Post-Occupancy Evaluation of the Arthur H. Dean Reading Room in Uris Library

Tal Gluck and Thomas Levine

I. Preliminary Site Analysis

A. Site

- Arthur H. Dean Reading Room
- Uris Library
- Kornelia Vassileva Tancheva, 106E Olin Library, kt18@cornell.edu
- We've obtained permission.
- Thomas Levine and Tal Gluck are working together.

B. Function

The majority of the room is devoted to study tables. There are some public computers in two locations. The circulation desk is also in this room. Because the stacks are accessed from one side of the room and the entrance to the library leads to the other side of the room, part of the room also functions as a corridor connecting the entrance of the library to the stacks.

I look at many user groups within these areas, but there are some user groups for which there are major differences across area.

Short people, including children and people in wheelchairs, may have difficulty using high desks intended for standing use, such as the standing computers and the circulation desk. They may avoid using such spaces or need to ask for special accommodations.

People using the library in the middle of the day may stay for shorter periods than people using the library in the middle of the night. This is because people generally have larger chucks of free time at night.

The time of day affects the general activity during the day, and the activity is concentrated at the northern and western ends of the room. If people want to study away from the activity, they will have to sit more to the southeast during busier periods like 1 pm than during less busy periods like 1 am.

Staff who need to move large things around the room, such as custodians emptying the trash, librarians reshelving books (There are some stacks in the room.) or information technology staff working with computers, will need wider aisles than most users. The same applies for people in wheelchairs or with walkers.

Study Tables

The study tables might be used for work that requires concentration. This may include reading, revising for exams, or problem sets that do not require computers. The desks are also quite large compared to the free area at the computer desks, making them helpful if someone wants to lay out lots of papers. The area is more closed, with less social interaction and fewer distractions. People who want a more open environment may look for tables rather than study tables and thus go to another room.

People who want to work on a computer in a in the study tables can work in the study tables but need to bring their own computer. People who want to work at computers in such an area but do not have their own computers have to go without the computer or move to the more open computer areas.

Computers

The computers are for any work that requires computers. Most computers workstations have chairs and indent users to sit, but some are high and without chairs and intend users to stand. People who know they will have to work longer at the computer may choose the sitting computers. People who will only be there for a little while (e.g. to check a few emails or look up a book) may choose the standing workstations.

Circulation desk

Library patrons mainly check out books at the circulation desk. This includes reserve books. They also ask about library information and receive other library services. Reserve books are stored there, and some library offices are connected to the area behind the circulation desk.

This is the primary area where staff will be found in the room, and the use of this space differs drastically between patrons and staff. Library staff work behind the circulation desk to help the aforementioned

library patrons. When they are not helping library patrons or doing other library work, they may busying themselves otherwise.

When checking out a book, a patron takes out his library card, presents the books and waits as the staff member performs a special procedure to register them as checked out. The two are working together on the same task but are performing drastically different actions.

Corridor

People walking from the main entrance to the stacks may walk through the corridor area in the room. On the way out, they come back through. Patrons may stop by the circulation desk to check books out.

People who want to study in the stacks can go through the corridor, up or down the stairs and into the stacks relatively simply, especially if there's a particular part of the stacks that they always study in.

People looking for books in the stacks may want to stop at a computer to look up the books on the way up. They may also want to see a map to figure out where the books are.

C. Comparative analysis

While the Dean room has the more fundamental components of a library study area and circulation desk, it differs highly from equivalent rooms in other libraries.

The Dean room differs strongly from many interiors in general through its size, access to green space and style of furniture.

The room feels much larger than most others on the campus, even the lecture halls and libraries. First, it truly is quite large. Second, it has a much higher ceiling than other libraries. Its large size, symmetrical and long shape and its architectural ornamentation are more reminiscent of a church. Third, almost all of its few stacks are against the wall, leaving the other space available to study.

Green space is not very visible within the Dean room. While some of the windows are quite large, they all start quite high above the floor, and there are alcoves with no windows. Because of this, it is difficult to see green space outside. Also, the color green is not used much inside the room, unlike in Mann Library and Catherwood Library.

The furniture in other spaces, particularly other library spaces, is more unified than it is in the Dean room. Many different styles of tables and chairs with many different finishes are used in this room, which gives it a weaker character than other rooms. The Dean room lacks an unified color scheme, unified materials selection and unified overall architectural style, which many other rooms have. In particular, library spaces tend to have a more unified style than other buildings on campus. Some examples are the Kinkeldey and the White rooms in Uris Library. In this case, it stands out particular strongly against other library spaces.

Compared the Dean room to other first-floor rooms in libraries raises differences in visual separations and in overall space use.

The more vital functions of the Dean room are quite similar to in the main first-floor rooms in other libraries. It has a circulation desk, some computer workstations, some non-computer workstations, printers, copy machines, access to stairs and an elevator and large circulation paths. Many related adjacencies are similar to those in other libraries on campus. The circulation desk is near the entrance. The copy machines are somewhat separated from the work areas. The reserve stacks are behind the circulation desk.

The room differs from first-floor room in other libraries and is more similar in some ways to deeper rooms in other libraries.

Rooms on the first floor of libraries and containing the circulation desk will generally have more activity and noise than those on higher floors. The Dean room has visual separations may make it feel less active to its users. Rooms on the first floor in other campus libraries do not have the same sorts of separations. There is less visual access in Dean room because of the orientation and type of furniture. There are study tables instead of tables, so it is harder to see the room and other people. Most of the computers in the Dean room face the wall or are in standing-height study tables, whereas most computers in other libraries are in islands like the rest of the Dean room's computers.

Compared to the first floors of Mann Library, Olin Library, Catherwood Library and the Math Library, the ratio of computer desks to non-computer desks is much lower. Almost all of the space in the Dean room is devoted to non-computer desks. It is more similar to the upper floors of Mann Library and Olin Library, where there are many study areas but only a couple standing computer workstations.

The Dean room is unique among interiors in general and is exceptional even among equivalent spaces in other campus libraries.

II. Preliminary Data Collection

Each of our two group members observed for two hours and conducted three interviews shortly after observing. One group member observed from 8:00 pm till 10:00 pm on a weeknight. It was raining at this time, and the library seemed less populated than usual. The other group member observed from 3:00 pm to 5:00 pm on a different weekday.

A. Informal user interviews

Each group member interviewed one patron at a computer, one patron in a study table and one staff member at the circulation desk.

Patrons

Three of the four patrons explicitly said that they preferred the Dean room or Uris Library because they were more easily able to find an available space there than they were at other libraries. The fourth patron was using a study table and had come from Olin Library to Uris Library because Uris Library was quieter.

Location was generally a strong factor in the decision to go to Uris Library rather than a different library. One computer-user said that she generally works in Uris Library, Olin Library, Mann Library or Catherwood Library, in that order of frequency. She said that she preferred Mann Library. but it was normally too far for her because she lives in Collegetown and normally has class in Rockefeller Hall. She also said that she sometimes has class on the Agriculture Quad. A study table user said location was the main criterion she used; when she wants to work, she generally goes to one of these four places,

based on which is closest: Uris Library, Robert Purcell Community Center, Mann Library or her dorm, a Townhouse. The other study table-user was the aforementioned user who came to Uris Library after retrieving a book from Olin Library, which is just across the street.

Computer user

Both computer users were working on graduate school applications. One mentioned that the light was much dimmer than he was used to, and that he would want the designer to redesign the lighting, even though he'd been on a computer.

We asked whether the users would use a study table if they had a laptop. One said that she would not use a laptop at a study table because they were too high; if she brought a laptop to the library, she would use it at one of the lower tables near the computers. She found even the computer desks to be too high, actually.

Study Table User

Both study table users were reading books. Both preferred not to sit right next to other people. One said he purposely chose to sit in an open row that nobody else was in. The other said she generally chose the first row that she finds with three adjacent spaces at the end. She likes sitting at the end of the study table, and she likes three spaces so she can spread out her work and belongings.

One user mentioned that he really like to have the study table wall in front of him because it keeps him focused on his work. This same patron mentioned that outlets near the study tables would make it easier for him to bring his laptop.

One of the study table users was the only patron to talk very positively about the table height. She felt that the table height was perfect for falling asleep. She liked it so much that she would prefer to take a nap at one of the study tables over taking a nap in an armchair in Mann Library, which she does as well.

Staff at circulation desk

When the staff at the circulation desk are not helping patrons, they generally do other library work. They often work at one of three workstations at the desk by using Remote Desktop to connect to their desk computers. They were generally pleased with the individual workstations. One specifically mentioned that the height was appropriate for him.

There are three standing computer workstations at the circulation desk. The staff members preferred the two workstations farther from the entrance. One preferred the one to the left because he found the chair to be more comfortable and less noisy, and he also liked to be next to the (non-functioning) grandfather clock. The other preferred the one to the middle because people come to that more and because it is easier for him to supervise student workers at this station. Neither preferred the one near the door. This was partly because the computer did not have a certain software package and because the monitor was too low. One of the workers said he mainly uses it when he needs to demonstrate something to patrons because it is easiest to turn that workstation's monitor such that patrons can see it.

One of the staff members said that the main complaint about the space from patrons was the deficiency of power outlets for laptops.

B. Unstructured observation

The Dean Reading Room tends to be a very quiet and nonsocial space. The only interactions that typically occur are at the circulation desk in front, and these interactions are not usually very loud. Sound does travel from outside, particularly when people are on cell phones immediately outside the door. Overall, it seemed that the loudest and most noise came from the printers, which were used frequently.

Lighting in the main area is more white/yellow, while lighting on either side (left and right - where the computers are and where the smaller study tables are) is more blue. Though one of the interviewees mentioned that they would have preferred the lights to be brighter, the lights did not seem particularly dim to us.

