

Appendix
The Current Usage of Regenstein
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A. Overall Regenstein Use - Recent Trends

Library entries give some indication of general library use. Entry may not mean use of the library, to be sure (smokers have to exit and return to smoke). Also, problems with the turnstiles have meant large amounts of missing data. But the entry data we do have tell us something about who is in the library, which in turn can tell us something about what kind of a place it is. As it turns out, there are major shifts in library entry even over the last four years, and these have distinct implications for the library's long-run development.

Entries are of course a function of two things: the numbers of persons in the categories of users and rates of use in each category. The recent rapid expansion of the College, combined with the concurrent leveling off of doctoral education, thus plays an important part in the raw figures, which are uncorrected for student numbers and differing rates of use in different categories. The raw figures are nonetheless important, since they tell us the mix of people who are actually in the library.

Table 1. Raw Entries to Regenstein, 2000/2001 compared with 2003/2004

	2000-01	2003/04	Change	Change	% all use 0/1	% all use 3/4
Undergrad	258757	362485	103728	0.401	0.314	0.390
MA Students	53619	100741	47122	0.879	0.065	0.108
PhD Students	310685	256341	-54344	-.175	0.377	0.276
Postdocs	581	10	-571	-.983	0.001	0.000
Stud-at-large	4807	4804	-3	-.001	0.006	0.005
Special Stud	2420	1508	-912	-.377	0.003	0.002
Non-Degree S	5221	11858	6637	1.271	0.006	0.013
Academics	22202	18286	-3916	-.176	0.027	0.020
Lecturers	10751	7764	-2987	-.278	0.013	0.008
Faculty	20491	16516	-3975	-.194	0.025	0.018
Staff	72955	57009	-15946	-.219	0.089	0.061
Lib Card Holders	61474	91235	29761	0.484	0.075	0.098

Example - in 2000/1 there were 258757 UG entries, in 2003/4 362485 UG entries. The difference in these two is 103728, a 40.1% increase. UG entries were .314 of all entries in 00/01 and .390 of all entries in 03/04.

The large influx of undergraduates has helped create a 40% increase in undergraduate use in only four years. (The near doubling of MA student use in the same period turns out to be partly a behavior change and partly a reclassification of some types of students.) Half the entries to Regenstein are now provided by these two groups, up from about 38% only four years before. PhD students are no longer the largest single contingent of entrants to the library, losing a position they no doubt have occupied since the building opened in 1969. These are striking trends in a short time, no doubt principally due to the opening of the Palevsky dormitory in 2001/2.

These raw figures do not tell us whether rates of use are changing at the individual level, except in the case of faculty, whose numbers have not changed. Of course undergraduate use is up, we might think; we have hundreds

more undergraduates. To report changes in average behavior, we give figures for the major student/faculty user categories corrected by the numbers of such users. The first two columns have the numbers of entries in the two years studied, the next two the numbers of individuals in that class of users in the university, and the fifth the difference between the first two. The last two columns have the number of entries per individual.

Table 2. Rates of entry among important classes of users

	2000-01	2003/04	N 0/1	N 3/4	Diff	E / S	E / S
Undergrad	258757	362485	3904	4226	103728	66.3	85.8
MA Students	53619	100741	3350	3395	47122	16.0	29.7
MA HD, SSD	27747	43733	368	384	15986	75.4	113.9
PhD Students	310685	256341	3236	3373	-54344	96.0	76.0
PhD HD, SSD, Div	250594	234279	2268	2228	-16315	110.5	105.2
Faculty	20491	16516	1085	1099	-3975	18.9	15.0
F - Col,HD,SSD,Div	19324	14591	354	360	-4733	54.6	40.5

The average undergraduate is going into Regenstein almost one-third more often, the average masters student nearly twice as often, although this effect is in part a result of reclassifications. PhD students in general are going into the library almost 25% less often, although this number is almost holding constant among the heaviest entrants - the PhD students of HD, SSD and Div School. Faculty in general are a little less likely to go there but the core faculty - Col, HD, SSD, and Div - have dropped over 20% in their likelihood to enter JRL.

This table becomes more easily interpretable if we look at the correlative circulation figures. Unfortunately these figures do not distinguish levels of graduate students, so we have simply added together MA and PhD students. Note that renewals are included in these figures.

Table 3. Rates of circulation among major classes of users.

	2000-01	2003/04	N 0/1	N 3/4	Diff	E / S	E / S
Undergrad	132249	135499	3904	4226	3250	33.9	32.1
Grad Students	388827	404000	3350	3395	15173	116.1	119.0
Faculty	37425	60548	1085	1099	23123	34.5	55.1

Thus, while undergraduates are going to the library much more often, they are taking out somewhat fewer books. Grad students are holding their own in circulation, but faculty have vastly increased their circulation level, even while entering the building less frequently. These circulation data underline the general trend. The undergraduates and nonPhD graduates are taking over JRL as a study space, while the faculty are becoming absentee researcher-landlords. In effect, two largely unrelated activities are taking place in the same physical space.

B. Heavy Users and Non-users of Regenstein

The circulation figures are the data most useful for investigating actual

use of the library qua research facility, as opposed to building entry, which can be simply for studying, email activity, and so on. It seems relatively likely that at any given time circulation use of the library is proportional to other kinds of research use - work in the stacks, reference, and so on. (Note also that unlike entry, circulation is not subject to missing days of data, non-substantive counting, and so on.) Circulation figures do however have the limitation that they are system-wide, not limited to JRL.

When we look at 2003-4 circulation use system-wide, we find there are a total of 435,813 circulation episodes to persons. (This omits all circulation to the bindery, to temporary shelving storage, interlibrary loan, trace, Special Collections, and so on.) That is, the 435,813 episodes are episodes of individuals taking particular books out ("taking them out" in the bureaucratic sense is larger than the physical one - they could be in JRL faculty studies.) The episode figures do not include renewals. (Library circulation-by-user-category data do involve renewals, which of course biases the figures towards graduate students, who do not have the indefinite privileges of faculty.) They do however include reserves. (This problem is becoming less important as e-reserves [which do not need to be charged] are tending to replace physical reserves.)

Circulation usage is very highly concentrated. The following table presents the usage deciles in the data. Reading across the first line, we see that 10% of the circulation (43,581 charges) is provided by the 105 heaviest users! They take out at least 275 books apiece in the year. They represent 1% of the users and 10% of the use. Note that the figures in all columns except column 3 are cumulative. So the second line should be read that 20% of the charges (87163) are attributable to 310 users (amongst whom are the 105 of the first row), who average 176 charges per user, and are 2% of the total of 13,681 users.

Note that "users" means people who took out at least one book. We shall discuss non-users - people with privileges who took nothing out - below. But this limited definition of "user" means that the actual concentration of use is actually even more severe than it appears here.

