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Résumé de l'article

Objective – This paper reports on a study which assessed the preferences and behaviors of overnight library users at a major state university. The findings were used to guide the design and improvement of overnight library resources and services, and the selection of a future overnight library site.

Methods – A multi-method design used descriptive and correlational statistics to analyze data produced by a multi-sample survey of overnight library users. These statistical methods included rankings, percentages, and multiple regression.

Results – Results showed a strong consistency across statistical methods and samples. Overnight library users consistently prioritized facilities like power outlets for electronic devices, and group and quiet study spaces, and placed far less emphasis on assistance from library staff.

Conclusions – By employing more advanced statistical and sampling procedures than had been found in previous research, this paper strengthens the validity of findings on overnight user preferences and behaviors. The multi-method research design can also serve to guide future work in this area.

Evidence Based Library and Information Practice

Research Article

Studying the Night Shift: A Multi-method Analysis of Overnight Academic Library Users

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Abstract

Objective – This paper reports on a study which assessed the preferences and behaviors of overnight library users at a major state university. The findings were used to guide the design and improvement of overnight library resources and services, and the selection of a future overnight library site.

Methods – A multi-method design used descriptive and correlational statistics to analyze data produced by a multi-sample survey of overnight library users. These statistical methods included rankings, percentages, and multiple regression.

Results – Results showed a strong consistency across statistical methods and samples. Overnight library users consistently prioritized facilities like power outlets for electronic devices, and group

and quiet study spaces, and placed far less emphasis on assistance from library staff.

Conclusions – By employing more advanced statistical and sampling procedures than had been found in previous research, this paper strengthens the validity of findings on overnight user preferences and behaviors. The multi-method research design can also serve to guide future work in this area.

Introduction

As academic libraries have increasingly prioritized services, they have sought new constituencies and new ways to assist them. One popular initiative has involved extending library hours, most commonly to cover a 24-hour schedule during weekdays. But while such programs represent a major effort, and a major commitment of institutional resources, the scholarly literature on this topic remains small, consisting primarily of descriptive case studies.

This paper extends this body of work in two ways. First, focusing on the key topic of user activities during overnight hours, we conduct a multi-method case study. Our survey-based study goes beyond previous studies—which have been wholly descriptive—by using both descriptive and correlational analyses to explore overnight user attitudes and behavior. The results of these analyses "triangulate" to show a consistent pattern; overnight users prioritize study spaces and resources to support study, like power outlets. More traditional library resources and services, i.e. library materials and assistance from library staff, are seen as less important.

Second, our approach also provides robust grounds for generalizing our findings. Survey respondents were recruited at two different campus libraries, as well as through the media, with each of these three groups of respondents comprising a separate survey sample. Results for all three survey samples mirrored the overall results described above. This consistency across multiple samples provides an enhanced basis for generalization; that is, for assuming that the results from our survey accurately represent the overall user population at our university. In sum, then, our approach—a multi-method study conducted across multiple survey samples—extends previous studies, and yields particularly well-founded conclusions about the preferences and behaviors of overnight users. These conclusions then can support effective library decision making and policies.

Literature Review

Over the last several decades, the proportion of American academic libraries offering extended hours has increased significantly (Sanders & Hodges, 2014). While a few extended hours programs existed as early as the 1980s (Bowman, 2013; Smith, 2008), overnight hours were uncommon. A 2002 study found that 5 out of 97 Association of Research Libraries (ARL) member libraries featured some kind of regular 24 hour access during the week; 2 others offered extended hours access to stacks and circulation services (Arant & Benefiel, 2002). An Association of College & Research Libraries weblog used data from the 2004 Academic Libraries Survey to calculate that only 24 of roughly 3,700 U.S. academic libraries reported keeping a 24/7 schedule at that time (ACRL, 2006). By 2011, a survey of ARL library deans and directors found that 71% reported holding either 24/5 or 24/7 hours in some part of their library space (Laaker, 2011). Thus extended hours have become common at larger academic libraries, although the current prevalence at non-ARL academic libraries remains unclear.

An important research focus has involved overnight library users. The studies most

relevant for this paper have examined services, resources and activities; what kinds of library services and resources do night patrons want during overnight hours, and what are they doing at the library during this time? Lawrence & Weber (2012) found that users are engaged in quiet study, using computers and printing, group work, and associating with friends. Less common activities involved accessing course reserves or seeking assistance from library staff. Engel, Womack and Ellis found that studying and using a computer were the two most common activities, with assistance from a librarian ranking last among nine options (2002). Survey data ranked quiet study, work on projects or papers, group study, and printing as most important (Scarletto, Burhanna & Richardson, 2013). Demand for circulation and staff services was consistently low. Laaker summed this up by noting that "the majority of late-night users come to [overnight hours] for the space itself—not for the physical collections and access to Help Desk services (2011, p. 22)."