Circulation desk

Of the three workstations at the circulation desk, the one in the middle was most likely to be approached by patrons. Staff were rarely at the one near the entrance. If there were staff at the other two workstations, students would generally approach the far workstation only if the staff member at the middle workstation was busy helping another patron. This matches what the circulation desk users told us.

Computer areas

Standing computers

It appeared that almost everyone who came in to use the standing computers had either come from a study table or table and went back to that study table or table when they were finished, or went straight to the circulation desk from there. People didn't appear to use the standing computers for more than a couple of minutes at a time, though at one point a large group, coming from the stacks or a different floor, huddled around one computer for several minutes. At one point, two girls stood together to use a seated computer. They looked to be in a hurry, and it was unclear why they didn’t simply use a standing computer.

Standing computers’ keyboards and monitors were unusually low for most users. Users generally extended their elbows and wrists to about 135 degrees in order to use the keyboard. They generally flexed their necks about 30 degrees in order to see the monitors.

Sitting computers

The sitting computer workstations were nearly full during the afternoon observation, nearly half-full during the night observation. These proportions were quite stable within the observation periods.

Sitting computers’ keyboards were very high. Posture was more variable at these computers than at the standing computers, but substantial shoulder flexion of even 90 degrees was common.

Non-computer areas

Of the people seated at the non-computer areas (i.e. study tables or tables), about 1/3 were using laptops. There are very few electrical outlets in the area, and this appeared to be a frequent complaint based on the interviews.

There were curious seating patterns in the non-computer areas. Each row of study tables has space for four or eight users. In the afternoon observation, study tables were generally about one-fourth to one-third full. In the night observation, study tables were about one-eighth to one-sixth full, which may be an effect of the time of the observation, the rain or other factors. In the night observation, some study table rows had multiple people (up to four or five) who didn't appear to be together, while others only had a single person. The two users that we interviewed said they preferred not to sit next to other people, so it appears somewhat contradictory that some users choose to sit together. Also, in some of the study table rows, the chairs had not been replaced under the desks and were all out of alignment. In general, the study table desks are too high for normal use without strain.

III. Literature review (Thom)

Citations in text and a bibliography are expected. No outside sources are required. You may rely on course readings. It is fine to bring in outside sources but not required. It's fine to share resources among your group, but you need to write this section on your own.

Design issues

Lighting

Some patrons felt that the lighting was too dim. This is a concern because it can affect both visual strain and overall posture (Galer, 1987, page 130). Appropriate levels of light are 200 lux for general use(Galer, 1987, page 125; Wilson & Corlett, 1995, page 160) and 500 lux for office use (Wilson & Corlett, 1995, page 160).

Anthropometric fit

Our observations and interviews found problems of anthropometric fit between people and the workstations. In particular, the heights of desks, chairs and computer monitors were not appropriate for the users. Galer (1987, page 91-4) recommends the following.

- seat height be no greater than the length of the lower leg
- perceptual-motor tasks be performed with a work surface at or just below elbow height

Adjustment in these dimensions must also facilitate an appropriate eye position (Galer, 1987, page 91).

Environmental dimensions

Stimulation levels

Stimulation is the "amount of information in a setting or object that impinges upon the human user" (Evans & McCoy, 1998). Too little stimulation can cause boredom, and too much can cause distraction and stress (Evans & McCoy, 1998).

Stimulation can be adjusted through intensity, complexity and novelty of a stimulus (Evans & McCoy, 1998). Loud noises or bright lights create intensity and increase stimulation (Evans & McCoy, 1998). Spaces with varied non-cohesive elements have high complexity and increase stimulation (Evans & McCoy, 1998).

Library patrons typically go to the library to perform cognitive work, such as reading and writing. This sort of work provides much stimulation in itself, largely because of the complexity of the work. Because of this, it makes sense to reduce stimulation in the environment in order to avoid overstimulation, which may distract patrons from their work.

Coherence

Coherence is the "clarity or comprehensibility of building elements and form" and allows users to deduce the "identity, meaning and location of objects and spaces inside of buildings" (Evans & McCoy, 1998). Coherence is increased through repetition, expression of rules, thematic continuity and legibility (Evans & McCoy, 1998). It is decreased through complexity and ambiguity about behaviour (Evans & McCoy,

1998).

Low coherence can increase stress (Evans & McCoy, 1998), so it is important that spaces be coherent. Coherence is particularly relevant to reading rooms because of their high use by the public, who may be unfamiliar with the space. Two particular considerations are legibility and cues about appropriate behavior. Legibility is the "ease with which one can comprehend the spatial configuration of an interior space" and is related to the ease of wayfinding (Evans & McCoy, 1998). Legibility will be particularly relevant to library patrons who are not familiar with the space. Because they are unfamiliar with the space, library patrons may have to learn what sorts of behavior are appropriate in the space, and much of this learning will come from the environment. It is important that cues about the behavior be unambiguous to reduce stress.

Affordances

Affordances help users understand the functions of spaces and objects (Evans & McCoy, 1998). Misaffordances occur when functions are not well conveyed may lead to frustration, annoyance, hostility, helplessness and accidents (Evans & McCoy, 1998). Ambiguous or conflicting information and vague or missing cues can create misaffordances. Designs with little feedback can also lead to negative feelings (Evans & McCoy, 1998).

Affordances exist in all parts of the space but may be more relevant in less typical elements of the space. For example, misaffordances may be a relatively small issue at the long tables where library patrons bring their own books and laptops. There may be a strong affordance for how to sit in a chair at a desk and what to do with their books or laptops. Misaffordance may be more relevant in the design of

computer workstations, which older users may be less familiar with, in the design of certain features of the circulation desk, which are not common outside libraries, or in the design of doors (Evans & McCoy, 1998).

Control

Control is the "ability to either alter the physical environment or regulate exposure to one's surroundings" (Evans & McCoy, 1998). Uncontrollable spaces can lead to helplessness (Evans & McCoy, 1998). Control is influenced by "insufficient spatial resources, inflexible spatial arrangements, and lack of climatic or lighting controls" (Evans & McCoy, 1998).

One aspect of control very relevant to the Dean room is privacy. Privacy is the "ability to regulate social interaction" (Evans & McCoy, 1998). We found in interviews that patrons generally went to Uris Library rather than Olin Library because they could find space there. These patrons have control of their degree of social interaction by moving to a different room.

Patrons could also achieve regulate their environment by moving barriers and furniture (Evans & McCoy, 1998), but it does not appear that patrons move barriers or furniture in the Dean room. Control may be increased through the inclusion of movable furniture and barriers.

Being in a library, the Dean room is a quiet space. Socialfugal furniture arrangements, which discourage social interaction (Evans & McCoy, 1998), may thus be preferred. Because socialpetal furniture arrangements would be less common, patrons need the ability to move to more socialpetal spaces in order

to have control.

Library staff are less able to regulate social interaction because their job dictates their location. They thus need to be able to alter their environment in order to have control over their environment.

Restoration

Restorative spaces have reduced sources of stress, such as cognitive fatigue, and provide a way to cope with stress in other parts of the environment (Evans & McCoy, 1998). Retreat and fascination provide restoration. Retreat to areas of reduced stimulation offset the high-stimulation areas and reduce stress (Evans & McCoy, 1998). Voluntary attention, such as reading, increases mental fatigue (Evans & McCoy, 1998). A space with involuntary attention, or fascination, reduces mental fatigue. Exposure to nature is one form of involuntary attention.

Much of the work performed by patrons and staff involves voluntary attention and stimulation, especially when a computer is involved. Even if the work does not involve less as much attention and stimulation, retreat and fascination can be beneficial. Many of the staff and patrons are busy students, so they are likely to have high stress and cognitive fatigue before the enter the library, so the library can function to some degree as a place of restoration.

One of the staff that we interviewed expressed a preference for one of the workstations at the circulation desk because it was next to an old, non-functional grandfather clock. The Dean room contains many features like this that may reduce the cognitive fatigue and thus recharge users for more mentally involved

activities. Because the windows are so high in the room, there are few views of nature within the space. Fascinating elements of the space may substitute, however, for the lack of views of nature.

Defensible space

Defensible space has the goal of increasing user control of a space and reducing crime (Newman, 1996). It is particularly relevant to the library because of the prevalence of thefts in the library. This prevalence is evidenced by the many signs posted around the library warning patrons not to leave their belongings unattended. A more defensible library space may make it safer for patrons to leave their belongings at a desk when they get up for a few minutes.

Defensibility may be increased by increasing visibility of library spaces. This would discourage thieves from stealing as it would be more difficult for them not to get caught. This would make others feel safer as it would be easier to notice thieves.

Defensibility may also be increased in spaces with fewer entrances and exits. It housing developments, having fewer people share one exit improves defensibility because it becomes easier to remember whether people belong there (Newman, 1996). People don't live in libraries, but this may still apply for areas where people are working for long periods of time.

Defensible space may also be related to maintenance of a space. Territoriality can affect defensibility. As more people have a claim to a space, the strength of their claim decreases (Newman, 1996). As this decreases, they feel less control over the space (Newman, 1996). If they feel less of a claim to the space, they may be less likely to clean up after themselves.

References

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III. Literature review (Tal)

There are two main design issues and challenges to take into account when redesigning the Dean Reading Room in Uris Library:

History

The Reading Room and Library are over 100 years old. There is a lot of history associated with them, and a lot of traditions and habits as well. Therefore, it seems as though the changes can't be too drastic, and whatever changes are made need to fit with the current aesthetic. It also means that certain important changes that are more structural in nature, such as electricity (one of the major complaints from the users was that there weren't enough outlets), lighting, etc. might be difficult to get approve and to carry out. As well, the library staff seems to want to maintain the Reading Room as a reading room, and so even though

some of the users might prefer to turn it into more of a computer room, it is important to take the opinion of the decision makers into account, and figure out how more use could be gotten out of it as a reading room.