Table 3. Deciles of system-wide circulation users, ranked by individual use.

total charges	cum. # of users	charges per user	Cum. % of users	cum. % of use
43581	105	275	1	10
87163	310	176	2	20
130744	600	130	4	30
174325	987	100	7	40
217907	1488	76	11	50
261488	2150	57	16	60
305069	3035	42	22	70
348650	4289	29	31	80
392232	6324	16	46	90
435813	13681	1	100	100

This table tells a striking story. The library has 13,681 users, but 7% of them, about a thousand people, provide 40% of the use by taking out at least a hundred books a year. At the other end of the scale, slightly more than half the library's users took out only one to fifteen books last year and therefore provided a mere ten percent of the library's usage. Indeed, the figures are almost exact mirrors: eleven percent of the people provide half the circulation and at the other end ten percent of the circulation comes from half the people.

The group of central interest in future planning is the core group of library users, the "heavy user" group of slightly under one thousand people who each take out at least 100 books a year. A few of these are in various odd categories (Crerar corporate, CTS faculty, student at large, etc). But 95% of these people fall into the following core categories. We break them down by level of use. Note that all these figures are cumulative as we go to the right. That is, 14 faculty take out at least 300 books a year, 30 faculty take at least 200 books a year (the 14 over 300 and another 16 who took out between 200 and 300) and so on. The figures in the table are all raw numbers of individuals, not percents.

Table 4. Heavy Users by status and numbers of books taken out.

	Books Taken out in the Year 2003/4			
	300+	200+	150+	100+
Instructional Personnel				
Faculty	14	30	43	78
Academic A	1	5	8	16
Academic L	1	5	12	26
Students				
Grad PhD	41	123	141	489
Grad ~PhD	4	13	33	104
Undergrad	8	16	37	133
Other				
Alum PhD	1	4	5	10
Alum MA	1	5	11	21
Alum UG	1	3	9	24
Staff	5	7	14	33
Total (inc. not shown)	85	231	442	987

The core of the heavy user group - about 65% of that group at the upper range of use and around 45% of it overall - comprises regular faculty and PhD-level graduate students. Put another way, the core group of heavy user faculty and graduate students numbers about 50 to 70 faculty and about four or five students for each of those. This group of heavy-user faculty and graduate students is responsible for about 20% of the system's total circulation. About the faculty, we can be quite specific. There were in this year 336 faculty in HD, SSD, and the Divinity School. Of these, about 25% (78) are heavy (100+) library users and about 10% (30) are very heavy (200+) library users.

The library is thus a laboratory-like facility for a core group of heavy users. For a substantial group - even perhaps a majority - of users, it is a rather incidental facility. This group would not suffer much if expensive services were cut or indeed if the collection were much smaller. As the library becomes for these regular users less and less of a physical reality and more and more a place from which to access on-line material, its differentiation from other universities' libraries rests more and more on the physical and circulation use associated with its core users. This core is the roughly five hundred person group of faculty and students for whom precisely those services and collections are the focus of their work.

By contrast, at the other end of the scale, some proportion of the university community makes no use of the libraries whatever. In the 2003/4 circulation data, these total non-users of the library can be seen to be a relatively small group. The following table shows total numbers of users in the major categories, followed by estimates of the size of the group where relevant. These data indicate that in the major categories non-users make up 20% or less of the total of faculty, undergraduates, and PhD graduates. They are a much larger proportion among MA students. Note that these figures do contain reserve checkouts, which are about 15% of all checkouts. This probably inflates the undergraduate user figure considerably. It should be noted that there are about 33,000 total cardholders.

Table 5. Users and Non-users

Instructional Personnel	Users	Total Pool
Faculty	837	1099 (Senate faculty)
Academic A	382	
Academic L	302	
Students		
Grad PhD	2773	3373
Grad ~PhD	2094	3395
Undergrad	3698	4226
Other		
Alum PhD	200	
Alum MA	197	
Alum UG	242	
Staff	1247	
Lab School Student	91	
Med House Staff	127	

C. Faculty Usage

There are no exact statistics on the long-run trend in faculty usage of the library. Since the turnstiles were installed we have data on entries, but this data covers only the last few years. We are thus reduced to talking about recent trends, which may or may not reflect long-run developments.

Overall Faculty patterns

Among the four Divisions, library use is basically a Humanities and Social Sciences affair. A useful cutoff is 20 entries to a turnstile library (JRL or JCL). As we noted earlier 9% of PSD faculty entered a library 20 times or more in 2003-4, and 12% of BSD faculty. By contrast, the figures for Social Sciences and Humanities were 30% and 50% respectively.

Although our report is mainly concerned with Regenstein, it is worth noting that as these figures imply, faculty are almost invisible in Crerar. There were only 11 days in 2003-4 on which more than 15 faculty entered Crerar (and probably seven of these were the days on which meetings of the Library Board brought five to ten faculty to the Crerar Conference room).

Daily faculty entries to Crerar do not show any substantial weekly pattern or even quarterly pattern. By contrast, faculty entries to Regenstein

are very strongly marked by week and quarter. Weekdays in term-time typically see 60 or more faculty entries to JRL. The Christmas break is a distinct low point (both AHA and MLA meet in this break) while the summer still sees 40 or more faculty entries on nearly every weekday. (JRL does not fall to "summer level" of use until well into June, and ramps up for the fall early in September.) Even on weekend days, JRL sees more than the 15 daily faculty entries that are the upper limit for Crerar on its heaviest faculty days. Crerar basically doesn't exist for faculty other than the handful working on the history of science, medicine, and technology.

Turning to the figures given earlier on entries to Regenstein, we know that since faculty numbers did not change substantially in the period 2001/2 to 2003/4, the faculty numbers reported above are in effect figures on rates. Thus, we should note the relatively sharp fall in faculty presence in the library, which is off nearly 20%. As we have seen, this is the exact opposite of the circulation figures; faculty circulation from JRL climbed by over 70% (24505 to 41937) in the same period. It seems likely that faculty are taking books out that they used to consult in the stacks.

To investigate this a little more closely, we can look at the data by division. By coding the University Senate data, we can produce the following table, which gives entries to JRL by unit for the various Divisions and Schools in 2001/2 and 2003/4. Faculty are classified by their primary appointments, normally the first in their Senate listing. The main figure is the number of visits per year and the figure in parentheses is the number of faculty attributed primarily to that unit.

Table 6. Annual Entries to Regenstein per faculty member, by Division

	2001/2	2003/4
College	89.1 (18)	77.0 (24)
Humanities	56.8 (147)	48.1 (144)
SSD	35.7 (163)	28.9 (167)
Div School	29.2 (26)	39.4 (25)
Harris Schl.	24.4 (13)	14.9 (16)
OI	7.8 (13)	23.3 (11)
SSA	9.3 (27)	5.3 (24)
PSD	4.7 (143)	3.3 (151)
GSB	4.3 (98)	2.3 (109)
LS	2.5 (32)	1.4 (31)
BSD	1.8 (403)	1.2 (397)

Again we see that at the faculty level, Regenstein is basically a library for the College, the Divinity School, and the Humanities and Social Science Divisions. (Indeed of 16,516 faculty entries to Regenstein, 88% come from the College, Div School, HD, and SSD.) Units with their own libraries don't use Regenstein much (BSD, LS, SSA). (The same is true at the graduate student level, as we shall see below.)

