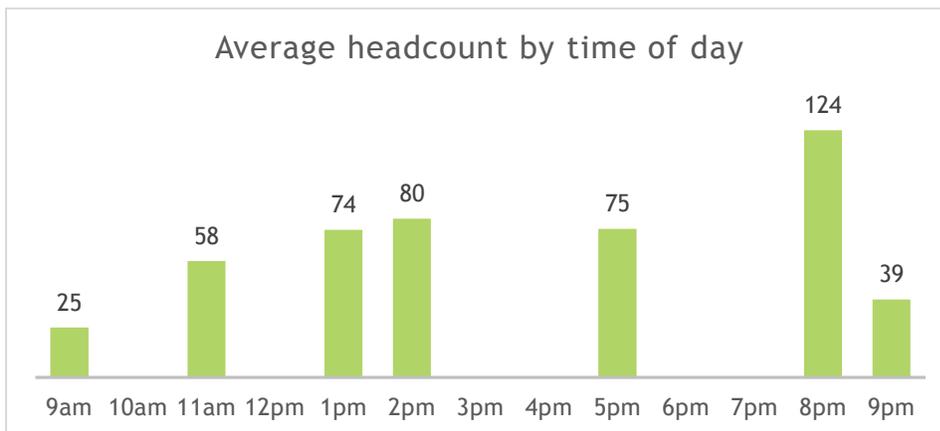
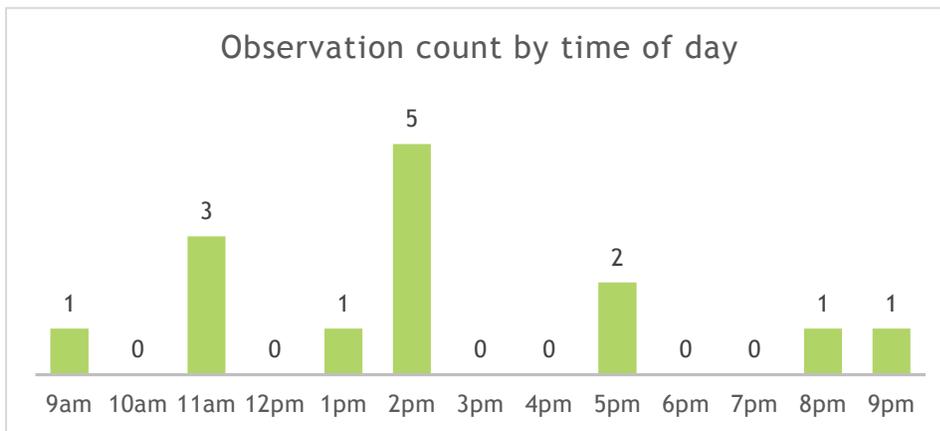


Perkins Library space usage

Background¹

From November 19th-25th 2014, AUX staff conducted observational sampling of space usage on the second and fourth floors of Perkins library using Suma.² The goal of this observation was to understand which types of furniture are most heavily used, and what types of activities patrons perform while using different types of furniture. We also hoped to get a general sense of how many people were using the space. Between two and five observations were conducted each day, Monday through Friday. The majority of observations (43%) occurred between 1pm-2:59pm. The highest single occupancy rate was observed between 8pm-8:59pm on Wednesday (124 people).



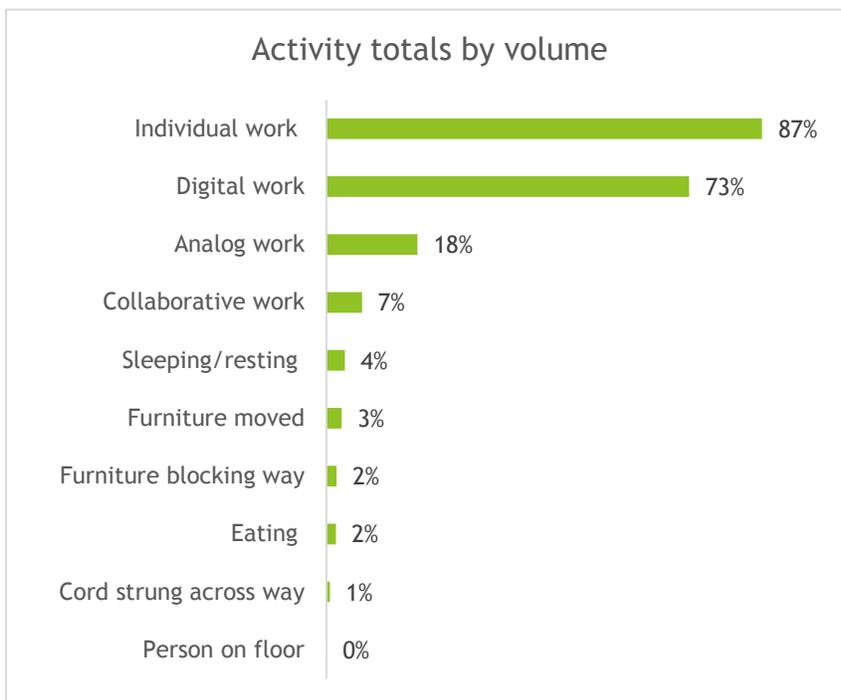
¹ For more information, please contact emily.daly@duke.edu