Processes

The Dean Reading Room is also home to the Uris Library circulation desk. Thus, the design changes need to take into account that there will be frequent traffic and moderate levels of conversation. A room like the Kinkeldy Room, for instance, another room in Uris Library which just functions as a reading room, would be easier to design, as it would only be necessary to worry about quiet rather than conversation. Here, however, more functions and user groups need to be taken into account. It is important to note that this extends not only to the finished design, but also to any construction or changes that might take place, as this would effectively shut down the circulation for Uris Library.

Environmental Dimensions to be Addressed:

Stimulation

Evans and McCoy (1998) describe stimulation as "the amount of information in a setting…that impinges upon the human user." Stimulation is an extremely important dimension to be addressed for the Reading Room, as it is designated as a quiet space for reading and study. Thus, stimulation should be kept to a minimum (though, of course, lighting must be adequate) to ensure that users should not be distracted from their work. However, as mentioned above, there are processes in the room, such as conversations around

the circulation desk and printers, that do provide noise stimulation. Something that will be addressed later on in this project is whether this noise is wanted or unwanted, as small distractions might be helpful for study (rooms shouldn't be "too quiet").

Coherence

Evans and McCoy (1998) describe coherence as "the clarity or comprehensibility of building elements and form." This is not such an important dimension to consider for the primary users of the space, as their use of the space is quite simplistic, and the space has a lot of visual access. However, from a historical standpoint, as mentioned above, coherence does play a role, as the aesthetic of the space must adhere to a higher standard.

Affordances

Evans and McCoy (1998) as that which makes us able to use an object or space properly. Because the primary use of this space is simplistic, and because the zones in this space are flexible (i.e. the computers and desks may be used by anyone) this doesn't seem to be a prevalent issue, though it is important that users recognize the overall space for its primary function as a quiet, individualized-study area.

Control/Privacy

Evans and McCoy (1998) define control as "mastery or the ability to either alter the physical environment or regulate exposure to one's surroundings," and privacy as "the ability to regulate social interaction" which is "a major contributor to a sense of control in interior settings." Control and privacy are important

dimensions of the space, as it is important that the users feel comfortable using the space. Moreover, in spaces where choice is limited, stress might be exacerbated (Glass & Singer, 1972; Evans & Cohen, 1987) which would certainly be a problem for a study space. The Reading Room already allows some privacy by offering different seating options. Users can sit at desks with dividers and walls in front of them, or at tables with no dividers. Additionally, because the library tends to be underpopulated, the users have a lot of control over where they sit (which affects not only privacy but access to adequate spatial resources, which Evans (1979) says is fundamental for the moderation of crowding effects). However, the goal is for the space to not be underpopulated, and so issues of control, privacy, and spatial resources will need to be reevaluated.

Restoration

Evans & McCoy (1998) define restorative quality as "the potential of design elements to function therapeutically, reducing cognitive fatigue and other sources of stress."This is an interesting dimension when it comes to the space. The primary intended functions of the space identified by Thomas and me were reading, studying, book circulation functions, and computer use. However, one of the users interviewed mentioned that she really liked the tables because they were just the right height for napping. It might be important to facilitate functions, such as resting or napping , in moderation, in order to reduce stress while studying. Additionally, restorative areas might be one way to cope with privacy and control if and when the Reading Room's population does increase. Wachs & Gruen (1982) found that having spaces to retreat to might buffer the negative impacts of crowding and noise. Perhaps some of the Reading Room, or one of the adjacent rooms, can be designated as a restorative area if the need arises.

Other amenities

After speaking with students who have used the Dean Reading Room for several years, it was pointed out that the Reading Room used to be much more popular when Uris Library still had its own café. Amenities like cafes and laptop rentals might drastically affect the population. This is particularly evident when comparing different libraries within Cornell's Library system with one another – those with cafes seem to attract a lot more users.

Site

Uris Library has been there for a very long time, and so it is unlikely that the site will change all that much. However, the main issue with siting is the view out of the windows. The Reading Room has large windows, and what is seen outside of those windows, as well as how much light comes in through those windows is important – it plays into both stimulation and restoration, and can really affect homeyness (another major factor of restoration) (Evans, 1979).

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IV. Method and Results

We assess these concerns with the interview

- Lighting
- Stimulation
- Control/Privacy
- Defensible space
- Restoration
- Other amenities

We administered the questionnaire at the main rooms of

- Uris Library (Dean Room)
- Olin Library
- Mann Library
- Catherwood Library

We received 34 responses.

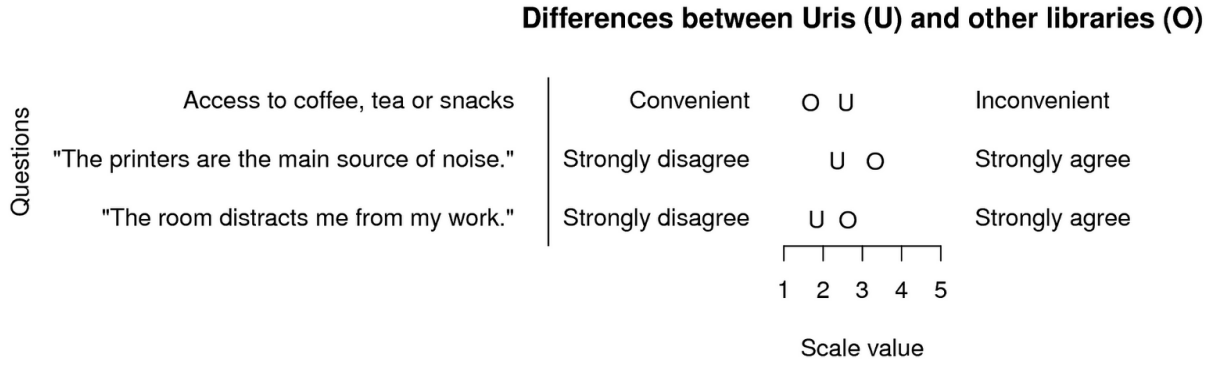
A. User Questionnaire

General responses

The general responses showed a number of things. Some of the more interesting ones: 50% of respondents said that accessibility to food was an important feature of the library. More than 75% of respondents said that when they needed a break, they would most likely leave the room they were in, or even the entire library. For all of the libraries, noise did not seem to be that much of an issue, though, for Uris Library, the printers were considered to be the primary source of noise. Of the 34 respondents in 4 libraries (2 in Catherwood, 9 in Olin, 11 in Mann and 12 in Uris) asked about which was their favorite library, 5 replied Catherwood, 10 Olin, 10 Mann, and 9 Uris.

Differences by library

For some questions, we compared the results by library.[1] For three questions, there were significant differences between Uris Library and the other libraries. They are presented below.



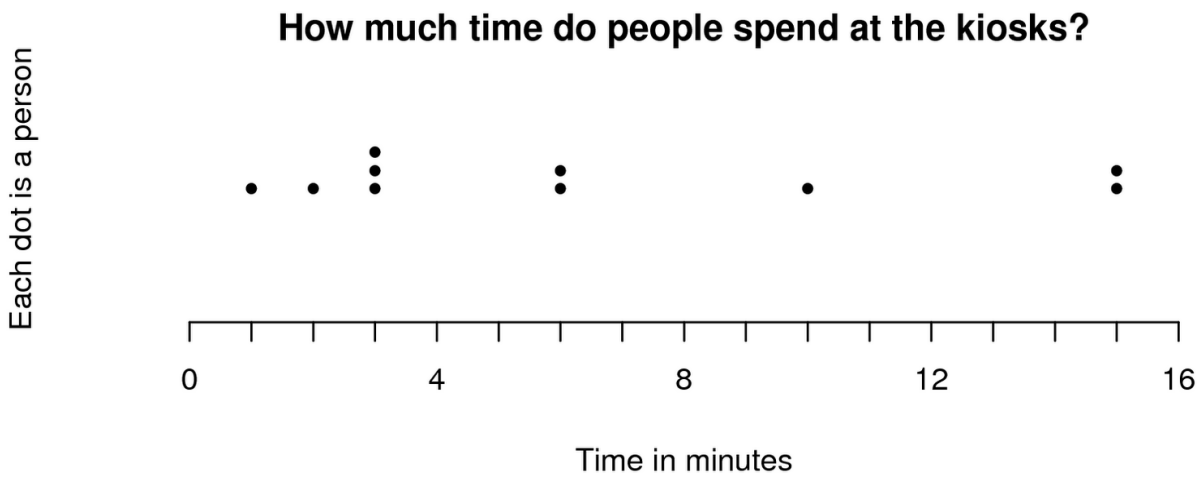
[1]We used *t*-tests to assess differences between libraries. This test isn't totally valid because the sample size is small enough that the assumption of normality of sample means may not hold.)

The first of questions in the chart above measures the convenience of access to food in the library. It was less convenient in Uris Library than in the other libraries. The second of these questions was intended to measure whether the printers were the main source of noise. We think that it may actually have measured the overall noise level, which we were already quite confident was much lower in Uris. The third of these questions was intended to measure the stimulation level. The Dean Room was less stimulating than other library main rooms.