These user studies have been informative. But the literature remains small—only a handful of studies have been conducted—and it is entirely descriptive (Ravenwood, Stephens, & Walton, 2015, p. 53; Scarletto et al., 2013, p. 372). Accordingly, it is useful to extend it, as we do here.

Background

The George A. Smathers Libraries at the University of Florida consist of six units. The two largest facilities are the humanities and social sciences library, Library West, and the Marston Science Library, which serves STEM and agriculture-related fields.

In 2013, at the urging of the university's student government, the Libraries inaugurated a "24/5 hours" program where one library remained open, around the clock, during weekdays. The program was located at the humanities and social sciences library for two years, and then switched to the science library in the third year. At this point, library administration sought to devise a longer-term arrangement. In order to collect data on overnight users, and choose a site for future overnight library hours, the administration commissioned a survey.

Data and Methods

Survey Instrument

The main body of the survey consisted of three distinct but overlapping sets of items. The first set asked survey respondents to rank 10 overnight library resources and services in order of their perceived importance. Second, respondents were asked to indicate which of seven overnight resources and services they actually used. A third set of items asked respondents to evaluate the two candidate libraries on a set of resources and services, and to indicate which library—West or Marston—would do a better job of providing each of these. Respondents also indicated their preference for the location of the overnight hours program, and basic demographic variables were also collected (the complete survey instrument is provided in the Appendix).

The survey instrument underwent pre-testing before going into the field. Several volunteers serving in the current student government took the survey, providing think-aloud reactions and subsequent verbal feedback. This allowed the designers to modify any ambiguous or problematic items.

The survey was administered over a one-week period during the spring 2016 semester. Responses were solicited in several ways. Within each of the two candidate libraries, print surveys were distributed, and promotional signage directed library users to an online Qualtrics survey website (each library used a unique website address, which allowed us to determine the origin of all online responses). Online survey participation was also solicited through the libraries' Twitter and Facebook accounts, and via a short news story in the

campus newspaper (again using a unique Qualtrics website). This provided three survey samples; respondents solicited within Library West, respondents solicited within the Marston Science Library, and respondents solicited outside of the libraries, through traditional and social media channels.

These samples were selected for several reasons. First, we wanted to obtain the opinions and preferences of current overnight users. Print surveys were distributed and collected during overnight library hours at the Marston Science Library. Because overnight hours were being held only at Marston during this time, print surveys were distributed and collected at Library West during evening hours—9-11 p.m.—since this provided the closest approximation to overnight hours. Second, we also wished to obtain responses from users who might not currently be visiting the libraries during overnight hours. To tap such current daytime users, print surveys were also distributed and collected during daytime hours at both libraries. (And, of course, the in-library signage could be seen at any time, and thus could have solicited responses from both user and non-user groups.) Finally, our solicitations in social media and the newspaper were used to reach those overnight library users—intermittent users, or those away from campus—who might not be using the libraries at all during the one-week survey administration period.

Since the survey involved choosing a location for overnight library services, it was possible that some respondents might have had strong preferences on this matter, and thus an incentive to try to sway the outcome. If so, and they submitted multiple responses, this could have undermined the validity of our results. Accordingly, we guarded against this possibility. With print surveys, we were careful to distribute only one copy to each library user in our sample. For online surveys, we prevented respondents from easily refreshing screens to submit another survey; instead, they would have had to log out or open multiple browsers. Finally, following completion of the survey, we checked the respondent URLs included in the Qualtrics survey data, looking for repeated patterns. We found nothing that raised our suspicions or concerns.

A total of 2,852 respondents submitted surveys. A screening question revealed that approximately 83.5% of these respondents reported previous use of the library during overnight hours. Since we were interested in obtaining feedback for overnight operations, the data analyses presented here were limited to this subset of respondents. This yielded a final sample size of 2,377.

While it would be desirable to report the survey response rate, we are unable to provide a direct figure on this. Since our libraries do not specifically collect overnight gate count data, we have no way of determining the size of the overnight user population. However, several other studies do permit a rough estimate. Studies from other state university libraries that collect such data have found that overnight users comprised between 17.5% and 22% of the overall student body (Sanders & Hodges, 2014; Scarletto, Burhanna & Richardson, 2013). If our overnight "usage rate" was similar to these, our estimated overnight user population would range between approximately 9,500 and 12,000. With our sample size of 2,377, this would suggest a response rate of between 20 and 25%.

Methods

By providing data on three distinct measures of overnight user preferences and activities, our survey supported a multi-method analysis of these phenomena. In contrast to the more familiar multimethod approaches, which involve collection and analysis of multiple forms of data, we use multiple methodologies to analyze the same body of data (Mingers, 2001; Mingers & Brocklesby, 1997). Despite this difference, however, these two approaches share the same goal: both seek to provide greater

analytical traction by approaching a research question from several different directions, and finding consistency across different sets of results.