But with the exceptions of the Divinity School and the OI - small groups where small changes can shift the figures sharply - faculty entries are down in every unit. Most important, this is true in HD and SSD, which provide between them about 71% of JRL faculty entries. But it is also true of the College faculty, the Harris School Faculty, and even of small scale users like SSA, PSD, GSB, LS, and BSD. The faculty pattern of going less often to the library is largely uniform across divisions.

It is not clear how long this trend has endured, nor how it relates to the gradual repopulation of the building since 1995. But when we look for

reasons for the short-run trend, it seems likely that there are both pull and push factors. On the pull side, the ability to access internet-based library facilities and catalogues from their own offices makes faculty able to do major bibliographical work under convenient conditions, with their own books at hand, and with relatively small levels of general disruption. Office use is convenient, quiet, and, most often, uninterrupted by noise and disturbance. Of course, primary historical bibliography generally can't be done this way, but most other types of bibliography can be.

On the push side, conducting research in Regenstein has become difficult. The main floor reference collections are dispersed throughout a space mainly devoted to student internet use and study. The unity of stack collections and reference collections on the various floors was destroyed by the stack reorganization necessary in the 1990s. Terminals are often not available for quick bibliographic and research use. At its heaviest use periods (afternoons), the building is sometimes very noisy.

Before we draw conclusions about faculty behavior patterns, however, it is crucial to look at faculty behavior at the individual level. Both anecdotal data and formal report indicate that usage of the library by a given faculty member fluctuates considerably from quarter to quarter and from year to year; a leave year, a non-library project, a heavy teaching load can reshape usage sharply. In our search for a general indicator of faculty usage at the individual level, we therefore created a composite measure, which combined entry data for two years and circulation data for two years. We log transformed these numbers before adding them to reduce the impact of sudden spikes. Because we did not do any other transformation, the measure is slightly dominated by the circulation data, which is preferable because the circulation data are more exact and also embody a more specific indicator of research library use. The resulting individual-use indicator provides a more stable guide to behavior by individual faculty members than any one particular figure.

As the "heavy user" data leads one to suspect, this individual-use indicator shows wide differentiation in faculty use patterns. The following gives something of a picture of the top 200 faculty users by this measure. We report the actual numbers for the highest person on this indicator, followed by every 25th individual going down the list to the 200th. Note that the statistics were done slightly before the end of the 2005 year, so the 2005 statistics have only 10 months of data in them. So the second row, for example, tells us that the 25th highest faculty member on this indicator took out 323 books in 2003/4 and 224 in the first ten months of 2004/5. He entered the library 147 times in the 2003/4 and 64 times in the first ten months of 2004/5.

Table 7. Patterns of Charges and Entries Among Heavy Users

Person Number	Charges		Entries	
	03/04	04/05	03/04	04/05
1	323	224	566	404
25	277	99	147	64
50	38	32	178	245
75	49	55	71	75
100	92	38	36	33
125	53	42	38	25
150	52	17	60	12
175	27	53	18	12
200	22	26	25	12

These figures show clearly the expected sharp variation from year to year as faculty go on or return from time away, take on or shed teaching obligations, move from library-based project to non-library project, and so on. But they give one a sense of what the high end of faculty use looks like. If one figures a year as four ten-week quarters of 50 working days apiece, there is a group of around a hundred faculty who are in the library about one working day out of three. The top fifty users are in the library most working days.

Usage of the library is, moreover, typically concentrated in the year. The data bear this out, at least among those faculty who generated enough entries to sustain so detailed an investigation. 95 faculty entered the library 50 more or times in 2003-4. Of these 39 had their highest use quarter in the summer, 26 in the spring, 16 in winter, and 14 in fall. Fully 70 of these 95 had their two highest quarters adjacent. Interestingly, the exact "two-highest" patterns are quite spread around the year: 23 were summer/autumn, 23 winter/spring, and 16 spring/summer. Only 8 were autumn/winter, confirming the common notion that most faculty teach heavily in one of those two quarters. The split patterns (autumn/spring = 10 and winter/summer = 15) are actually more common than the autumn/winter sequence.

The median in this group is to have two thirds of entries in the two highest quarters, which could be read as a glass half full (as against a 50% random expectation) or a glass half empty (because it means that faculty are still entering often in "non-high" quarters). The median in the highest quarter is 37% of all entries, but the median in the lowest is 11%. So there is distinct, but by no means overwhelming, concentration. Heavy-user faculty tend to concentrate their work in a couple of quarters, but they are not completely absent at any period in the year.

Circulation:

We have earlier showed the existence of a core group of faculty heavy users - a group of from 30 to 70 faculty who take out from 100 to 200 or more books a year. However, it should also be noted that there is another kind of faculty heavy user, not necessarily identical with these high turnover users. This is the faculty member who doesn't check out a lot of new material in any given year, but has many books charged out at any given time, possibly built up over many years. We can think of this as "reference" circulation.

A not insubstantial amount of faculty circulation at any given time is of this reference type. Of the 46,945 items on indefinite loan as of the end of 2003, only 13% had been charged in 2003. Another 23% were charged in 2002. The median charge year was 2000, four years before the study date. A third of existing charges were 5 or more years old, a quarter were 7 or more years old.

Such a pattern is characteristic of duration systems where the probability of change (in this case, the return of a book from charge) declines with time. In any given year, the majority of indefinite charges will come back quickly. But the longer a book stays out, the less likely it is to come back in a given time interval. Thus the population of books charged out at any given time is surprisingly old, even though most charge activity is for books that go out for brief periods.

These long-duration charges are essentially reference works for faculty, works that have become part of their permanent collections for the duration of their employment. It is striking that something like a third of the faculty charges at any given time are of this kind. Note that this kind of borrowing is not possible on interlibrary loan and would require complete copying of the materials concerned. We should thus recognize those whose borrowing is of this

"reference" type as another kind of heavy user. Comparison of this "reference" borrowing list with the earlier "heavy user" list indicates that these are by no means the same groups of people. Reference users probably round out the faculty "core user" group to a full 100 to 130 people.

Authorized borrowers:

There is a strong impression that faculty have moved towards a model of going to the library less often themselves, but rather employing RAs with special library cards that route any charges to the employing faculty member's charge list. These are called authorized borrowers (ABs).

There is no complete historical data on use of ABs, either in terms of their numbers nor in terms of the number of charges that occurred through them. 139 faculty have ABs at present, but 311 faculty have books currently charged to them that were originally charged by ABs. It is thus evident that ABs are transient employees, who are often dropped when a project is completed. (There are undoubtedly some faculty who have had ABs in the past who do not have them now and who no longer have any charges attributable to ABs.) It is also important to note that only a tiny handful of faculty do not do the majority of their own charging; the vast majority of faculty with ABs take out more books themselves than their ABs do.