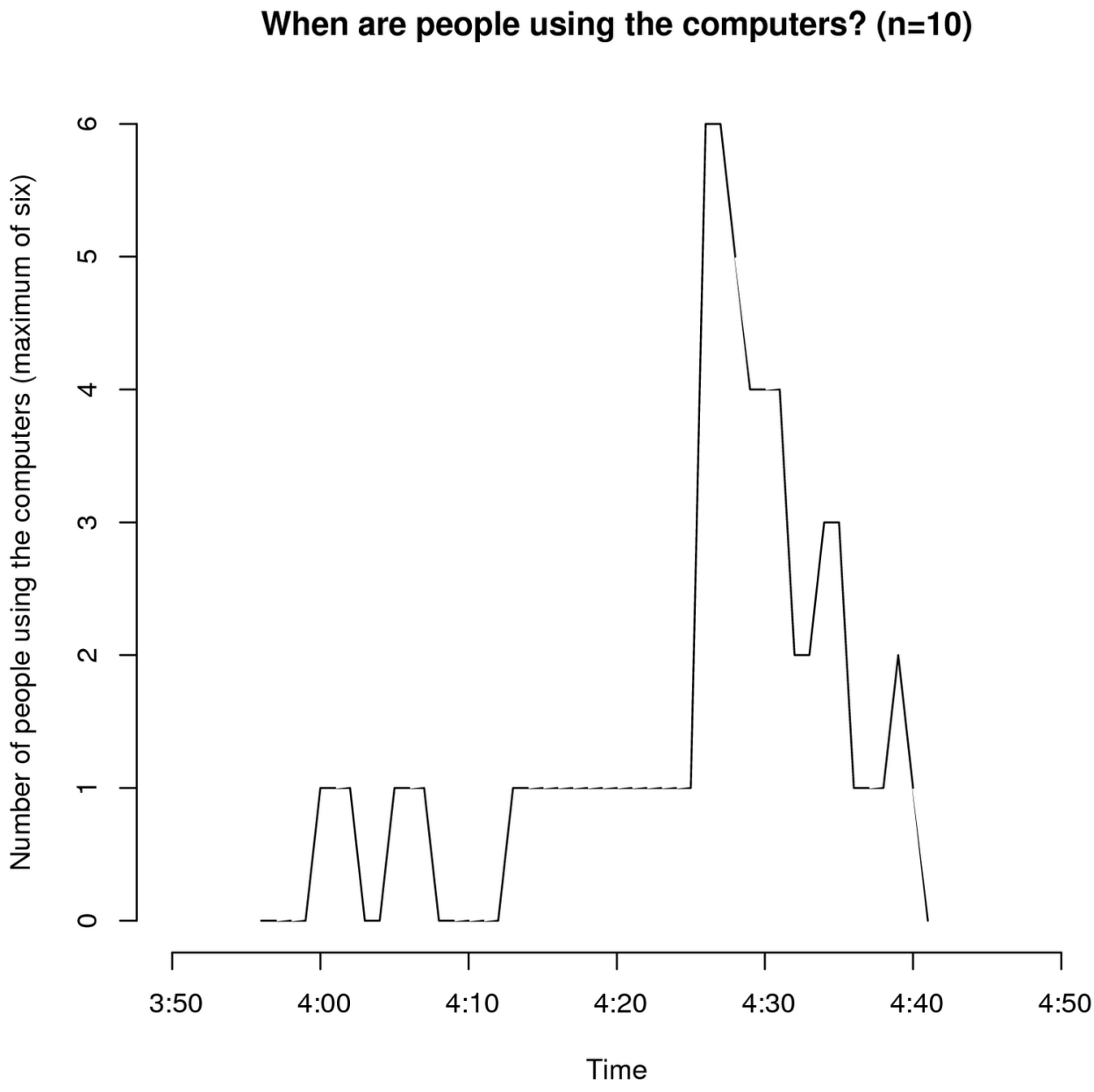
B. Formal Observation

Behavior Mapping, October 13

We observed the circulation desk and the standing computers near the circulation desk on October 13 from 3:56 pm to 4:39 pm. For the standing computers, we recorded the time (to the minute) when each computer-user arrived and the time when she or he left. Based on this, we were able to see how long people spent at the kiosks and at what times the use peaked.



The distribution of time spent per person was skewed; most people spent a very short time at the kiosks, but some spent a longer time. The mean time spent at a kiosk was 6.4 minutes, and the median time spent was 4.5 minutes.



The six standing computers were generally not in use, but their use peaked suddenly shortly after 4:25 pm, which is when the last classes of the afternoon end.

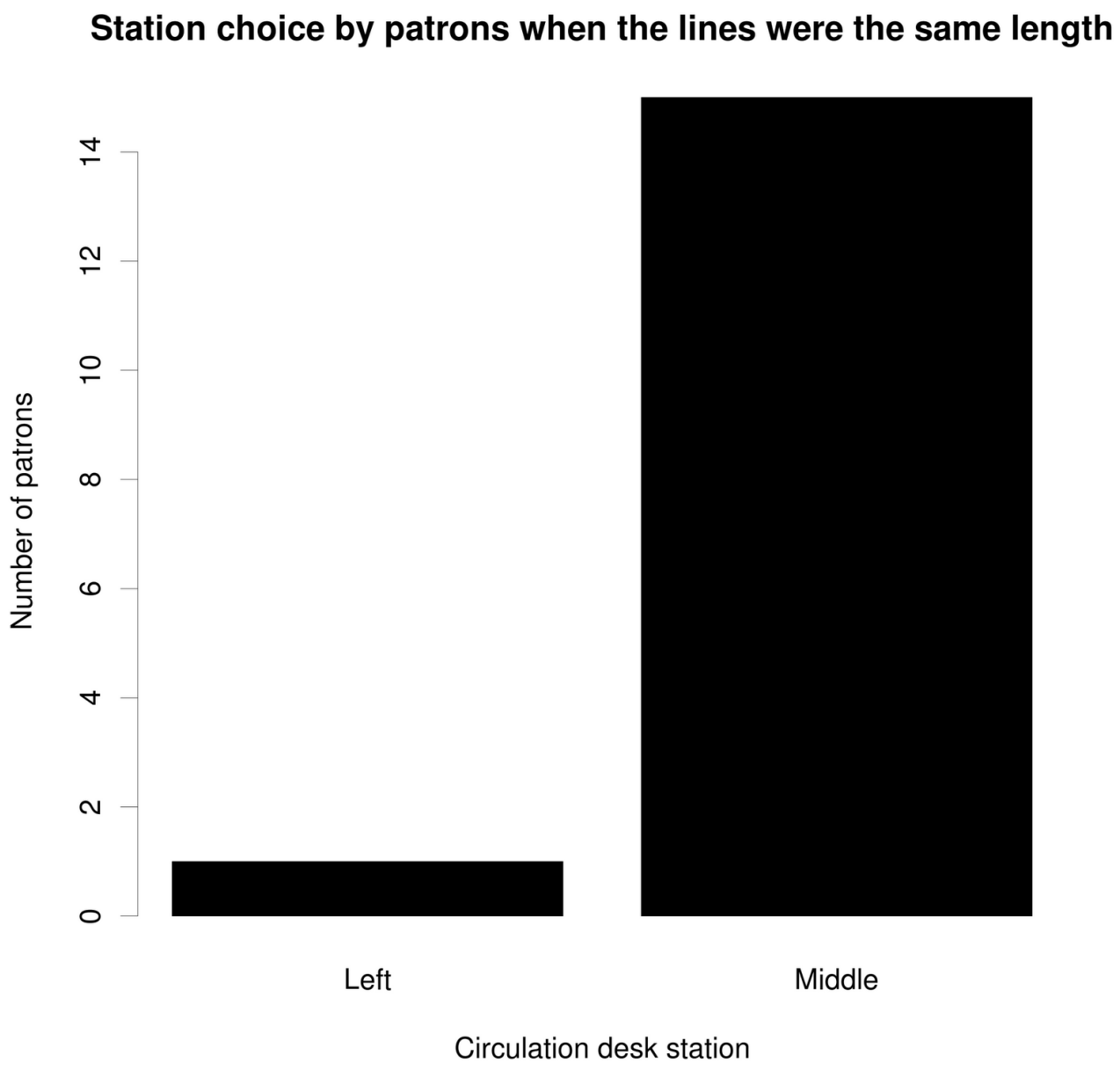
For the circulation desk, we made a record for each instance of a patron went to the desk. For each of these instances, we recorded

- Time to the minute
- Which of the three circulation desk stations were staffed
- Lengths of the lines at each of the three stations
- Which station the patron approached

Within the observation period, 31 patrons approached the circulation desk. One person used the book drop. Everyone else interacted with a staff member at one of the three stations.

For a period of 14 or 15 minutes, there was no staff member at the left station. Eight patrons approached the desk during this time. For the other 23 patrons, the left and middle stations were staffed. The line got no longer than three people for one desk during the observation period. In total, four people had to wait on line over the observation period.

For 16 patrons, both stations were staffed and the lines at the two stations were of the same length. When the lines were of equal length, 15 patrons approached the middle desk and only one approached the left desk.



Behavior Mapping, December 3

Circulation Desk

The circulation desk is where book circulation takes place. Library patrons interact with library staff to check out books, return books, or ask questions reference questions. There is some noise generated from

this area, but it generally seems to be unobtrusive, perhaps based on the location of the Circulation Desk, and acoustics of the space.

The Circulation Desk does get used by library patrons, though it certainly does not seem busy. During one of the formal observations, on a Friday afternoon, ten interactions occurred in a two-hour period. All of these interactions occurred between patrons and staff (though when there are no patrons, staff will sometimes chat amongst themselves). The patrons range from what appear to be students (both undergraduate and graduate) to apparent faculty and community members. Gender, race and age don't appear to be salient issues when it comes to the patrons (or any of the users of the space listed below). Generally, interactions don't last more than a few minutes, and often they are even shorter than that.