Descriptive statistics were used to analyze overnight users' rankings of items on the first two scales: first, the perceived importance of 10 overnight library resources and services, and second, how often these were actually used during overnight hours. For importance, average ranking scores were calculated for each of the resources and services. For actual usage, we calculated the percentages of respondents who reported using each resource or service.

The correlational analysis relied on two pieces of data. As previously noted, users were asked to evaluate the two candidate libraries—Library West and Marston Science Library—on a set of resources and services, including library services, security inside the library, security outside the library, and a good atmosphere for study—and indicate which library would do the best job of providing each of these. For each attribute, respondents recorded their ratings on a three-point Likert scale: Better at Marston, Similar at Both Libraries, or Better at West.

Data on these four library attributes were then used as the independent variables in a multiple regression equation. The dependent variable came from the survey question asking respondents to indicate their preferred 24/5 hours site. While a dependent variable with a three-category Likert scale might have prompted usage of some form of logistic regression, linear regression is robust for ordinal variables (Gertheiss & Oehrlein, 2011; Winship & Mare, 1984), and linear regression has the virtue of providing standardized Beta coefficients and a meaningful R-squared statistic. The beta (or standardized regression coefficients) in the regression results will then show which of these four attributes had the strongest impact on users' site preferences.

Finally, a note on terminology. When analyzing such a wide range of library attributes, it is important to be clear about our wording. We use "resources" to refer to elements of the library like power outlets, study spaces, and library materials, and "services" to refer to staff-provided assistance and the Starbucks café. The former category also includes "study atmosphere," and the latter includes "security." While these two elements do not fit as neatly into this scheme—neither security nor atmosphere represent a clear-cut resource or service—this approach does provide a useful clarity overall. Where appropriate, "attributes" is used as a general term to refer to both resources and services.

Results

For our core research focus—determining what kinds of library resources and services overnight patrons desire and use—analyses of all three sets of survey items produced highly consistent results.

Perceived Importance of Library Resources and Services

Survey respondents were asked to rank 10 library attributes in terms of their perceived importance. Mean rank scores for each of these are reported in Table 1 (since the rankings used a 1-10 scale, ranging from most to least important, lower numerical scores indicate higher rankings):

Usage of Resources and Services

A second set of survey items moved beyond attitudes and preferences regarding library resources and services by asking respondents which of these they had actually used during overnight hours. The results in Table 2 indicate the percentages of overnight users reporting usage of each resource or service.

Across Tables 1 and 2, the library attributes differ to some degree. Security and the "other

Table 1
Mean Importance Rankings of Library Resources and Services

Power Outlets	Quiet Study Space	Group Study Space	Café	Library Tech	Library Materials	Security Inside Library	Security Outside Library	Assist from Library Staff	Other Tech
2.8	2.8	3.5	4.7	4.9	6.3	6.3	6.6	8.1	9.1

N=2312

Table 2
Percentage Reporting Usage of Library Resources and Services

Power Outlets	Quiet Study Space	Café	Group Study Space	Library Tech	Library Materials	Assist from Library Staff
90	81	81	73	44	19	5

N=2366

technology" responses were omitted from the "usage" section of the survey; security is not an attribute that is personally "used" by patrons, and 3D printing was available only in Marston (and thus could not be used in West). But for the seven resources and services that were included in both tables, the orderings were highly consistent; power outlets and quiet study space were viewed as most important, and used most frequently, followed by group study and Starbucks, with technology, library materials, and staff assistance seen as least important, in that order.

While it may not seem surprising that patrons' actual usage of library resources and services would match their views on the importance of these attributes, it is important to note that such consistency is by no means a given. These two sets of items tap two different phenomena—attitudinal preferences and behavior—and they are measured with two different types of scales; one involves ranking alternatives while the other asks users to check boxes indicating their usage of resources and services. And from a more theoretical point of view, a large social psychology literature demonstrates the common lack of linkage between attitudes and behaviors, attesting to the finding that "attitudes and preferences do not always prove to be good predictors of actual behavior" (Elen, D'Heer, Geuens & Vermeir, 2013; see Ajzen & Fishbein, 1977, and Ajzen & Fishbein, 2005 for general treatments of this topic). Accordingly, the consistency seen here is revealing and important.

Resources and Services -- Impacts on Library Preferences

Our survey data also allowed us to take a third look at the priorities and preferences of overnight users. Survey respondents were asked to indicate their preferred 24/5 hours site; they could choose either Marston Science Library or Library West, or indicate that these two libraries would be equally desirable. They were also asked to compare these two libraries on a set of relevant attributes; study atmosphere, library services, and security inside and outside the library.