The disparity between present and past employment of ABs means that it is useful in this analysis to use the phrase "heavy user" to denote a user with a large number of total charges at a given moment (i.e., a heavy "reference" user) rather than, as usual in this report, a user with a large number of new charges in a given time. In this sense, the heaviest total faculty users are not wedded to ABs. Only 27 of the 123 faculty with more than 100 books out of the library right now have ABs currently. However, 65 of those 123 have current charges that are attributable to ABs, and hence must have had them in the past. Hence we can guess that while about 50% of serious faculty users have ABs sooner or later, only about 20% have ABs at any given moment.

If we look at the population of "heavy users of ABs" - defined by at least 25 books currently charged that are attributable to an AB, there are 73 such faculty, of whom 33 have less than 100 books checked out total. Thus AB use is spread across the various charging levels of faculty. The 73 heavy AB users are spread fairly widely across divisions and schools, but when we look at the rates of use, there are clear concentrations. We see this by seeing what fraction of the heavy users (over 100 charges total) in a division or school have now or have ever had ABs. Taking the three divisions that provide most of Regenstein's use, we have humanities (20% [have now] and 42% [ever had]), Social Sciences (16% and 67%), and divinity (75% and 88%). So usage seems standard in Divinity, fairly common in Social Sciences, and less common in Humanities. We can look at this the other way by seeing the number of heavy users (100 or more current charges) with no AB charges at all. Of these 58 faculty, 30 are HD, 12 SSD, 3 PSD, and the rest scattered. When one reads down this list from the top, 22 of the top 30 are HD faculty. It thus seems clear that AB use is somewhat unevenly distributed: lowest in HD, medium in SSD, and somewhat higher in Divinity and some of the other professional schools.

There is thus no strong evidence for an overall shift to ABs. Rather, ABs are characteristic only in certain parts of the university. They are fairly episodic elsewhere. Most faculty do not have ABs and most faculty have never had ABs. Most faculty with ABs take out more books than their ABs do. AB use is particularly low in the Humanities Division, intermittent in the Social Sciences Division, and more extensive elsewhere.

Faculty Studies:

There are a total of 231 faculty studies at present. Having a faculty study is fairly concentrated, as one might expect, in the heavy user community. 36 of the top 50 users (by the composite measure above) have faculty studies. 67 of the top 100 users have them. 101 of the top 200 users have them. They are also concentrated divisionally: 47% of them held by humanists and 31% of them by social scientists.

As these figures indicate, however, faculty studies are also held by faculty who use the library much less. Indeed, a substantial number of faculty studies are held by faculty who did not enter the library more than a handful of times in the years for which we have turnstile data. This underuse is corroborated by walk through inspections, which were conducted under Task Force aegis in the summer quarter week of 15-19 August and the fall quarter week of 31 October to 4 November. Treating "the lights are on" as a measure of use, the entire study wing was canvassed at 9 and 11 AM, and at 2, 4, and 8:30 PM. The highest single usage was 15 (of 231) at 2PM on 31 October. If we total all the uses across a given day (treating "lights-on" in one study at two different times as separate events) the highest total use was 43 events on Monday 31 October, and the mean for that week was 31 events a day. (The summer mean was 17 events per day.) Even if half the faculty with studies don't turn the lights on when they use their studies, it is plain that many - probably most - studies are in effect unused much of the time and that not a few studies are to all intents and purposes never used.

These figures should, however, be seen in the context of the "concentrated quarter" figures above. Most faculty have concentrated quarters and might be expected not to use their studies in "off" quarters. (At the same time, it is striking that while more faculty have their highest use quarter in summer than in fall, these figures indicate much heavier study usage in the fall.) So it may be that study use is more than it appears. Nonetheless, it seems plain that the faculty study wing is seriously underused.

Summary:

Faculty use of Regenstein is changing in ways that are not easy to read. Overall, faculty entry to the building is down somewhat, but circulation is up by a huge amount. The use of authorized borrowers does not seem extensive enough to account for this. It must mean either that faculty in general are taking out more books on given trips to the library or, more likely, that the heavy users are vastly increasing their circulation levels.

The typical faculty user tends to concentrate his or her usage somewhat into two adjacent quarters, one of which is usually the summer. Some faculty users are less "circulation" users than "reference" users, taking from the library a set of core books that are tools for their field and that they basically never return except for recalls, resignation, or retirement. A fair number of faculty have used authorized borrowers at some point, but in general use of ABs is more common outside the major user community (except for the Divinity School). In the core user community, use of ABs is pretty episodic. Finally, a fair number of the faculty studies are not very heavily used, but are retained "on spec," for extensive use at some period in the year, for occasional use by a visitor, and so on. A small number of faculty studies see most of the actual use.

There is a core group of faculty users of Regenstein. This group is about 80 to 100 or more faculty. They take out an average of 100+ books a year. At least two-thirds of them have faculty studies. Most of them do not have authorized borrowers at any given moment, but up to half may have had an authorized borrower in the past. However they are themselves responsible for

by far the majority of their charges. Probably a third of them are in JRL at some point on any given working day in term time.

Core faculty users, like faculty users of JRL in general, are largely drawn from the Humanities and Social Science Divisions, about half from the former and 30% from the latter. The other group of heavy users comes from the much smaller Divinity School.

This core group without doubt includes most of the advisors of the equally evident core group of graduate students, considered below. These 78 faculty and 389 graduate students (= 467 people + perhaps another 20 to 30 heavy "reference users" who are not constant chargers of books) are roughly half of the total heavy user community of Regenstein and by themselves are responsible for upwards of 20% of the circulation in the entire library system, a staggering concentration in a library system with 33,000 cardholders, about 15,000 of them students and faculty. If we could remove reserve borrowing, no doubt the concentration would be even greater.

B. Student Usage

General Data

When it comes to usage of JRL we have not only the circulation and entry figures available for all library card-holders, but also the responses to the student survey of Spring Quarter 2005. (A copy of the survey's final report is available on request.) It is useful to review quickly the trends reported earlier in the general discussion of circulation and entry.

At present about 40% of all entries to Regenstein are by undergraduates, about 28% by PhD graduate students, and about 11% by MA students, most of the latter in the Divisions. Looked at in terms of rates, MA level students in the Divisions have in fact the highest rates of entry, an average of 114 per year. They are followed by PhD level students in Humanities, Social Sciences, and Divinity at about 105 entries per year. (PhD students more generally have much lower rates of entry.) Undergraduates average about 86 entries per year.

PhD level graduate students include some of the heaviest users of the library. Indeed, with 41 PhD graduate students over 300 books in 2003/4, 123 over 200, and 389 over 100, this group is from three to five times as numerous as faculty heavy users at each major level. (This fits fairly clearly with the notion that the typical faculty member has from three to five active graduate students.)

The general statistics thus show that Regenstein is becoming more of an undergraduate library, both because of the increasing number of undergraduates and their increasing likelihood of entering the library. At the same time, the vast majority of student research use (as indicated by circulation) comes from graduate students; the latter are responsible for three-quarters of all student circulation (system-wide as well as at Regenstein alone). So the picture from the general data is of a library that is at once a graduate research facility and an undergraduate study hall / student union.

