The Extended Academic Benefits of Library Use for First-Year College Students," *College & Research Libraries* 78, no. 1 (Jan. 2017): 8–21; and Tiffany LeMaistre, Quingmin Shi, and Sandip Thanki, "Connecting Library Use to Student Success," *portal: Libraries and the Academy* 18, no. 1 (Jan. 2018): 117–40.

16. For an introduction to the work of the researchers at the University of Minnesota–Twin Cities have conducted, see Krista M. Soria, Jan Fransen, and Shane Nackerud, "Library Use and Undergraduate Student Outcomes: New Evidence for Students' Retention and Academic Success," *portal: Libraries and the Academy* 13, no. 2 (2013): 147–64.

17. Angie Thorpe et al., "The Impact of the Academic Library on Student Success: Connecting the Dots," *portal: Libraries and the Academy* 16, no. 2 (2016): 373–92.

18. Thorpe et al., "The Impact of the Academic Library on Student Success," 387.

19. M. Brooke Robertshaw and Andrew Asher, "Unethical Numbers? A Meta-Analysis of Library Learning Analytics Studies" (pre-print manuscript, Feb. 25, 2019), available online at <https://ir.library.oregonstate.edu/concern/articles/bc386q51c> [accessed 28 June 2019].

20. Zoe Fisher, "Who Succeeds in Higher Education? Questioning the Connection Between Academic Libraries and Student Success" (plenary presentation, California Academic & Research Libraries conference, Redwood City, CA, Apr. 15, 2018), available online at <https://quickaskzoe.com/2018/04/15/who-succeeds-in-higher-education/> [accessed 28 June 2019].

21. An example of a study using logistic regression is Adam Murray, Ashley Ireland, and Jana Hackathorn, "The Value of Academic Libraries: Library Services as a Predictor of Student Retention," *College & Research Libraries* 77, no. 5 (Sept. 2016): 631–42. An example of a study using hierarchical regression is Ethelene Whitmire, "Development of Critical Thinking Skills: An Analysis of Academic Library Experiences and Other Measures," *College & Research Libraries* 59, no. 3 (May 1998): 266–73.

22. Following are some *College & Research Libraries* articles that feature hierarchical regression but not binary dependent variables: Samantha Godbey, "Testing Future Teachers: A Quantitative Exploration of Factors Impacting the Information Literacy of Teacher Education Students" (July 2018), available online at <https://crl.acrl.org/index.php/crl/article/view/16764/18302> [accessed 10 October 2019]; Jennifer Fabbi, "Fortifying the Pipeline: Quantitative Exploration of High School Factors Impacting the Information Literacy of First-Year College Students" (Jan. 2015), available online at <https://crl.acrl.org/index.php/crl/article/view/16400/17846> [accessed 10 October 2019]; Joyce S. Phillips, Kerry D. Carson, and Paula P. Carson, "Evolution of Affective Career Outcomes: A Field Study of Academic Librarians (Nov. 1994), available online at <https://crl.acrl.org/index.php/crl/article/view/14930/16376> [accessed 10 October 2019]; and Ethelene Whitmire, "Development of Critical Thinking Skills: An Analysis of Academic Library Experiences and Other Measures" (May 1998), available online at <https://crl.acrl.org/index.php/crl/article/view/15209/16655> [accessed 10 October 2019].

23. Sharan B. Merriam and Elizabeth J. Tisdell, "Conducting Effective Interviews," in *Qualitative Research: A Guide to Design and Implementation* (San Francisco, CA: Jossey-Bass, 2015), 108.

24. Janice M. Morse, "The Implications of Interview Type and Structure in Mixed-Methods Design," in *The Sage Handbook of Interview Research: The Complexity of the Craft*, eds. Jaber F. Gubrium, James A. Holstein, Amir B. Marvasti, and Karyn D. McKinney (Los Angeles, CA: SAGE Publications, 2012), 197.

25. Sharan B. Merriam and Elizabeth J. Tisdell, "Qualitative Data Analysis," in *Qualitative Research: A Guide to Design and Implementation* (San Francisco, CA: Jossey Bass, 2015), 195–236.

26. Johnny Saldaña, "First Cycle Coding Methods," in *The Coding Manual for Qualitative Researchers* (Los Angeles, CA: SAGE Publishing, 2009), 45–148.

27. Maximiliano Montenegro et al., "Library Resources and Students' Learning Outcomes: Do All the Resources Have the Same Impact on Learning?" *Journal of Academic Librarianship* 45, no. 5 (Sept. 2016): 551–56.

28. All student names provided in this article are pseudonyms.

29. See figures 1 and 2 for images of the James A. Michener Library level 3 floor plan, and the library exterior, for context.

30. Richard Wilkie and George F. Roberson, "Attachment to Place," in *21st Century Geography: A Reference*

*Handbook*, ed. Joseph P. Stoltman (Los Angeles, CA: SAGE Publishing, 2012), 135–48.

31. A few of the studies include: Michael J. Khoo et al., “‘A Really Nice Spot’: Evaluating Place, Space, and Technology in Academic Libraries,” *College & Research Libraries* 77, no. 1 (Jan. 2016): 51–70; Seung Hyan Cha and Tae Wan Kim, “What Matters for Students’ Use of Physical Space?” *Journal of Academic Librarianship* 41 (2015): 274–79; and Karen A. Neurohr and Lucy E. Bailey, “First-Generation Undergraduate Students and Library Spaces: A Case Study,” in *Assessing Library Space for Learning*, ed. Susan E. Montgomery (Lanham, MD: Rowman & Littlefield, 2017).

32. Neurohr and Bailey, “First-Generation Undergraduate Students and Library Spaces,” 169.

33. Geoffrey T. Freeman, *The Library as Place: Changes in Learning Patterns, Collections, Technology, and Use*, Report 5 (Arlington, VA: Council on Library and Information Resources, Feb. 2005), available online at <https://www.clir.org/pubs/reports/pub129/freeman/> [accessed 28 June 2019].

34. Freeman, *The Library as Place*, 3.

35. Jennifer Mayer and Rachel Dineen, “Debating Student Privacy in Library Research Projects,” in *ACRL 2019 Proceedings* (Chicago, IL: ACRL, 2019): 183–89, available online at [www.ala.org/acrl/sites/ala.org.acrl/files/content/conferences/confsandpreconfs/2019/DebatingStudentPrivacyinLibraryResearchProjects.pdf](http://www.ala.org/acrl/sites/ala.org.acrl/files/content/conferences/confsandpreconfs/2019/DebatingStudentPrivacyinLibraryResearchProjects.pdf) [accessed 28 June 2019].

36. University Regulations (University of Northern Colorado, Greeley, CO, Sept. 5, 2018, 3-9-206), 27, 97–98, available online at [https://www.unco.edu/trustees/pdf/University\\_Regulations.pdf](https://www.unco.edu/trustees/pdf/University_Regulations.pdf) [accessed 28 June 2019].

37. Barbara Fister, “Introduction: The Value of Our Values” (Essays Commissioned for ACRL’s 75th Anniversary, Chicago, IL: Association of College & Research Libraries, 2019), available online at [https://acrl.ala.org/newroles/?page\\_id=269](https://acrl.ala.org/newroles/?page_id=269) [accessed 8 November 2019].