We used a multiple regression analysis to determine how these four attributes impacted upon users' overnight library choices. In this situation, impact equates with correlation size,

Table 3
Regression Results: Service Ratings and Overnight Library Choice

(Constant)	4.159	.040	--	103.652	.000
Study Atmosphere	.466	.018	.444	26.210	.000
Library Services	.409	.019	.381	22.082	.000
Security Outside	.127	.017	.095	7.319	.000
Security Inside	.082	.018	.055	4.437	.000

N=2320 Adjusted R^2 .722

and thus the attribute showing the strongest correlation had the strongest impact on respondents' library choices, the attribute with the weakest correlation had the weakest effect, and so on.

Based on users' rankings of importance, as seen in Table 1, we would expect that study atmosphere and library services would show the strongest correlation with users' library choices, with security concerns showing the weakest correlation.

As Table 3 shows, this hypothesis was correct. The size of the standardized regression (beta) coefficients indicate that a good study atmosphere (captured by quiet and group study), and library resources (power outlets, Starbucks, and library technology and materials) had a stronger impact on users' overnight library choices than the security did.
The low importance placed on security might seem to reflect our library's location in a university community, or "college town." If this was so, then the importance of security to users could be artificially suppressed. However, this seems unlikely for several reasons. First, the local crime rates are well above the state and national averages. Accordingly, security concerns are unlikely to be suppressed by the bucolic nature of our university surroundings. This point is buttressed the overnight library literature; overnight library users have indicated a relative lack of security concern in other studies (Lawrence & Weber, 2012, p. 538; Scarletto et al., 2013, p. 374). Thus we conclude that the importance of library factors did outrank the importance of security, just as in Table 1.

Demonstrating that library factors outranked security represents a rather general test, and thus it would ideally be desirable to further unpack the "study atmosphere" and "library services" categories in order to determine the impacts of individual factors like study space, materials usage, technology and so on. Unfortunately, however, this is not possible here. Since we were concerned about survey fatigue, we did not repeat the entire list of factors included in Table 1, and thus we have measurements only for the general library categories seen in Table 3.

Still, we can be confident in the general picture here. The Table 3 results do reflect those from Table 1. Moreover, the adjusted R-squared of .722 indicates that the model performed extremely well, explaining almost three-quarters of the variation in user siting preferences, and thus that these four criteria, as a set, strongly shape these preferences.

Results Across Multiple Survey Samples

Overall, then, our multi-method approach produced satisfying results; the findings from these three separate analyses triangulate well, and present a consistent picture. This consistency provides confidence that we have accurately captured the views of our overnight library users.

Table 4
Importance of Library Resources and Services by Sample

	Power Outlets	Quiet Study	Group Study Space	Café	Library Tech	Library Materials	Security Inside Library	Security Outside Library	Assist from Library	Other Tech
Marston	1	2	3	4	5	6	7	8	9	10
Media	1	2	3	4	5	6	7	8	9	10
West	2	1	3	4	5	6	7	8	9	10

N = 811 for Marston Science Library; 774 for Media; 727 for Library

Table 5
Usage of Library Resources and Services by Sample

	Power Outlets	Quiet Study Space	Café	Group Study Space	Library Tech	Library Materials	Assist from Library Staff
Marston	89	73	80	74	40	18	5
Media	93	85	83	78	44	17	4
West	88	85	81	68	48	22	7

N = 840 for Marston Science Library; 783 for Media; 743 for Library West

However, the results presented above are based on a single, combined and aggregated survey sample. Accordingly, one must be cautious in generalizing from this. However, our survey method permitted more specific analysis. Our aggregated sample was created by combining three separate sub-samples—solicited within Marston Science Library, Library West, or via social and newspaper media—and so these can be broken out by sample and analyzed separately.

Repeating our earlier analyses, by sample, we can see that all three groups of users showed a highly similar ordering of priorities. Table 4 summarizes user rankings of the importance of 10 overnight library resources and services across the three samples.

As is evident, the importance rankings, given by users, are strikingly consistent across the three survey samples.

A similar finding is reported for actual usage of resources and services. Here too we see that reported patterns of use (measured by percentage of users reporting usage of each type of library resource of service) were broadly similar across the three sets of survey samples (Table 5).

Thus no matter which campus library they patronize, or how their participation was recruited, overnight users hold similar perceptions and engage in similar types of activities.

Finally, we can compare regression results across our three library samples. Table 6 summarizes Beta coefficients and other key aspects of regression model performance for all three samples.

As is evident, all three samples produced similar results; strong impacts for study atmosphere and library services, with minimal, if any, appreciable substantive effects for security concerns.