Fortunately, the survey of Spring 2005 allows us to elaborate this picture in great detail. The survey was administered on the Web in May 2005 and garnered a 40% response rate, largely due to the rewards (one \$500 prize and 5 \$100 prizes, all awarded to randomly chosen completed forms). In the populations known from other data to be the principal users of the libraries the response rates were higher: 45% among divinity school students, and 52% among undergraduates and humanities and social sciences graduate students. Response rates were slightly but not substantially higher among women. Given the nature of the administrative data, our only other tests for

representativeness involved heavy library use. In the principal populations, respondents were clearly heavier library users than non-respondents, median annual circulation being 41 books among PhD student respondents versus 16 books among PhD student non-respondents and 13 books among undergraduate respondents versus 9 books among undergraduate non-respondents.

This effect was reversed among masters level students, a reversal caused by very high rates of response among MBA students who were complete non-users but who were apparently attracted by the prizes. The high level of response in this one particular non-using population somewhat biases the results for "students in general," and so we emphasize results within the major user groups, particularly in Regenstein: Humanities graduate students (HDGrads), Social Sciences Division graduate students (SSDGrads), Divinity School Graduates (DivGrad), and Undergraduates (UG). Unfortunately, problems in data structures prevent us developing weighted estimates except for undergraduates. We should underscore, however, that there is no particular reason to want "representative data for university students as a whole," since large portions of the student body never consider using the library system at all and should not be considered part of the universe in the statistical sense.

The survey involved questions about hundreds of aspects of library use. All questions (except where noted below) referred to library use in the current quarter, that is, Spring Quarter of 2005. Questions about physical libraries were in general answered with respect to a "most-used" library, while questions about electronic use were not connected to use in a particular library or even from a library at all.

A. The Favorite Library and Degree of Use

The first questions in the survey rated the relative importance of the various libraries in students' lives. Fourteen percent of respondents had no particular favorite among the libraries, while JRL was the favorite of 60%, Crerar of 10%, and Law and Harper of 6% each, and the rest were scattered. In general law students use only the Law Library (and few others do), SSA students use SSA, and BSD uses Crerar. HD graduates, SSD graduates, and Divinity graduates overwhelmingly (85 to 91%) use Regenstein. Three quarters of undergraduates use Regenstein, another 10% use Harper and Crerar, and the rest scatter elsewhere.

Because there are vastly different numbers of different types of students, these rates of preference do not tell us much about the mix of students in particular libraries. When we look at that mix, it follows patterns we might expect from earlier numbers. Regenstein is about 50% UG, 15% each for SSD and HD, 4% Divinity and the rest scattered. Crerar is 33% UG, 21% BSD, 18% PSD, 16% Med, and the rest scattered. Eckhart is half PSD, 35% UG and the rest scattered. Law is 80% Law, 8% UG, and the rest scattered. SSA is 89% SSA and the rest scattered. Harper is 60% UG, 14% SSD, 7% HD, 6% GSB, and the rest scattered. The sheer numbers of undergraduates thus make them a major presence in all but Law and SSA. It is noteworthy that Harper, the supposed undergraduate library, is in fact not much more "undergraduate" than is Regenstein.

Of the 86% of respondents who had a favorite library, however, a substantial number spent less than ten hours in that library in the entire Spring Quarter up to that point (typically sixth week, given the average time of response). The rate of this "minimal use" (as opposed to "non-use") varies considerably by group. Among the general heavy library use communities (Div,

SSD, HD, and UG) it runs about 15 to 20%. In these groups, non-use was lower than the 14% overall figure, so the total of respondents using their favorite library more than 10 hours runs about 75%. By contrast, among GSB respondents, this figure was 13%.

Looked at in terms of libraries, Law and JRL are the libraries with the smallest number of minimal users - 13% and 23% respectively. Harper by contrast was 40% minimalist respondents, Crerar 43%, Eckhart 51%, and SSA 59%. Unless we believe that relative likelihood of response (between minimalists and non-minimalists) varied between libraries, these are probably true estimates of the patterns of use. On this analysis, in all the libraries but Law and JRL on towards half the users are minimalists.

An important further question was whether the favorite library was a respondent's "primary study space." Of 3411 students who said JRL was their favorite library, only 1167 said it was their primary study space: 661 UG, 50 Div, 177 HD, 182 SSD. Given the response rates and the bias of the responses towards heavy users, one can multiply this number by around 1.6 or so to get a guesstimate of the number of students for whom JRL is their primary study space. This number is probably not less than 1500 but not more than 2000.

B. Major Usage Variables - Regenstein

Our description of JRL is based on the 2620 students who declared JRL to be their most used library and who had spent more than ten hours in it during the Spring Quarter of 2005. We asked these students fifty or so questions about their usage of JRL and employed a variety of formal analyses to simplify the results into interpretable scales. We ended up with five main scales and a number of orphan variables that seemed unrelated to the others. All questions were standard Likert scales for how often the respondent does some activity: never, on some visits, on about half the visits, on most visits, and always. The derived scales were all additive (for additional information, see the report of the library survey).

To shrink the 41 general usage questions into a number of fairly simple constructs took much time and experimentation. The following scales emerged after a careful inspection of correlations, a factor analysis, and theoretical interpretation of the data. Note that the scales do not precisely fall into the patterns we expected theoretically. Indeed in some cases they cut across groupings that were imposed in the order of questions, a fact that argues well for the validity of the data. In the end the following scales were developed:

Electronic Everyday life (EEL)
take a study break
make a cell phone call
receive a cell phone call
arrange to meet a friend
bump into a friend and take a break
do email
surf the web
shop on line
eat your own food
eat food bought in the library canteen

Social (SOC)

- use the all night space in JRL
- go to A-level to hang out
- go to A-level to meet new people

Research (RES)

- find something you sought on the shelf
- discover an interesting item while searching for something else.
- browse the shelves for information
- use the on-line catalogue
- check an item out
- use a checked-out item
- photocopy library material
- use a library printer

Wireless (WIR)

- use a laptop
- use a laptop to search the web
- use a laptop to write a paper
- use a laptop to download something from the web

Computer-based Assignments (COM)

- use a library computer to do an assignment
- write a paper on a library computer
- print an assignment
- print materials from the web or other electronic sources
- print personal material

Orphans

- photocopy own materials for a course
- photocopy personal material
- study material you brought into the library
- work with a group in a group study room
- work with a group in the reading rooms or stacks
- use a library computer to search the web for information
- ask a librarian a question
- check out a reserve item
- attend a class that met in the library
- read for pleasure
- take a nap

The most striking fact here is the existence of the everyday life scale. Originally, we expected a much larger "social" scale. However, obviously social items (hanging out on A-level) simply did not correlate as highly with things like cell-phone use and bumping into friends as we expected. It became clear that the various items listed in the EEL scale have in common the fact that they are part of running everyday life for students in the electronic age. They are the mechanics of daily living.

Although we have much detailed analysis of these scales, the principal messages about differences between groups are the following. It should be borne in mind that "graduates" here means, to a large extent, graduate students in the Humanities Division (30%), the Social Science Division (35%), and the Divinity School (10%).

1. There are no differences between undergraduates and any of the various types of graduates on the EEL scale. There are substantial differences within

these groups, but not between them.