Computer Area

The computer area can actually be divided by two different factors - location and type. Computers are located directly at the front of the Reading Room, as well as off to one side. There are also two types of computer workstations - standing and seated. There are both standing and seated computer workstations at both computer locations in the Reading Room.

During observation times, nearly all of the seated computers were full (on the front and on the side). When one seated computer user left, his/her spot was usually filled within a few minutes. Also, the seated computers in the front had a faster user-turnaround rate than the seated computers on the side.

The standing computers rarely had more than two people using them simultaneously, and usually had one person using them. The turnaround rate on the standing computers is generally quick - the computers are just used for a few minutes (and then the user either leaves, or returns to the reading area to do non-computer based work). However, periodically, there are users who use the standing computers for longer

periods of time (closer to 15 minutes). The users of the computer area all seemed to be students (judged by appearance of age).

Reading Area

The Reading Area is made up of 1) rows of sectioned tables in the middle, 2) open, unsectioned tables on the side near the side computers, and 3) rows of sectioned tables with shelves on the other side of the Dean Reading Room. The 3rd section of the reading area tended to be the least concentrated, given the number of available seats. It had between 0 and 3 people at any given time. The 2nd section also had 0 and 3 people, but usually each of the open tables had one person sitting at them, so they seemed more concentrated/populated. The 1st and most primary section of the reading room - the rows and rows of sectioned study tables in the middle of the Dean Reading Room usually had between 8 and 15 people.

The seating arrangement here was peculiar, with some rows just containing one person, while others contained 3 or 4. Generally, people sat within three seats of the end of the row, though, on occasion, this varied. People almost never sat next to each other, and rarely even sat two seats over from another. People in pairs, however, broke this rule, sitting one or two seats apart from one another. There did not appear to be any groups larger than two people.

In the Reading Area, people tend to do reading/studying. There were a surprisingly large number of laptops, however, considering there are almost no outlets within reach of the tables. Sometimes people do handwriting as well, but the primary activities in the Reading Area are reading and laptop use.

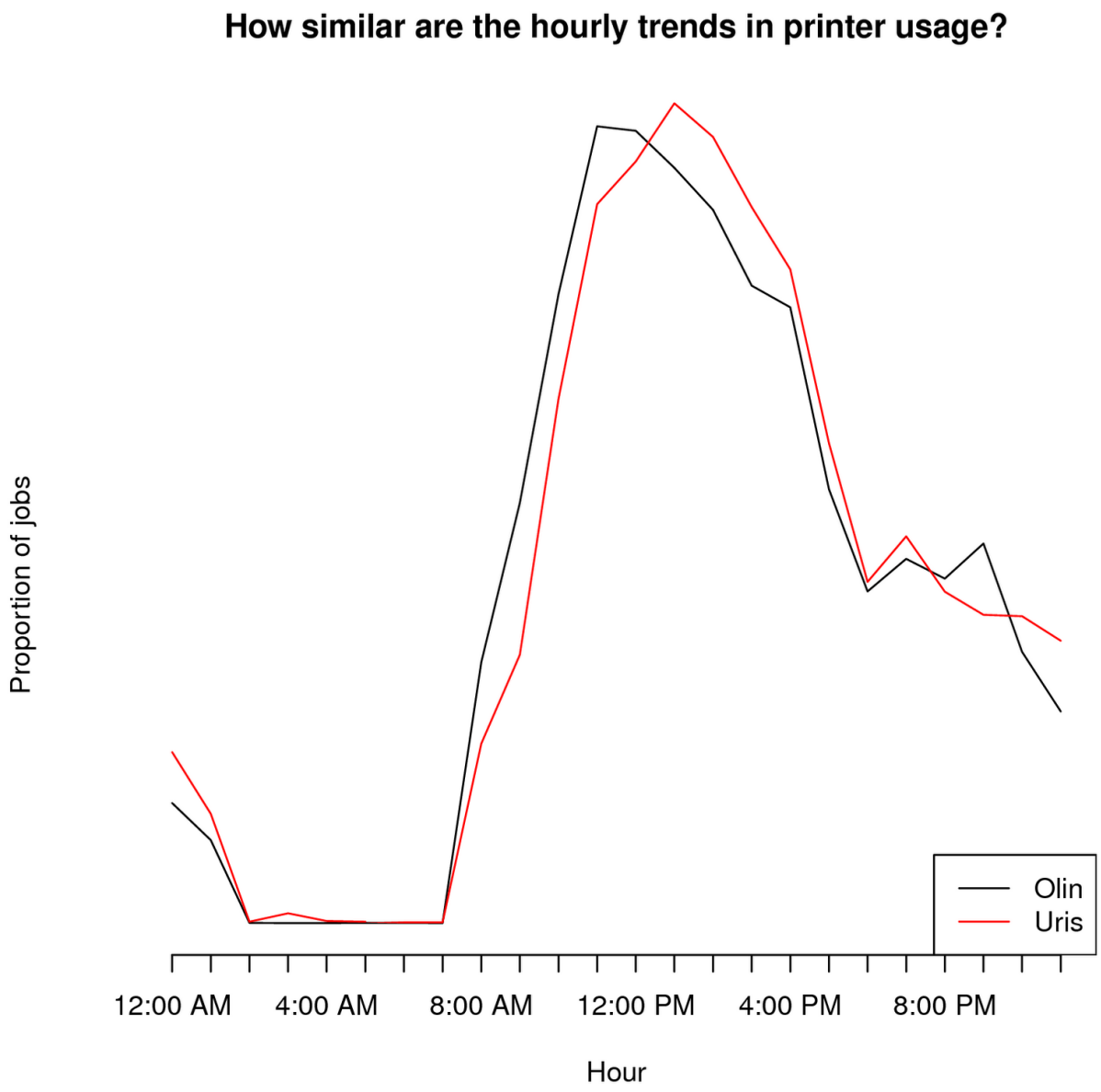
Traces

There did not appear to be major signs of accretion or erosion. Uris Library is rather old, and so is much of the furniture and carpeting, but not an indicative way. The computers also all seem to be well-maintained. However, a few traces did stand out. The fact that the shelves in the 3rd section of the reading area were all empty is indicative of under-use.

Another significant set of traces was the presence of unattended belongings. There were three separate sets of belongings that appeared to be unattended by their owners. This is particularly interesting because item theft has been an issue in the past. Another factor was how people's belongings were spread about them as they worked. Generally, people kept their items all within their divided section of the study table table. However, in a couple of instances people expanded, placing their belongings in neighboring sections of the study table table. This might indicate a lack of individual storage space for each seat. However, if people were sit at the tables with the shelves, then they would have this storage space. This indicates that there must be something else preferable about the middle section of tables.

A third trace is the disarray of the chairs at the tables in the Reading Area. It is not clear what this is indicative of, but the fact that the chairs have never been neatly located under the tables during any of the observations is interesting.

C. Archive data



We used printer use as a measure of activity level in the room. We acquired counts of the number of jobs sent per hour to the printers in the Uris Library Dean Room and the main room on the first floor of Olin Library, across the street from Uris Library. The data span one week. Over the week, 29306 jobs were sent to the Olin Library main room's printers and 11650 were sent to the Dean Room printers. While this is a marked difference, the trends over the course of the day were very similar between the two rooms.

Discussion (Thom)

Circulation desk

Circulation desk activities currently run reasonably smoothly but somewhat inefficiently. This does not seem to be a major issue today, but it may become an issue if the library and room start getting used more.

There are three computer stations at which staff can stand at the circulation desk. I'll refer to these stations from the perspective as the patrons as the left, middle and right stations. The staff prefer the left and the middle stations over the right station. Because of this, they rarely use the right station. If it does become necessary to use a third station, however, staff will have to use this one, which may be more difficult or less convenient for them. Patrons generally approached the middle station rather than the left station if both were available. This may be because it was more visible than the left station.

The station preference seems to differ between staff and patrons. Some staff preferred the left station, and some preferred the middle station, but patrons almost invariably used the middle station. First, this may mean that the preferred station differs by user group. Second, this may mean that the staff member working at the middle station has to do more work than the other staff members.

Sitting Computers

Compared to other areas of the room, the sitting computer area is used more frequently. This may be partly because work nowadays tends to be more on the computer than in the past. Also, the Dean Room has proportionately fewer computer workstations than other libraries' main rooms. While the computers are used relatively frequently, the computer workstations have still do not suit their users particularly

well. The aesthetic of the furniture does not match that of the rest of the room, which may reduce coherence and increase stress (Evans & McCoy, 1998). They also have anthropometric issues, which will be discussed later.

Standing computers

The standing computers were generally used for only short periods of time and only seem to fill up at peaks like changes between classes. It thus seems that they are functioning well as quick kiosks for library research and the like.

Study tables

The study tables constitute the majority of the space and are normally mostly empty. This may be partly because schoolwork is moving away from paper-based work to computer-based work. Also, while students can use laptops on the study tables, the tables are far too high to be appropriate for laptop use. (This issue will be discussed later.) Finally, there are very few outlets in the room, so laptop users generally have to rely on their laptop batteries to work in this room.

Anthropometric fit

The heights of the furniture is very inappropriate in the space; the chairs are generally far too low. The sitting computer tables and the study tables are far too high for computer work. It may be that the furniture was originally purchased for non-computer work. Based on the guidelines put forth by Galer (1987, page 91-4), the following heights should be appropriate.

1. The height of the seat should be no greater than the length of its user's the lower leg.
2. The desk should be at or just below elbow height.
3. The monitor should be raised somewhat above the desk to support an appropriate eye position.

Desks that are too high and chairs that are too low are common issue in many buildings, but we observed especially awkward postures corresponding to especially high desks and low chairs in the Dean Room. Users also suggested that this may be a larger issue in the Dean Room than in other library rooms. Also, note that furniture often needs to be adjustable for each user in order to fit a wide range of people and that fixed furniture is likely not to suit all users very well.