Table 6
Regression Results: Library Attributes and Overnight Library Choice

	Beta (Marston Science Library Sample)	Beta (Media Sample)	Beta (Library West Sample)
Study Atmosphere	.347***	.492***	.480***
Library Services	.414***	.341***	.320***
Security Outside	.088***	.101***	.115***
Security Inside	.101***	.053*	.008
Sample N	816	782	722
Adjusted R^2	.617	.764	.588

* = Significant at .05; ** = Significant at .01; *** = Significant at .001

Limitations

Self-Reported Usage Measures

One limitation involves our procedure for measuring actual usage of library resources and services. These statistics are based on user self-reports, and the accuracy of such reports have been a subject of persistent controversy. Self-report studies have most commonly examined health-related topics, including eating habits and body mass (Bowman & DeLucia, 1992), or smoking and drinking alcohol (Del Boca & Darkes, 2003). Others have addressed matters as diverse as voting turnout, marital violence, and donations to charitable organizations (Abelson, Loftus & Greenwald, 1992; Arias & Beach, 1987; Bekkers & Wiepking, 2011). Many of these studies have uncovered systematic divergences between individuals' self-reports and documented measures of the same phenomena. At the same time, however, other studies have concluded that self-reports are often accurate, and that they provide "a reliable and valid approach" for analyzing behavior (Del Boca & Darkes, 2003, p.1).

For our purposes, this previous work does not permit us to make a well-grounded inference about the accuracy of usage reports by our library users. Mixed findings are reported in the literature, and we were unable to identify any studies that had specifically examined self-reports of library usage.

The usual solution would involve obtaining independent measures of these behaviors and comparing them with our user reports. As perusal of Table 2 shows, this would require marshaling several types of data. Usage measures for library materials and user demand for staff assistance and group study space could draw on existing "transactional" data—that is, data generated by library systems for circulation, reference transactions, and study room reservations. Data for usage of quiet study spaces and power outlets would have to be collected; this could be accomplished by observing usage of these at a randomly selected set of times. The same observational approach could be used for Starbucks café patronage (or, alternatively, perhaps the company would provide data on business volume).

While all of these steps would be feasible, they would require substantial time and effort. This is the major reason why such checks have not played a larger role in scholarly research studies—with previous overnight library studies included—and, conversely, why researchers have taken such great interest in the accuracy of self-reports.

Table 7
Sample vs. Population Demographic Percentages

	Sample	Population
Undergraduates	91.0	64.3
Graduates	7.9	31.0
Male	34.0	45.5
Female	64.7	54.4

N = 2,337 (Sample) 54,208 (Population)
Percentages total less than 100 due to omission of smaller categories

Table 8a
Mean Importance Rankings of Library Resources and Services — Undergraduates

Power Outlets	Quiet Study Space	Group Study Space	Café	Library Tech	Security Inside Library	Library Materials	Security Outside Library	Assist from Library Staff	Other Tech
2.7	2.8	3.4	4.7	4.9	6.2	6.4	6.5	8.1	9.2

N = 2099

Table 8b
Mean Importance Rankings of Library Resources and Services — Graduate Students

Quiet Study Space	Power Outlets	Group Study Space	Library Tech	Café	Library Materials	Security Inside Library	Security Outside Library	Assist from Library Staff	Other Tech
2.7	3.8	4.2	4.4	4.9	5.0	6.6	7.2	7.3	8.7

N = 179

Non-Random Sample

The most significant limitation in this study is common to most survey-based library research; the lack of a randomly-selected sample. This makes it difficult or impossible to generalize research findings. In this paper, however, this problem may be somewhat mitigated by our use of multiple samples, and by the highly consistent findings across these samples. This cross-sample consistency may suggest that our university student population is highly homogenous in its overnight library preferences. If so, then our sample results may be reasonably consistent with this larger population.

Still, it would be useful to have a better grasp on this key matter. In order to examine this, we obtained university-level data from our university's Office of Institutional Planning and Research. By comparing our sample with the overall student population on two demographic variables included in our survey—gender and academic status (e.g. undergraduate-or graduate-level standing)—we can estimate the demographic representativeness of our sample (Table 7).

Clearly, our sample deviates from the demographics of the overall university student population; sharply so for the balance between undergraduate and graduate students. If students in different demographic categories have different perceptions and usage patterns, then this may have induced biased results in our survey.

Table 8c
Mean Importance Rankings of Library Resources and Services — Male Respondents

Quiet Study Space	Power Outlets	Group Study Space	Library Tech	Café	Library Materials	Security Inside Library	Assist from Library Staff	Security Outside Library	Other Tech
2.6	3.0	3.3	4.4	5.3	5.6	6.9	7.7	7.7	8.7

N = 777

Table 8d
Mean Importance Rankings of Library Resources and Services — Female Respondents

Power Outlets	Quiet Study Space	Group Study Space	Café	Library Tech	Security Inside Library	Security Outside Library	Library Materials	Assist from Library Staff	Other Tech
2.7	2.9	3.6	4.4	5.1	5.9	6.0	6.7	8.3	9.3

N = 1501

Perceived Importance of Library Resources and Services

In order to examine this, we broke our previous findings down by these demographic categories. Tables 8a-8d show the results for mean importance rankings of library resources and services.