2. Undergraduates are much higher than graduates on the SOC scale, which is hardly surprising since A-Level is set-aside space aimed at undergraduates.

3. Undergraduates differ substantially from graduates on the RES scale, by an average of one whole step on each question. This is a massive difference. Again, there remain substantial differences within groups, but the between group differences are large. Only 10% of HD,SSD, and Div grads are below the undergraduate median of 15 on this scale, and conversely only about 15% of undergraduates are above the graduate median of 23.

4. There is no significant individual correlation between EEL and RES. That is, whether or not an individual is a serious research user of the library tells us nothing about whether or not he or she conducts his everyday life in the modern electronic way or an older, paper-based way.

5. People who have wireless use it to do everything (the item correlations here are very high).

6. Undergraduates are much higher on the COM scale (computer-based assignments) than are graduate students.

7. Undergraduates are much more likely to bring their own material into the library to study. 75% of them bring such material on "most" or "all" visits. The equivalent HD and SSD figures are around 50%.

Some smaller matters are the following:

1. only those who are NOT the principal users read for pleasure in JRL (ie., UG, Div, SSD, HD don't).

2. Everybody naps occasionally, UG a little more than the others.

3. Nobody asks librarians a lot of questions, but UG least of all (two thirds of UG have never done so).

The broad picture that emerges here is, then, that graduates use the library for research while undergraduates use it primarily for study and assignments. This is hardly surprising, but the degree of difference is striking. Also striking is the emergence of a pattern of living everyday life in a technologized, somewhat social (by faculty standards) way, and the fact that this pattern is not at all related to research seriousness. Many of the activities that look to some faculty like "student union" kinds of activities - surfing the web, getting a cell phone call, and bumping into friends and chatting - are not highly correlated with the more purely social functions of the library and are as common in one type of student as in another (and as in faculty, we suspect). There is a purely social side to JRL, but it seems pretty small.

C. Specialized Usage Questions JRL.

A variety of questions attempted to pick up special kinds of usage in JRL or special aspects of library use. These were not analyzed as scales (although some of them figure in our analysis of heavy student users below.

Social (How often do you... - never, rarely, sometimes, usually)

Go to the library alone

Go to the library with another person but work separately

Go to the library with a study or working group

Study Habits (How often do you... - never, rarely, sometimes, usually)

listen to music while working in the library

eat food while working outside a designated cafe area

drink beverages while working outside a designated cafe area

Special services (Use in past year... - never, once, 2-5, 6-10, 11+)

- Special Collections classes
- Special Collections exhibitions
- Recordings
- Maps
- Archives
- Special Collections for research purposes
- CDROM data-cases
- On-line databases
- Microforms

The group differences here are clear. Undergraduates are more likely to use the library in groups. They are also somewhat more likely to listen to music while working and to eat and drink in the library. By contrast, most of the specialized research services are considerably more used by grads than UG: archives, special collections (as research site), CDROM data bases, microforms, even on-line databases. The last is important. Even though on-line databases are well-above other specialized services for all groups, it is still the case that they are much more heavily used by graduate students than by undergraduates.

Again then, the picture is one of the group differences expected. Graduates are more serious users of the library in all ways - even in such minor matters as not eating, drinking, or listening to music.

Although our focus here is on group differences, the underlying numbers make an important point vis a vis the long-run health of the library. Fewer than half the respondents have always obeyed library rules about not eating outside the canteen, and nearly a quarter of the undergraduates do this "usually," the highest level of response. The preponderance of undergraduates among JRL users means in turn that fully 17% of JRL users eat food outside designated areas on most or all of their visits. It is not clear whether this level is above or below the crisis levels noted in the 1970s, but we must clearly do something about it.

D. Desiderata for JRL

We asked an extensive battery of questions on desired qualities for the library - access to books, to stacks, to computers, free printing, color printing, tables, carrels, soft chairs, windows, staff, particular software, group study areas, canteen, microwaves, quiet areas, social areas, and various hours. There are some group differences among these, but for the most part they are not pronounced. In particular, there are no big intergroup differences in desire for internet access (very important to 50% across the board), available printers, tables to work at, carrels, and windows. Undergraduates are a little more likely to want color printing and comfortable chairs.

However, graduate students are MUCH more likely to value access to stacks, to physical materials outside the stacks, and to library staff. Fully a third of undergraduate respondents (and it should be remembered that these are the more bookish undergraduates) think that access to the stacks is "unimportant" or "only a little important." Half of them think access to physical materials outside the stacks (i.e., reference and bibliographical materials) is unimportant or only a little important.

Again, the separation of what might be thought of as "amenities" and research use is clear. Graduate students are more or less as interested in amenities as are undergraduates. But the two groups differ greatly with respect to availability of research materials.

E. Electronic Use:

Since electronic use is not tied to a particular library or, indeed, to any library at all, we have studied this issue across all respondents. There are 5676 respondents to these questions. Inspection of correlations revealed that the electronic items fell into two separate groups - e-reserves on the one hand, and everything else on the other. We have therefore lumped the electronic variables besides e-reserve use into a scale. These are Likert scales of usage (never, less than once a week, once a week, 2-5 days a week, and 6 or 7 days a week).

Electronic Variables

E-reserve use

E-Source scale (ELE)

RLG catalogue use

WorldCat use

On-Line reference use

Bibliographic search engine use

Library Subject Guide use.

E reserve is pretty widely used across the various divisions, but there is somewhat more use of it with undergraduates. By contrast, on the ELE scale graduates are much higher - about one whole step on each subitem - than undergraduates. (As with many of these statistics, the HD grads are slightly more "researchy" than the SSD and Div grads, although the difference between all three and the UG is much larger.)

The most important fact, however, is that within the JRL subsection of the data, the relation between ELE and RES scale (that is, between use of electronic sources and traditional, physical library use) is very strong and positive. The individual level correlation is .48, quite high for this kind of work. This means that use of electronic and physical materials increase and decrease together: heavy users of physical materials are heavy users of electronic materials, low users of one are low users of the other. There is thus no evidence for a substitution of the one for the other. On the contrary, use of the one probably furthers use of the other. (As we shall see from overall usage statistics, however, in the one case of access to journals, it looks like complete substitution has taken place.)

F. Heavy User students

Directing our entire analysis at categories of students seems inadequate. There are clearly heavy library users among undergraduates as well as among graduate students. We have thus created a heavy user scale that tries to capture this possibility as well as to recognize that there are - for students as for faculty - different kinds of heavy library users.

We defined heavy users in five areas. The first is the RES scale, a traditional library use scale summing eight items that ranged over five levels: never, on some visits, on half the visits, on most visits, always. Scale values of 16 or less (an average of 2 on each item) were coded low. Scale values from 17 to 24 were coded medium. Scale values above 25 were high. On the ELE scale, (5 items, 25 the possible high), similarly, below an average of 2 (i.e., scale value of 10) was low, between 2 and 3 medium, and above 3 high. For circulation, we coded up to 50 charges as low, 50 to 100 as medium, and 100+ as high. For the on-line database item (a single item) we

assigned up to 3 as low, 4 as medium, and 5 as high. The special services scale involved archives, special collections, CDRoms, and microfilms. The constituent scales had five item ranges (from never used in the past year up to used 11 or more times in the past year). To be high one had to be in the top two levels on at least two of these. To be medium one had to be in the top level on one and medium in another.