The standing workstations had slightly different size issues. Their table height was lower than Galer's (1987, page 91-4) recommendation of elbow height, and the monitor height was much lower than eye level, so people had to flex their necks to have an appropriate view the screen (Galer, 1987, pages 91-4). Because the standing workstations are used for such short periods of time, however, anthropometric fit is less important for them.

Environmental Qualities

We identified a few environmental qualities of particular interest to the study and design of the Dean Room. They were lighting, control, access to food, stimulation/privacy, defensible space and restoration.

Lighting

Lighting was varied through the room, so certain parts have better lighting than others. A level of 500 lux is recommended for office use (Wilson & Corlett, 1995, page 160). Some users reported that lighting was too dim in the space. It seems that some parts have too little light, but it does not seem to be a section with too much light.

Control

Like in most libraries, patrons have control of their space almost exclusively from their ability to move around; they reconfigure the space little. Our questionnaire suggests that patrons generally exert control

in libraries by leaving the library or moving to a different room rather than by adjusting their current workspace. Situating varied environments near the library or in other parts of the library may improve the sense of control within a particular room of the library. Because patrons generally switch locations instead of adjusting the area around them, it may be more natural to provide many varied spaces rather than providing variety within one space.

Staff, on the other hand, have less control over their location. It is thus more important that they be able to modify their workstations. One staff member indicated that he chose the station at which he worked based on its proximity to a non-functional grandfather clock. Improving his ability to adjust the workstation may have allowed him to satisfy the need met by the clock without moving his workstation.

Access to food

Unlike Olin and Mann Libraries, which have cafés in the same buildings, Uris Library's closest café is across the pedestrian street in Olin Library. The questionnaire indicated that the Dean Room had less convenient access to food than the other libraries' main rooms. The questionnaire also indicated that convenient access to food was important to library users. Improving the access to food to Uris Library patrons may thus increase the use of the Dean Room.

Stimulation

An environment that is less stimulating helps an occupant focus on one task (Evans & McCoy, 1998). It may thus seem that reading rooms should be unstimulating. On the other hand, the nature of work may be changing, partly through the use of computers, such that a more stimulating environment is preferable. Our questionnaire indicated that the Dean Room was less stimulating than other, more popular libraries' main rooms. Increasing the stimulation in the Dean Room to match the level in other libraries may increase its popularity.

Privacy is a particular type of control that is especially related to stimulation. It is the ability to regulate social interaction (Evans & McCoy, 1998). While it is less isolated than the stacks, the Dean Room is a more isolated space than other library main rooms, partly because of the partitions along the tables and the low light conditions, which reduces the stimulation that one receives from others. The Dean Room is thus more appropriate when people want to be more alone but is less appropriate when they want to be with other people.

Defensible space

Defensibility of space does not seem to be a major issue in the Cornell Libraries. Our questionnaire suggests that most people in all of the libraries feel comfortable leaving their belongings unattended. This may indicate that the building has strong defensibility, but it may also be an indication of a larger culture of trust in leaving belongings unattended throughout the Cornell Campus.

Restoration

Restoration through involuntary attention can be used to take a break from the voluntary attention involved in work (Evans & McCoy, 1998). Because we found that people generally switch locations when they need to take a break, I do not think that it is important that libraries have restorative spaces for patrons as long as patrons can conveniently access nearby restorative space.

The Dean Room may be a particularly restorative space, and this may be a disadvantage. It has many homey elements, including wooden furniture, paintings, fireplaces and more traditional architecture, which may make it more restorative. Also, sleeping was unusually common in the Dean Room, which may indicate that it is particularly restorative. While restoration is important, the library management should consider where it would like restorative activities like sleep to take place; for example, it may prefer that sleep occur in a less public room. Rooms can be designed with this in mind to encourage restorative activities where the management desires them and to discourage restorative

activities where the management does not desire them.

Discussion (Tal)

For the discussion of our findings and how well aspects of the library do or don't work, we included not only the major activity areas in the Dean Reading Room, but certain general factors about the library. We will primarily discuss the library patrons here - though library staff is certainly an important user group to consider, based on our interviews and observations, the staff members generally seemed to be satisfied. The circulation desk interactions occurred smoothly, and staff members appeared to be doing their jobs well. So as we progressed further in this study (for the questionnaires and some of the structured observations), we focused less on the staff and more on the patrons

Though the library patron users of each of the three spaces did have different needs, one person would often use two or three of the different areas. Thus, there didn't seem to be any personal user differences (gender, age, race and so on) past the user's immediate needs in their own space, and we can generalize some of the findings for all three user groups.

One final note: we distributed questionnaires not only in the Dean Reading Room of Uris Library, but also in the reading rooms of Olin, Catherwood, and Mann Libraries. All of the questionnaires were distributed in reading rooms that were located just inside the main entrance of their respective libraries, and each one had a circulation desk located within the reading room. The comparison between these different libraries yielded some interesting results which will be discussed below.

Circulation Desk

As mentioned above, based on interviews and observations, the circulation desk of the Dean Reading Room operated smoothly. Though the Circulation Desk does generate much of the noise in the room,

the location and the acoustics of the room render the noise unobtrusive - in the questionnaire, the Dean Reading Room was rated the least distracting out of all of the reading rooms. All in all, this area of the library functioned well.

Computer Area

The computer area appeared to be quite functional as well. The seated computers were the only consistently full areas in the library, while the standing computers were generally full at peaks, and did get consistent, if slower, use at other times. Otherwise, users tended to spend a long time at the seated computers doing work, which implies that the workstations themselves must be satisfactory. It might be beneficial to have more seated computer workstations - in the initial interviews as well as the questionnaires users identified that accessible computers were a main reason why they went to Uris Library.

During observations of the Reading Room, the printers appeared to be the main source of noise, and the questionnaire results corroborated this. However, Uris Library was also labeled as the least distracting library, so though the printers do generate the most noise in the space, this might not be an important factor. Overall it seems that the benefit of having the printers outweighs the cost of the noise that they generate.

Reading Area

Of the three main areas in the library, this was the least successful. On average, only a small percentage of the seats in the Reading Area were in use, and there were frequent complaints about the lighting, in both interviews and the questionnaire. Most of the tables are not the right height for laptop computers,

and, anyway, there is a lack of outlets for personal use in the room (another frequent complaint). The combination of these factors seems to be the cause of the Reading Area's underpopulation.

Factors that do work according to the observations and questionnaire were the quiet, lack of a crowd, and large amounts of personal space. Users also felt safe enough to leave their belongings unattended on a number of occasions - it is possible that the small population had something to do with this. It is also possible that the Reading Room has certain restorative qualities, as users were sleeping on more than one occasion, the desks are just the right height for napping, and the historical/cultural elements of the Room might be relaxing for people (one staff member preferred to work at a computer because it was next to an old, historical clock, even though the clock did not work).

Another factor in the Reading Room is that upon entry into the library, the visual prospect on the central Reading Area makes it appear empty (due to the dividers on the tables), even when there are ten or more users sitting at the tables. It is unclear whether this serves as an attraction (because it looks like there are a lot of available seats) or a deterrent (because the library looks empty and deserted). However, since Uris seems to have a reputation for being underpopulated, it is more likely that this visual prospect acts as a deterrent, as users already would have known that it is possible to find personal space there.

General Factors

One final factor salient to the entire space is the issue of accessibility to food (snacks, coffee, tea, etc.). 50% of questionnaire respondents said that accessibility to food was important when working in a library. But patrons of Uris Library do not have immediate access to food. Though the Olin Cafe is just across the way, getting food from there involves going outside. Accessibility to food, therefore, might have major implications for the population or underpopulation of the library. Another factor might be locations where one is allowed to eat - Mann and Olin Libraries each have locations where eating is permitted, and though

eating is not permitted in Catherwood Library, eating is permitted in the rest of Ives Hall. However, Uris Library does not have any clear places where eating is permitted. These factors appear to make Uris Library a less successful space.

Background Research and Theory

Based on research and the questionnaire, it seems that stimulation (which Evans & McCoy (1998) describe as “the amount of information in a setting...that impinges on the human user”) in the Dean Reading Room is not excessive. On the contrary, there might actually not be enough stimulation - while it seems good that noise levels are low, lighting levels are also low, and there were a few sleeping users. It is important that a careful balance be maintained to prevent under- or over-stimulation.