When we compare our results across gender and academic status, it is clear that the rankings across groups are broadly similar. There are some differences, of course; for graduate students, power outlets and group study spaces are a bit less important than for undergraduates, with library materials a bit more important. Presumably this reflects undergraduates' habit of using the library primarily as a study facility, and graduates' increased engagement with scholarly materials. For the second comparison, female students, not surprisingly, show a somewhat heightened concern for security.

Overall, however, all the groups are broadly similar in their importance rankings. Power outlets, quiet and group study spaces are most important, followed by café services and library technology. Library staff assistance and other technology are usually the least important, with the remaining resources and services somewhere in between.

Usage of Resources and Services

Our usage percentage results also show significant cross-group similarity. Power outlets, café services, and quiet and group study spaces generally vie for the most used library attributes. Library technology, library materials, and staff assistance are used least; the last three have an identical ordering across all groups. There are some differences in rate of usage, with graduate students showing less usage than undergraduates, but the relative usage orderings show a broad consistency (Tables 9a-9d).

For our third measure, the regression analysis, the overall pattern again is similar to what we have previously seen. While the specific numbers vary, the pattern of Beta coefficients are similar across all groups; study atmosphere and library services are the most important, with security least important, just as in Tables 3 and 6 (Table 10).

In general, then, group breakdowns on all three of our measures show consistent results. What does this tell us? In one sense, this nicely extends our earlier findings, which also identified broad consistency across measures of resources and services. Accordingly, our claims about consistency are even more robust than we had supposed.

Table 9a
Percentage Reporting Usage of Library Resources and Services — Undergraduates

Power Outlets	Café	Quiet Study Space	Group Study Space	Library Tech	Library Materials	Assist from Library Staff
92	82	81	75	43	18	5

N = 2143

Table 9b
Percentage Reporting Usage of Library Resources and Services — Graduate Students

Quiet Study Space	Power Outlets	Café	Group Study Space	Library Tech	Library Materials	Assist from Library Staff
75	73	71	52	52	28	7

N = 184

Table 9c
Percentage Reporting Usage of Library Resources and Services — Male Respondents

Power Outlets	Quiet Study Space	Group Study Space	Café	Library Tech	Library Materials	Assist from Library Staff
85	78	68	67	45	21	7

N = 802

Table 10
Regression Results: Library Attributes and Overnight Library Choice – All Groups

	Beta Undergraduates	Beta Graduate Students	Beta Males	Beta Females
Study Atmosphere	.445***	.432***	.483***	.425***
Library Services	.388***	.320***	.328***	.405***
Security Outside	.094***	.086	.087***	.099***
Security Inside	.047***	.148**	.070**	.049**
Sample N	2106	182	785	1504
Adjusted R^2	.728	.644	.699	.733

* = Significant at .05; ** = Significant at .01; *** = Significant at .001

As for the question at hand, the sample-population relationship, do these findings provide evidence for a representative sample? In one sense, yes. The consistency across groups suggests that demographic imbalance in our sample may have only minor effects. However, this still does not mean we can confidently generalize from our sample to our overall university student population. It still is possible that the subjects we sampled—regardless of their demographic categories—might be systematically unrepresentative of the broader population.

A more confident conclusion would require a more advanced methods. A commonly recommended solution would apply a weighting scheme via a "raking" or sample-balancing procedure (Anderson & Fricker, 2015; Battaglia, Hoaglin & Frankel, 2009). While such an approach is outside of the scope of this paper, it would represent a logical path for future studies in this area.

Discussion and Conclusion

This paper adds an additional case study to the small existing literature on the attitudes and behaviors of overnight users at academic libraries. And in supplementing previous studies, it has employed a more advanced approach that has extended the literature in two useful ways.

First, our usage of a multi-method research design has allowed us to take a multifaceted look at overnight users. While prior research in this area has relied solely on descriptive approaches, we employ both descriptive and correlational statistics to demonstrate consistent findings across multiple measures of user preferences. Second, by replicating these results across multiple survey samples, we provide additional evidence for the veracity of these findings. Three different samples produced a highly consistent picture of the preferences and behaviors of overnight library users.

Either of these approaches, by itself, would buttress our conclusions. Together, these two approaches—and the consistent findings they produce—increase confidence in our results compared with earlier studies. While grounds for generalizing from our sample results to our overall university population remain elusive, we believe that the increased internal validity in this study does advance practice in this area of the library literature, and we would suggest that future studies might consider adopting this type of approach.

References

Abelson, R.P., Loftus, E. F., & Greenwald, A.G. (1992). Attempts to improve the accuracy of self-reports of voting. In J. M. Tanur (Ed.), *Questions about questions: Inquiries into the cognitive bases of surveys* (pp. 138-153). New York, NY: Sage.

Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin, 84*(5), 888-918. doi: 10.1037/0033-2909.84.5.888

Ajzen, I., & Fishbein, M. (2005). The influence of attitudes on behavior. In D. Albarracin, B.T. Johnson, & M.P. Zanna (Eds.), *The handbook of attitudes* (pp. 173-221). Mahwah, NJ: Lawrence Erlbaum.