Given these definitions we have the following levels of heavy users, looking only at the four principal user groups and each of the five major scales. Note that the left hand figures add to 100% across the rows, while the right-hand figures add along the columns and total to something less than 100% in most cases because there are other groups not shown that make up the rest of the 100%. Taking the first row of the left-hand tables, the tables tell us that on the main RES scale, 24% of Divinity users are low-level users, 46% are medium-level users, and 30% are high-level users. The right hand table tells us that divinity students make up 2% of all low-level users on RES, 5% of all medium-level users, and 7% of all high-level users. As the right hand tables show, the sheer numbers of undergraduates imply that their heavy users make up a substantial part of the heavy-user community as a whole, no matter what the scale we look at. The impact of the increased size of the College is particularly clear in these tables.

Table 8. Student Use (Light, Medium, Heavy) by Major Student Grouping

User percentiles within group				Level Percents by Group		
RES	L	M	H	L	M	H
Div	24	46	30	2	5	7
SSD	23	45	32	8	23	30
HD	10	46	44	4	22	38
UG	66	27	7	73	43	21
ELE						
Div	47	35	18	3	4	5
SSD	35	42	22	11	23	29
HD	28	44	28	8	22	33
UG	67	27	6	66	44	24
CHK						
Div	52	30	18	3	7	7
SSD	52	28	20	13	29	31
HD	35	34	31	8	33	46
UG	88	9	3	65	29	15
OLDB						
Div	38	18	43	3	5	5
SSD	31	12	56	11	16	27
HD	28	13	59	9	16	26
UG	61	15	24	65	56	35
OTH						
Div	90	4	6	4	4	5
SSD	85	8	7	16	36	31
HD	84	6	10	15	26	36
UG	96	2	2	56	27	22

Combining these figures yet again gives us a measure of overall heavy use at the individual level. Particularly high users are users who are high on several of these different types of use. The following table gives percentages of each group of users who are high on 0,1,2,3,4, or 5 of these scales. Thus, 38% of Divinity students were not high on any of the five scales, 30% were high on one of them, 14% on two of them, and so on.

Table 9. Levels of Heavy Student Use by Major Student Grouping

	% of Individuals with N "high-level" scales, within group					
	0	1	2	3	4	5
Div	38	30	14	13	5	
SSD	23	38	22	12	4	1
HD	17	31	27	17	6	2
UG	68	24	6	1	1	

It is plain from this table that graduate students are far more likely to be heavy users and that the three graduate groups fall in the familiar order of humanities highest, social science and divinity only slightly lower but almost tied. But if we look at this table the other way - as in the right-hand tables just seen, we see again that sheer numbers mean that undergraduates constitute a not insignificant group among the heavy users, even though the average undergraduate is extremely unlikely to be even a mildly heavy user. (Nearly all the 24% of undergraduates who are high on one thing are high on ELE.) Reading the first row of the table below, we see that Divinity students are 3% of all users who are heavy on no scale, 4% of users heavy on 1 scale, 5% of all users who are heavy on two scales and so on. The first bottom row gives actual numbers on which these percentages are based, the raw column totals. The second bottom row gives the cumulative total of these raw column sums from the right. Thus, there are 13 users high on 5 scales, 56 high on 4 (and therefore 69 high on four OR five), 163 high on three scales (and therefore 232 high on three, four, or five) and so on.

Table 10. Heavy Use Population Levels by Proportion from Various User Groups

	Of all heavy users at a given level, percents by group					
	0	1	2	3	4	5
Div	3	4	5	8	9	
SSD	8	23	31	33	30	31
HD	5	18	34	44	46	69
UG	72	46	23	12	14	
Total	1309	736	330	163	56	13
-Cum	2607	1298	562	232	69	13

These latter figures are particularly important because they describe the population from the point of view of the librarians who are dealing with questions and problems. It is the contrast of these numbers with those in the table above that explains why the faculty think undergraduates never have much to do with the research library while the library reference staff thinks that undergraduates are an important part of the serious library user community.

The size of the pool doesn't affect the faculty view, which is based on appraisals of random samples of students (i.e., in classes). But it has immense effects on the librarians' view.

The numbers in the last row more or less corroborate our earlier notion that there are around four or five hundred heavy student users of the library. If we think back to what "high" means here, it means heavy use on scales all but one of which (circulation) is itself already a scale of multiple different kinds of use. To be high on two of these scales is to be a very heavy user, and students who are high on three of them are very, very active library workers indeed. It is useful to finish this analysis with the group percentages of these cumulative figures:

Of those high on four or more scales:

51% are HD, 30% SSD, 8% Div, and 11% UG

Of those high on three of more scales:

46% are HD, 32% SSD, 8% Div, and 12% UG

Of those high on two or more scales:

39% are HD, 32% SSD, 6% Div, and 19% UG

Of those high on no scales or on one scale:

10% are HD, 14% are SSD 4% are Div, and 63% are UG.

So the survey-based analysis of individual heavy users fleshes out and at the same time corroborates what we have seen earlier: the heavy student users of JRL are first and foremost humanities division graduate students, followed not all that distantly by Social Sciences graduate students. These two groups together are no less than 70% of the heavy student user community no matter how we look at the data. They are in reality probably more like 80% of that community.

An important footnote concerns the development of heavy use in the undergraduate career. The patterns observed neatly follow what we would expect given the Chicago curriculum. (We omit the tables to save space. See the complete survey report for details. It should be noted that we do not actually have over-time data on individuals, but rather data by year in college. There is, however, no reason to expect major period effects.) Heavy use increases monotonically in each of the five categories over the four years: in RES to 12% in the fourth year, in ELE to 10%, in CHK to 7%, in ONDB to 30%, and in OTH to 2%. RES, ELE and OLDB all take a big jump from first to second year, as students leave the core and begin to write research papers. The first two (RES and ELE) as well as CHK take a big jump from third to fourth year, as students do BA papers. In OLDB and OTH, the shift in third to fourth year is not middle to high, but low to middle. It is very evident where the main transitions in the curriculum are. We should also note that the generally low level of undergraduate library research use clearly reflects a curriculum organized largely around detailed reading of classical texts.

E. Miscellaneous

On-line database usage: Much of the sense that the library is changing radically comes from the sense that electronic sources are coming to dominate

not only the kind of undergraduate information-seeking that used to go to encyclopedias and other first-line reference works, but also parts of the formal research process itself. The data from JRL seems to show pretty clearly that actual replacement of former research usages is happening only in one area, that of journals. It seems pretty obvious that nearly all access to journals is now electronic rather than physical. And it seems pretty clear from the sheer level of use that much of this reference to journals is probably new, brought about by sheer availability.