² Suma is a tablet-based open-source toolkit for data collection and analysis
<http://www.lib.ncsu.edu/reports/suma>

Notes on data

For some reporting, data is grouped into categories of “morning,” “afternoon,” and “evening.” Morning includes 9am-12:59pm (4 observations), afternoon includes 1pm-4:59pm (6 observations), and evening includes 5pm-10:59pm (4 observations). Observed people were tagged with multiple activities; for example, a single individual could be tagged simultaneously with “eating,” digital work,” and “individual work.”

Findings



Activities

The figure to the left shows the percentage of total observed users that were tagged with a given activity. Every observed person should have been tagged with either “individual work” or “collaborative work,” as well as with either “digital work” or “analog work.” However, since the categories do not add up to 100%, a number of observed people were not tagged.³

Based on the data available, individual work is 11 times more common than collaborative work, and digital work⁴ is four times more likely

than analog work.

Data was also analyzed by time of day. Some points of interest include:

- **Sleeping/resting** is twice as likely to occur in the morning as the afternoon, and four times as likely in the morning as the evening.⁵
- **Collaborative work** is only half as common in the afternoon as the morning and three times more common in the evening than in the afternoon.⁶

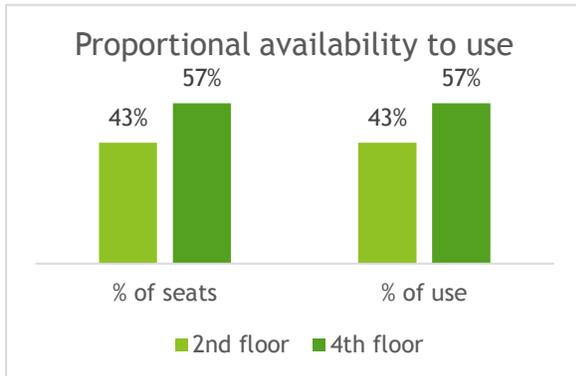
³ This pattern is exacerbated at certain times of day; for example, while most observed users were tagged in the morning observations, during the afternoon observations only about 45% of observed people were tagged with either of these.

⁴ “Digital work” refers to anyone with a computer or who is actively using a phone or tablet.

⁵ (Morning 4%, afternoon 2%, evening 1%)

- **Eating** is five times more likely to occur in the morning than any other time of day.

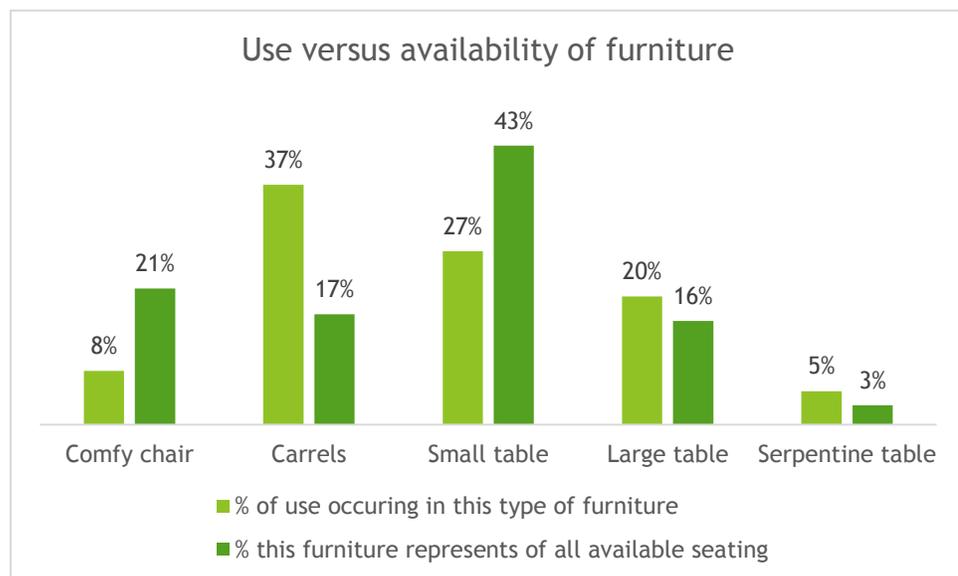
Furniture



As seen in the chart to the left, seating availability is strangely proportional to seating use: 43% of seats were located on the 2nd floor and 43% of use was also observed on the 2nd floor; similarly, 57% of seats were on the 4th floor, as was 57% of use. All seats were not occupied during each observation, so proportional use cannot be considered to simply be a side effect of maximum occupancy. Not all furniture types received proportional use in correlation to their availability, as shown below.