Anderson, L., & Fricker, R.D. (2015). Raking: An important and often overlooked survey analysis tool. *PHALANX, 48*(3), 36-42. Retrieved from https://www.researchgate.net/publication/305215399_Raking_An_Important_Often_Overlooked_Survey_Analysis_Tool

Arant, W., & Benefiel, C.R. (2002). Hours of operation and service in academic libraries: Toward a national standard. *Public Services Quarterly, 1*(1), 71-85. http://dx.doi.org/10.1300/J295v01n01_08

Arias, I., & Beach, S.R.H. (1987). Validity of self-reports of marital violence. *Journal of Family Violence, 2*(2), 139-149. Retrieved from https://link.springer.com/journal/10896/2/2/page/1

Association of College and Research Libraries. (2006). But every other college library is open 24/7. *ACRLog*. Retrieved from http://acrlog.org/2006/11/20/ but-every-other-college-library-is-open-247/

Battaglia, M.P., Hoaglin, D.C., & Frankel, M.R. (2009). Practical considerations in raking survey data. *Survey Practice*, *2*(5), 1-10. Retrieved from http://surveypractice.org/index.php/SurveyPractice/issue/view/40

Bekkers, R., & Wiepking, P. (2011). Accuracy of self-reports on donations to charitable organizations. *Quality & Quantity*, *45*(6), 1369-1383. doi:10.1007/s11135-010-9341-9

Bowman, A.C. (2013). 24-Hour academic libraries: Adjusting to change. *Journal of Access Services, 10*(4), 217-239. http://dx.doi.org/10.1080/15367967.2013.842342

Bowman, R.L., & DeLucia, J.L. (1992). Accuracy of self-reported weight: A meta-analysis. *Behavioral Therapy*, *23*(4), 637-655. http://doi.org/10.1016/S0005-7894(05)80226-6

Del Boca, F.K., & Darkes, J. (2003). The validity of self-reports of alcohol consumption: State of the science and challenges for research. *Addiction, 98*(2), 1-12. doi:10.1046/j.1359-6357.2003.00586.x

Elen, M., D'Heer, E., Geuens, M., & Vermeir, I. (2013). The influence of mood on attitude-behavior consistency. *Journal of Business Research, 66*(7), 917-923. http://dx.doi.org/10.1016/j.jbusres.2011.12.011

Engel, D., Womack, K, & Ellis, U. (2002). Opening a library 24 hours. *Journal of Library Administration, 36*(4), 95-108. http://dx.doi.org/10.1300/J111v36n04_07

Gertheiss, J., & Oehrlein, F. (2011). Testing linearity and relevance of ordinal predictors. *Electronic Journal of Statistics, 5*, 1935-1959. http://dx.doi.org/10.1214/11-EJS661

Laaker, S. (2011). Keeping the doors open: Exploring 24-hour library access at Washington University in St. Louis. *Research Library Issues: A Quarterly Report from ARL, CNI, and SPARC, 277.* 15-25. Retrieved from http://publications.arl.org/rli277/26?ajax

Lawrence, P., & Weber, L. (2012). Midnight-2 a.m.: What goes on at the library? *New Library World, 113*(11/12), 528-548. http://dx.doi.org/10.1108/03074801211282911

Mingers, J. (2001). Combining IS research methods: Towards a pluralist methodology. *Information Systems Research, 12*(3), 240-259. Retrieved from http://web.a.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=2&sid=08da5903-54ca-4034-a889-6f47a618d921%40sessionmgr4010&hid=4201

Mingers, J., & Brocklesby, J. (1997). Multimethodology: Towards a framework for mixing methodologies. *Omega, The International Journal of Management Science*, *25*(5), 489-509. Retrieved from https://doi.org/10.1016/S0305-0483(97)00018-2

Ravenwood, C., Stephens, D., & Walton, G. (2015). Establishing influential decision making factors for university library opening hours: An exploratory UK regional study. *New Review of Academic Librarianship, 21*(1), 52-67. http://dx.doi.org/10.1080/13614533.2014.914960

Sanders, M., & Hodges, C. (2014). An overnight success? Usage patterns and demographics of academic library patrons during the overnight period from 11 pm-8am. *Journal of Access Services, 11*(4), 309-320. http://dx.doi.org/10.1080/15367967.2014.945121

Scarletto, E. A., Burhanna, K. J., & Richardson, E. (2013). Wide awake at 4 a.m.: A study of late night user behavior, perceptions, and performance at an academic library. *The Journal of Academic Librarianship*, *39*(5), 371-377. http://dx.doi.org/10.1016/j.acalib.2013.02.006

Smith, F. (2008). 24 hour service at Georgia Southern University: 1989-2007. *Journal of Access Services 5*(1-2), 69-83. http://dx.doi.org/10.1080/15367960802198226

Winship, C., & Mare, R.D. (1984). Regression models with ordinal variables. *American Sociological Review, 49*(4), 512-525. Retrieved from http://www.jstor.org/stable/pdf/2095465.pdf

Appendix
Survey Instrument

For almost five years, the Smathers Libraries have offered "overnight library hours" (that is, keeping one library open from 1 a.m. to 8 a.m. Sunday through Thursday), with funding from Student Government. The libraries, together with your Student Government, would like to get your feedback on where we offer overnight library hours during the 2016-2017 academic year. While both Library West and Marston Science Library will continue to provide extended hours during Reading Week and Exams Week, we are seeking your opinion about where the overnight library hours should be maintained.