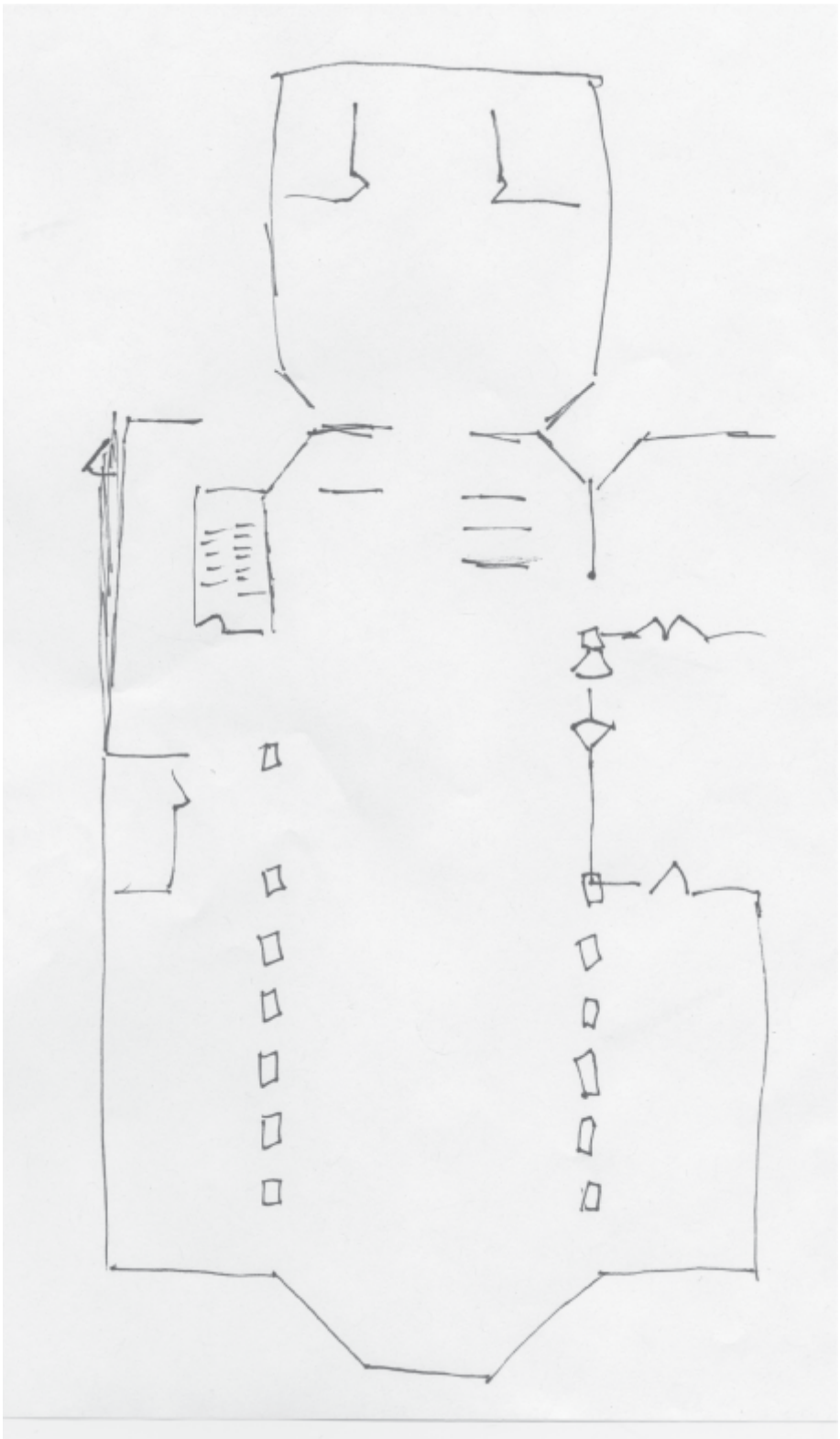
With regard to control and privacy, which Evans & McCoy (1998) define as “mastery or the ability to either alter the physical environment or regulate exposure to one’s surrounding” the space does seem to be fairly successful. Not only are there a number of different kinds of areas into which one could select themselves, but some of the areas have very clearly defined personal space boundaries. And if all of that fails, exits are easily accessible. The ability to open or close windows or shades would be nice, and would certainly add a strong element of control, but that might not be necessary are easily implementable. However, especially given that inadequate lighting was a frequent complaint in the space, individual lamps would both provide lighting, as well as increase the sense of control.

Executive Summary

We conducted a post-occupancy evaluation for the Dean Reading Room of Uris Library. The Room and the Library have been important parts of Cornell's history. However, of late, they has become less frequently used than other libraries, and this Evaluation was undertaken in an attempt to identify some of the factors. We began with a preliminary site analysis, in which we broke the site down by function and user group, and then we compared the library to other similar libraries. We then performed initial data collection which consisted of informal interviews with members of different user groups as well as an unstructured observation of the space. We continued with a review of some pertinent literature on the topic and identified major environmental dimensions of concern to the Room. Based on our preliminary study and literature review, we performed a more structured observation of the space under the lens of the new knowledge. Building off of the library comparison in the first section, we also composed a questionnaire and distributed it to users in four different libraries on the Cornell Campus: Uris, Olin, Catherwood and Mann. Based on the information we gathered through these different techniques, we identified key environmental qualities that may be contributing to the decreased use of the Dean Room. These environmental qualities can be used to inform the alteration of the Dean Room to make it suit users better and increase its use.

Appendices

Floor plan



Questionnaire

Library environment questionnaire

We're studying how the library is functioning. This process is called post-occupancy evaluation, and we are doing this as a DEA 2500 class project.

* Required

Room

Please answer the following questions about the room that you are in.

When you are working in a library, how important or unimportant is it that you have access to coffee, tea or snacks? *

	1	2	3	4	5	
Important	◯	◯	◯	◯	◯	Unimportant

How convenient or inconvenient is it to get coffee, tea or snacks when you are working here? *

	1	2	3	4	5	
Convenient	◯	◯	◯	◯	◯	Inconvenient

When you are working in this room and need to take a break, which of the following are you most likely to do *

- ◯ Leave this library
- ◯ Go to a different room in this library
- ◯ Go to a different part of this room
- ◯ Stay at the station you are working at

How's the sound in the room that you are in? *

	1	2	3	4	5	
Too quiet	◯	◯	◯	◯	◯	Too noisy

How's the light in the room that you are in? *

1	2	3	4	5

Too dim ◯ ◯ ◯ ◯ ◯ Too bright

How strongly do you agree or disagree with the following statements? *

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
The room distracts me from my work.	◯	◯	◯	◯	◯
I feel comfortable leaving my belongings unattended.	◯	◯	◯	◯	◯
The room is too crowded.	◯	◯	◯	◯	◯
The printers are the main source of noise.	◯	◯	◯	◯	◯

Library

Which library are you in right now? *

- ◯ Catherwood
- ◯ Olin
- ◯ Mann
- ◯ Uris

Of these four, which library is your favorite to work in? *

- ◯ Catherwood
- ◯ Olin
- ◯ Mann
- ◯ Uris

What is one reason why this library is your favorite of the four? *

You

What year of college are you in? *

- ◯ Freshman
- ◯ Sophomore
- ◯ Junior
- ◯ Senior
- ◯ Graduate student
- ◯ I'm not a student
- ◯ None of the above

If you are a Cornell undergraduate student, which school(s) are you in? *

- ☐ College of Agriculture and Life Sciences
- ☐ College of Architecture, Art, and Planning
- ☐ College of Arts and Sciences
- ☐ College of Engineering
- ☐ School of Hotel Administration
- ☐ College of Human Ecology
- ☐ School of Industrial and Labor Relations
- ☐ I'm not a Cornell undergraduate student.

What computer are you filling out this questionnaire on? *

- ◯ Your laptop computer
- ◯ Library laptop computer

- ◯ Desktop computer
- ◯ Tal's laptop computer

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Questionnaire Results

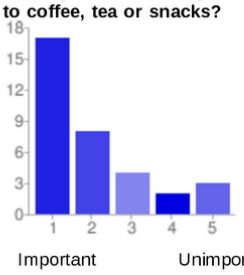
34 responses

Summary See complete responses

Room

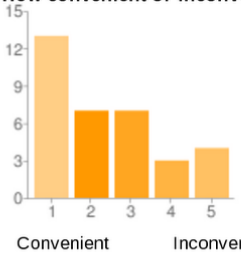
Please answer the following questions about the room that you are in.

When you are working in a library, how important or unimportant is it that you have access to coffee, tea or snacks?



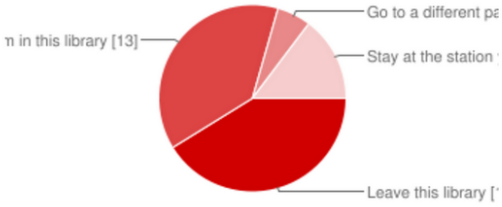
1 -	Important	**17**	50%
2		**8**	24%
3		**4**	12%
4		**2**	6%
5 -	Unimportant	**3**	9%

How convenient or inconvenient is it to get coffee, tea or snacks when you are working here?



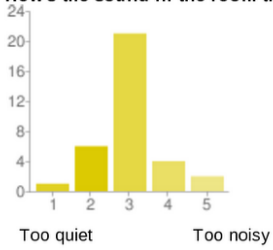
1 -	Convenient	**13**	38%
2		**7**	21%
3		**7**	21%
4		**3**	9%
5 -	Inconvenient	**4**	12%

When you are working in this room and need to take a break, which of the following are you most likely do



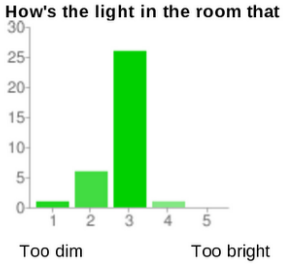
Leave this library	**14**	4
Go to a different room in this library	**13**	3
Go to a different part of this room	**2**	
Stay at the station you are working at	**5**	1

How's the sound in the room that you are in?



1 -	Too quiet	**1**	3%
2		**6**	18%
3		**21**	62%
4		**4**	12%
5 -	Too noisy	**2**	6%

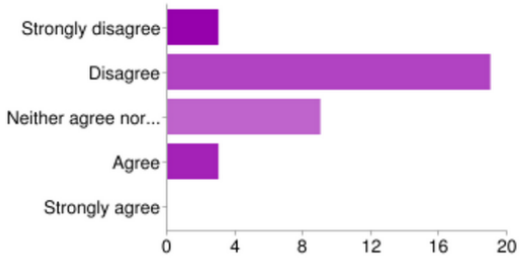
How's the light in the room that you are in?