The U of C had in 2005 1.6 million hits on JSTOR and 1.3 million hits on Elsevier Science Direct. Full article viewing was 382,000 on the former and 415,000 on the latter. Following at a distance are Nature Publishing Group at 192,000 viewings, EBSCO Academic Search Premier at 111,000, Web of Science at 66,000, Wiley Interscience at 65,000, EBSCO Business Search Premier at 34,000, and the MLA databases at around 20,000. That is a total of 1.3 million article viewings on the scholarly databases. Beyond this is the staggering 2.6 million documents retrieved on Lexis-Nexis, the one database that most of our undergraduates come to Chicago having already used. All this usage is coming from a University community of 1100 senate faculty and 14,000 students (counting every type of student). (There is some suspicion that the Lexis-Nexis figure is an artifact; our typical figure is around half a million.)

Much of this is instructional use. The electronic databases are rapidly replacing the e-reserve technology that replaced the course-pack technology that replaced "traditional" reserve in the 1980s. It seems clear that actual accessing of journal articles must be vastly up from its earlier levels. Since these "accesses" are replacing everything from the five second physical scan of an article's contents to a five-hour careful reading, however, it is not clear whether actual ingestion of the articles' content has risen at all. What we do know, however, is that physical access to journal content has plummeted. The library has already canceled physical subscriptions to such major publishers as Sage (from whom we used to receive dozens of physical journals) without undue complaint.

Beyond journal use, it is not clear what the use of electronic data-bases means. The library subscribes to numerous specialized databases that are accessed from 50 to 5,000 times a year. These appear to be an essential part of current research practice, but their users are clearly also extremely heavy users of print materials.

Temporal Patterns: Regenstein usage flows quite rhythmically through the year, the quarter, the week, and even the day. Although these patterns may seem obvious, they have important effects on use of the building. The data here are daily borrower and circulation figures.

First, the annual and quarterly patterns: Library usage is grouped into three kinds of periods: the three main quarters, the summer quarter, and the breaks. The quarters are eleven weeks, showing pretty steady usage over the teaching weeks with a slight drop in exam week. The weekly low (Sunday) follows a characteristic cycle, falling over the first two weeks of quarter, rising to fifth and sixth (midterm) week, falling suddenly, and then rising or (in the warm spring) staying level through exam week. Autumn and Winter are at about the same level overall, with Spring very slightly lower.

Summer quarter is at about half the level of the other quarters in terms of checkouts, but considerably less in terms of borrowers; in summer, the modal borrower is a faculty member, who will likely take out more books than an undergraduate. In general, books charged per borrower per day is higher in the break periods and in the summer than during the terms, because faculty and graduate students who are advanced (and hence likely to be teaching) regard breaks as times for research. Breaks are quite low for borrowing, especially the holiday break, because both MLA and AHA - the professional associations of

two of the heaviest user populations - meet in that period.

The weekly pattern is even more striking. Charges start the week off strong (Mondays average 1500 charges over the 2003/4 year), then fall slightly Tuesday (1457) and a little more Wednesday (1438). They drop sharply Thursday (1257) and further Friday (1122) before plunging on the weekend (718 on Saturday and 653 on Sunday). The number of borrowers follows the same pattern, with a slight reversal on the weekend (591, 578, 561, 488, 408, 225, 233). Surprisingly, however, books per borrower follows a different pattern (2.59, 2.68, 2.74, 2.54, 2.76, 3.41, 2.93). The distinctly higher rates of borrowing on Saturday and Sunday bespeak researchers - most probably faculty - coming in to work on the weekend when the library is relatively less busy.

Finally, the library has a very distinct diurnal rhythm, which varies little during the week. The data here are a little dicey, as it turns out that people's cards are not changed in status instantly upon change (e.g., when undergraduates become alumni. There is therefore a large other category in the database, of people whose cards have been removed from one status but not yet posted to their new status [or canceled].) Our analysis is based only on data NOT in the other category. Note that we are here treating entry as usage. Data cover the entire winter quarter of 2005. On the left, the table shows the 5-day average of percentage of all entries by each category that occurred in the indicated time interval. On the right these averages are added to give a cumulative percentage by the end of the time interval indicated.

Table 11. Entries of Major User Groups to JRL by Time of Day - Weekdays

Hours	In the period indicated			Cumulative across the day		
	UG	PhD	Fac	UG	PhD	Fac
6-8	0.00	0.00	0.01	0.00	0.00	0.00
8-10	0.05	0.10	0.15	0.05	0.11	0.16
10-12	0.13	0.17	0.18	0.18	0.27	0.34
12-2	0.18	0.21	0.19	0.36	0.49	0.53
2-4	0.16	0.20	0.22	0.52	0.69	0.75
4-6	0.15	0.16	0.16	0.67	0.85	0.91
6-8	0.13	0.09	0.06	0.80	0.94	0.97
8-10	0.11	0.04	0.02	0.91	0.98	0.99
10-12	0.07	0.02	0.01	0.98	1.00	1.00
12-2	0.02	0.00	0.00	1.00		

While the results are hardly unexpected, they are nonetheless important. Nearly a third of faculty entries for the day are before noon, while only about a sixth of undergraduate entries are that early. At the other end of the day, over 90% of faculty entries occur before 6PM, when over a third of undergraduate entries have yet to come. PhD graduate students fall into between these two extremes but are much closer to faculty than to undergraduates.

What this means is that the library is to some extent temporally zoned. The table below gives the percentages of entries in a given two hour block, over the whole week, that are from various classes of entrants. (These figures are net of the unclassified cards that are in transition. The total number of entries [over the quarter] is shown in the final column.) The PhD-level graduate students are the most steady group. They are one third of the entrants in each two hour block from 8AM to 6PM. Masters-level are likewise a steady 10% of the entrants from 8AM to sometime after 10 at night. Undergraduates are about 40 to 50% of the building's entrants from 10AM until

Table 13. Proportions of JRL Entries in a Given Period by Various User Groups
 - Sundays

Hours	UG	MA	PhD	Oth	Fac	ANF	Lec	Sta	N
6-8	.00	.00	.00	.00	1.00	.00	.00	.00	1
8-10	.15	.15	.15	.00	.23	.15	.00	.15	13
10-12	.56	.13	.14	.03	.06	.04	.00	.04	224
12-2	.52	.14	.27	.02	.01	.01	.01	.02	3853
2-4	.51	.14	.29	.02	.01	.00	.01	.02	3801
4-6	.56	.13	.25	.02	.01	.01	.01	.01	2963
6-8	.66	.10	.20	.02	.01	.00	.00	.01	3084
8-10	.71	.10	.15	.02	.00	.00	.00	.01	2263
10-12	.78	.07	.12	.02	.00	.00	.00	.01	1323

In short, only before 10AM is JRL ever below 40% undergraduate. Sunday is the most heavily undergraduate day. During working days, JRL is quite steady at 40-45% undergraduate, 40% PhD and MA level graduate students, about 6-7% staff, about 6% all types of instructional staff (faculty, ANF, lecturers), and the remaining few percent scattered in other statuses. At night, JRL is to a large extent an undergraduate study hall.

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