You can take this survey anonymously or volunteer to participate in focus groups to discuss future library use studies by providing your email address which will be securely retained by researchers until December 31, 2016.

Your participation is completely voluntary and you can withdraw from the study at any time without consequence.

1. Prior to this survey, did you know that Library West and Marston Science Library have been open during overnight hours between 1 a.m. and 8 a.m.?

   - ☐ Yes
   - ☐ No

2. Have you used any either library during overnight hours between 1 a.m. and 8 a.m.?

   - ☐ Yes

- No

3. During the 2015-2016 academic year, how often have you used the Marston Science Library building during "overnight" hours between 1 a.m. and 8 a.m.?

- Never
- Once
- A few times
- Often (once a week or so)
- Very Often (more than once a week)
- Not Applicable (I was not at UF at that time)

4. During the 2014-2015 academic year, how often did you use the Library West building during "overnight" hours between 1 a.m. and 8 a.m.?

- Never
- Once
- A few times
- Often (Once a week or so)
- Very Often (more than once a week)
- Not Applicable (I was not at UF at that time)

For each of the following topics, please indicate which library you prefer during overnight hours

5. What materials or services do you use when you visit the library overnight?

- Technology (printers, scanners, computers)
- Materials (books, electronic resources, course reserves)
- Group Study Space (group study rooms, group seating space)
- Quiet Study Space (Silent/Quiet floors; Graduate study space
- Starbucks
- Power Outlets
- Assistance from Library Staff
- Other

6. Library Services (technology, materials, study spaces, Starbucks, library staff assistance)

- Much better at Library West
- Better at Library West
- Similar at both Libraries
- Better at Marston Science Library
- Much Better at Marston Science Library

7. Good Atmosphere for Study

- Much better at Library West
- Better at Library West

- Similar at both Libraries
- Better at Marston Science Library
- Much Better at Marston Science Library

8. Security inside the Library Building

   - Much better at Library West
   - Better at Library West
   - Similar at both Libraries
   - Better at Marston Science Library
   - Much Better at Marston Science Library

9. Security outside the Library Building (parking lots, walkways)

   - Much better at Library West
   - Better at Library West
   - Similar at both Libraries
   - Better at Marston Science Library
   - Much Better at Marston Science Library

10. Parking

    - Much better at Library West
    - Better at Library West
    - Similar at both Libraries
    - Better at Marston Science Library
    - Much Better at Marston Science Library
    - Not Applicable – I do not need to park

11. Close to My Residence

    - Much better at Library West
    - Better at Library West
    - Similar at both Libraries
    - Better at Marston Science Library
    - Much Better at Marston Science Library
    - Not Applicable

12. Now, please rank the importance of these ten areas with 1=Most Important, 2=Second Most Important, 3=Third Most Important etc.

    - Technology (printers, scanners, computers)
    - Materials (books, electronic resources, course reserves)
    - Group Study Space (group study rooms, group seating space)
    - Quiet Study Space (silent/quiet floors; graduate study space)
    - Starbucks
    - Power Outlets
    - Assistance from Library Staff
    - Other (3D technology, MADE@UF)
    - Security in the Library Building

- ☐ Security Outside the Library Building

13. For the next academic year, 2016-2017, would you prefer to have library overnight hours be held at Library West or at the Marston Science Library?

- ☐ I would prefer to have overnight hours at Library West
- ☐ I would prefer to have overnight hours at Marston Science Library
- ☐ I would be equally satisfied to have overnight hours at either Library

14. Please provide additional comments you have:
    _____

Please indicate your class standing

- ☐ Freshman/Sophomore
- ☐ Junior/Senior
- ☐ Masters
- ☐ Doctoral/Professional
- ☐ Post-Baccalaureate
- ☐ Faculty
- ☐ Other

Please indicate your gender

- ☐ Man
- ☐ Woman
- ☐ Transgender
- ☐ Other
- ☐ Prefer not to Answer

Please provide your primary area of study_____

If you are interested in participating in a group discussion about planning for future space and new services in the Smathers Libraries, we would love to include you in student focus groups later this year. Please provide an email address at which you can be reached and we will contact you when that study begins.

Email address _____

Thank you for your feedback!