1 -	Too dim	**1**	3%
2		**6**	18%
3		**26**	76%
4		**1**	3%
5 -	Too bright	**0**	0%

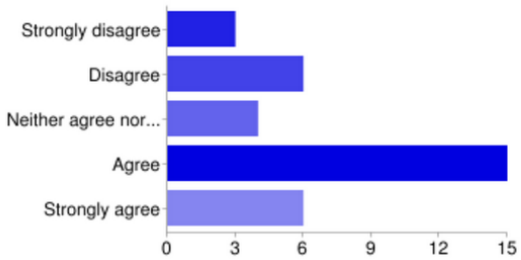
How strongly do you agree or disagree with the following statements? - The room distracts me

from my work.



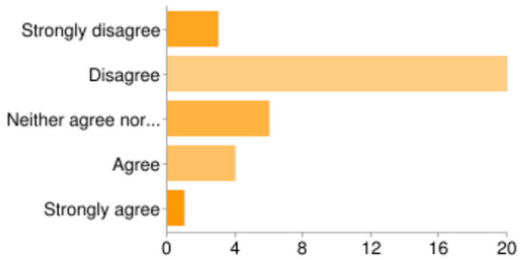
Strongly disagree	**3**	9%
Disagree	**19**	56%
Neither agree nor disagree	**9**	26%
Agree	**3**	9%
Strongly agree	**0**	0%

How strongly do you agree or disagree with the following statements? - I feel comfortable leaving my belongings unattended.



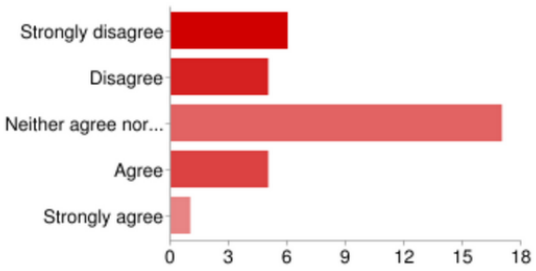
Strongly disagree	**3**	9%
Disagree	**6**	18%
Neither agree nor disagree	**4**	12%
Agree	**15**	44%
Strongly agree	**6**	18%

How strongly do you agree or disagree with the following statements? - The room is too crowded.



Strongly disagree	**3**	9%
Disagree	**20**	59%
Neither agree nor disagree	**6**	18%
Agree	**4**	12%
Strongly agree	**1**	3%

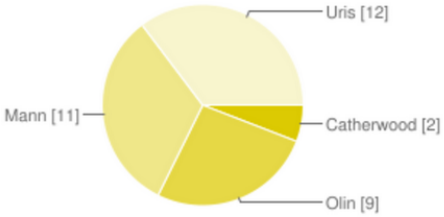
How strongly do you agree or disagree with the following statements? - The printers are the main source of noise.



Strongly disagree	**6**	18%
Disagree	**5**	15%
Neither agree nor disagree	**17**	50%
Agree	**5**	15%
Strongly agree	**1**	3%

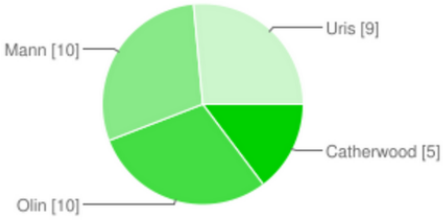
Library

Which library are you in right now?



Catherwood	**2**	6%
Olin	**9**	26%
Mann	**11**	32%
Uris	**12**	35%

Of these four, which library is your favorite to work in?



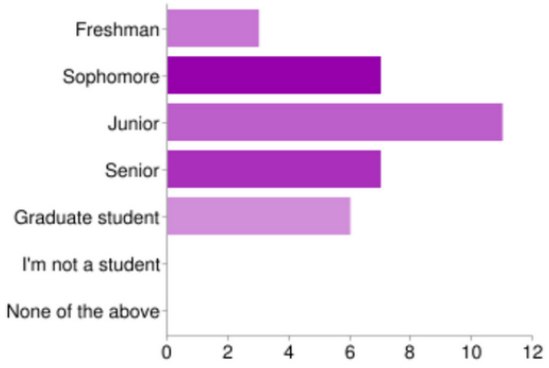
Catherwood	**5**	15%
Olin	**10**	29%
Mann	**10**	29%
Uris	**9**	26%

What is one reason why this library is your favorite of the four?

It's comfortable most quite Better chairs at the computers. They are padded where as the ones in Olin are not it has lockers and is centrally located/ closer to my apartment in collegetown It's really quiet study space, sound control, light Usually really quiet, lots of space. Downside is lighting (not enough of it) it is much quite in Uris library It is closest from my dorm Olin is way way way tooooooooooooooooo crowded. I am an ILR major so I am familiar with surroundings/people. Computer opportunities. Especially for computers which have two monitors. Convenient location to West campus, easy ac ...

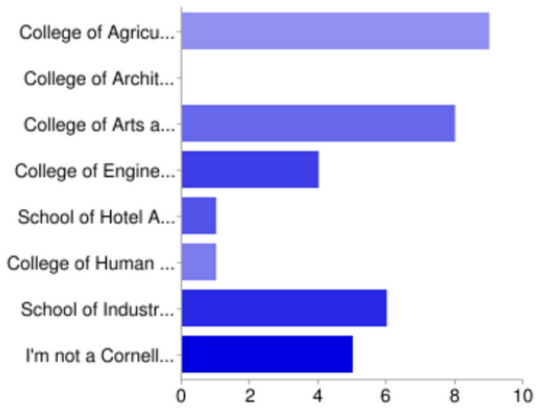
You

What year of college are you in?



Freshman	**3**	9%
Sophomore	**7**	21%
Junior	**11**	32%
Senior	**7**	21%
Graduate student	**6**	18%
I'm not a student	**0**	0%
None of the above	**0**	0%

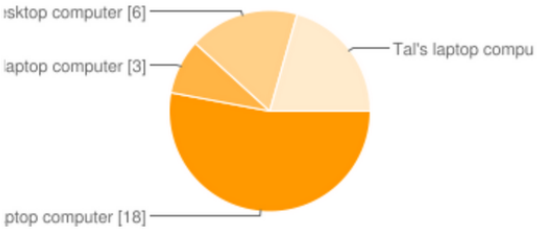
If you are a Cornell undergraduate student, which school(s) are you in?



College of Agriculture and Life Sciences	**9**
College of Architecture, Art, and Planning	**0**
College of Arts and Sciences	**8**
College of Engineering	**4**
School of Hotel Administration	**1**
College of Human Ecology	**1**
School of Industrial and Labor Relations	**6**
I'm not a Cornell undergraduate student.	**5**

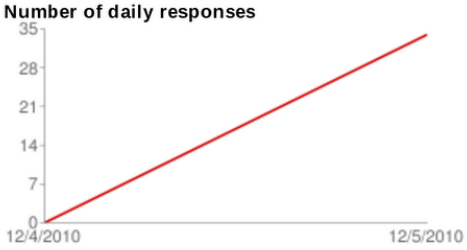
People may select more than one checkbox, so percentages may add up to more than 100%.

What computer are you filling out this questionnaire on?



Your laptop computer	**18**	53%
Library laptop computer	**3**	9%
Desktop computer	**6**	18%
Tal's laptop computer	**7**	21%

Number of daily responses



Observational instruments and data

Standing computer observations

`arrival time:` Time at which the patron of interest started using a standing workstation
`departure time:` Time at which the patron of interest left that standing workstation

	arrival time	departure time
1	2010-10-13 15:59	2010-10-13 16:02
2	2010-10-13 16:04	2010-10-13 16:07
3	2010-10-13 16:12	2010-10-13 16:27
4	2010-10-13 16:25	2010-10-13 16:28
5	2010-10-13 16:25	2010-10-13 16:31
6	2010-10-13 16:25	2010-10-13 16:40
7	2010-10-13 16:25	2010-10-13 16:31
8	2010-10-13 16:25	2010-10-13 16:35
9	2010-10-13 16:33	2010-10-13 16:35
10	2010-10-13 16:38	2010-10-13 16:39

Circulation desk observations

`time:` Time at which the patron of interest approached the circulation desk
`left:` Length of the line at the left station
`mid:` Length of the line at the middle station
`deskchoice:` Station that the patron approached

	time	left	mid	deskchoice
1	2010-10-13 15:03	0	0	mid
2	2010-10-13 15:03	0	0	mid
3	2010-10-13 15:03	0	0	mid
4	2010-10-13 15:03	0	1	left
5	2010-10-13 16:04	unstaffed	0	mid
6	2010-10-13 16:04	unstaffed	0	mid
7	2010-10-13 16:04	unstaffed	0	mid
8	2010-10-13 16:04	unstaffed	0	mid
9	2010-10-13 16:04	unstaffed	0	mid
10	2010-10-13 16:04	unstaffed	0	mid
11	2010-10-13 16:04	unstaffed	0	mid
12	2010-10-13 16:04	unstaffed	0	mid
13	2010-10-13 16:04	0	0	mid
14	2010-10-13 16:04	0	0	mid
15	2010-10-13 16:04	0	1	left
16	2010-10-13 16:04	0	0	mid
17	2010-10-13 16:04	0	0	mid
18	2010-10-13 16:04	0	1	left
19	2010-10-13 16:04	1	1	mid

20	2010-10-13 16:04	1	1	bookdrop
21	2010-10-13 16:04	1	2	left
22	2010-10-13 16:04	2	2	mid
23	2010-10-13 16:04	0	0	mid
24	2010-10-13 16:04	0	0	left
25	2010-10-13 16:04	0	0	mid
26	2010-10-13 16:04	1	0	mid
27	2010-10-13 16:04	1	1	mid
28	2010-10-13 16:04	0	0	mid
29	2010-10-13 16:04	0	1	left
30	2010-10-13 16:04	1	1	mid
31	2010-10-13 16:04	0	0	mid