Carrels, large tables, and serpentine tables receive a proportionally higher volume of use than there is available seating. In contrast, comfy chairs and small tables receive a proportionally smaller volume of use than there is seating available.

Small tables: seats available at small tables represent 43% of all seating and received 27% of observed use. Small tables are used proportionally more on the 2nd floor than on the 4th floor: 27% of small table seats are on the 2nd floor, as is 34% of small table seat use. The majority of 2nd floor small tables and small table use is on the Main open floor and in the Group study room.



The majority of 4th floor small tables and small table use is in the Carrel hallways, Western perimeter, and Group study rooms.

Large tables: seats available at large tables represent 16% of all seating and receive 20% of observed furniture use. Large tables are used far more proportionally on the 4th floor than on the second floor: while each floor contains 50% of the large table seats, the 4th floor receives ¾ of all large table seat use. The most popular large table on the 2nd floor is in the Lobby, with 8% of all use. The most popular large tables on the 4th floor are North of the study rooms (lobby side), with 39% of all large table use, followed by those located South of the study rooms with 21% of all large table use.

Comfy seating: comfy seating represent 21% of all seating in the observed area but receives only 8% of use. Proportionally, the 4th floor comfy chairs receive slightly more use per chair available than the 2nd floor comfy chairs. The 4th floor has 52% of seats and 59% of use. On the 2nd floor comfy chairs are almost all in the Lobby and on the Main open floor, but most of the use occurs in the Lobby chairs (where we observed 25% of total use for only 13% of total comfy chairs). Only 15% of total comfy chair

⁶ (Morning 7%, afternoon 3%, evening 9%)

use occurs on the Main open floor, which contains 29% of total comfy chairs. On the 4th floor both comfy chairs and usage are more evenly distributed.

Serpentine tables: seats available at serpentine tables represent 3% of all seating in the observed area and receive 5% of all observed furniture use. There are no serpentine tables in the area observed on the 4th floor. All nine seats are located in the Main open floor of Perkins 2.

Open carrels: open carrels represent 17% of all seating in the observed area but are responsible for 37% of all use. Open carrels on the 4th floor receive slightly more use proportionally than those on the 2nd floor; the 4th floor contains 40% of open carrels and receives 47% of use. Open carrels on the 2nd floor are on the Main open floor, while open carrels on the 4th floor are in the Tower reading room and Western perimeter. The Western perimeter open carrels receive a higher percentage of proportional use than other carrels; they represent 36% of all open carrels but receive 43% of use.

Furniture use by time of day

- Use of comfy chairs is about 30% more frequent in the mornings than the afternoon or evenings
- Use of open carrels and serpentine tables is consistent throughout the day
- Small tables are used 25% less in the evening than the morning and afternoons
- Large tables are used almost twice as much in the evening as in the morning or afternoon

Combined activities and furniture

- **Small tables:** there is proportionally more collaborative work at small tables than other furniture types; nearly six times as many people at small tables work individually than they do collaboratively, compared to the overall average of 11 times more individual than collaborative work. Digital work is also 2.5 times more likely to occur at small tables than analog work, which is proportionally less than the average (generally there is four times more digital than analog work).
- **Large tables:** individual work occurs nine times more often than collaborative work, which is not out of the ordinary. Digital work is 5 times more likely here, and virtually no sleeping occurs at large tables.
- **Comfy seating:** people are nine times more likely to work individually in comfy chairs than collaboratively, which is in line with general trends. Three times more digital work happens here than analog work, which is also fairly in line with the general trend. One point of interest is that 10% of people in comfy chairs were observed to be sleeping/relaxing; this rate is five times higher than occurs in any other furniture type.⁷
- **Open carrels:** open carrels align with the overall average for analog versus digital work. No collaborative work happens at carrels.

When absolute values are considered instead of the relative percentages, we find the following points about activities and furniture:

- Fifty-two percent of all eating happens at small tables, and a third of eating happens in carrels.
- Fifty-three percent of collaborative work happens at small tables, 28% at large tables, and 11% at comfy chairs. When combined, 81% of collaborative work happens at tables.
- Thirty-seven percent of analog work happens at carrels, 30% happens at small tables, and 17% happens at large tables.

⁷ This does not mean that more sleeping happens in comfy seating than at any other type of furniture, it means that a higher percent of use of this furniture type is dedicated to sleeping. No other furniture type had more than 2% of its total use dedicated to sleeping/relaxing.

Locations

Most locations contain a percent of the total seats that is fairly proportional to the percent of total use observed in the location. The four exceptions were:

- Perkins 2, Main open floor, North section: 15% of use, 9% of seats
- Perkins 2, Graduate reading room: 2% of use, 5% of seats
- Perkins 4, Grand Fish lobby: 2% of use, 8% of seats
- Perkins 4, West perimeter: 20% use, 11% of seats

