Summary: Usage of College Scheduler for spring 2021

Background and Methods: In 2020, Salt Lake Community College purchased College Scheduler, a tool that allows college students to build complete course schedules when registering for classes each term. The tool connects to Banner and DegreeWorks; it also allows students to specify preferred class times and campuses. This report analyzes preliminary data on students' use of College Scheduler during the spring 2021 registration period.

Key Findings: Of students who registered at SLCC in spring 2021, about 41% logged in to College Scheduler at least once, and about 17% used functionality such as searching for courses or entering breaks.

We found no major differences in students' usage of College Scheduler by demographic group (gender, age, etc.). However, we found that new students were substantially more likely to search for classes in the tool than returning students, which might suggest that new cohorts of students are learning to adopt College Scheduler into their registration routines in a way that older cohorts did not. In addition, we found that continuing students with a lower prior GPA, and fewer prior credits, were more likely to use the tool. Although we can't be certain whether College Scheduler concretely helped these students, this pattern is certainly suggestive that the tool addresses a felt need among students who are struggling academically.

College Scheduler provides data that has the potential to help SLCC better understand students' scheduling needs: the times when students prefer to take classes, the courses for which there is unmet demand, and whether certain groups of students are systematically disadvantaged in building an ideal schedule. Although adoption by students is not yet widespread enough to allow us to draw inferences about the student body as a whole, there are reasons to be optimistic that College Scheduler data will become increasingly valuable over the next few years.

Caveats and Recommendations: The more students who use College Scheduler when registering, the better we will be able to use its data to learn about students' scheduling needs. We recommend that SLCC encourage greater adoption of College Scheduler by students, and also that SLCC explore ways to cache historical data from the tool so that we can get a better sense of students' changing needs across semesters.

Background

In 2020, Salt Lake Community College purchased College Scheduler, a Civitas tool that allows college students to build their course schedules when registering for classes each term. The tool is available through mySLCC and connects to Banner: students can search and register directly within the tool. Additionally, the tool is able to block out times when the student doesn't want to be in class, search for multiple courses at once, and build a complete schedule in just a few clicks. The SLCC Scheduling Committee would like to be able to use data from this tool learn more about students' scheduling needs.

SLCC purchased the tool in the spring of 2020 and implemented it in July 2020. This report describes SLCC students' usage of College Scheduler during registration for spring 2021, the first semester for which College Scheduler was available throughout the entire registration period.

DATA AVAILABLE FROM COLLEGE SCHEDULER

Three major types of data related to College Scheduler use are available to us via manual extract from the College Scheduler reporting website.

Logins

We have records of which students logged in, and when. This data can give us a sense of how many students are using College Scheduler and when they tend to do so.

The completeness of this dataset is not clear; there are students for whom we have no login record but *do* have records of other activity in College Scheduler. For example, 339 of the 5,260 students who searched for at least one course for spring 2021 in College Scheduler have no login record.

Courses

We have records of courses students have searched for in College Scheduler. These records are at the course level; that is, students can search for "ENGL 1010" but not "section 201 of ENGL 1010". This data has the potential to give us a glimpse of unmet demand for certain courses, by allowing us to identify courses that students are searching for but not signing up for.

Breaks

College Scheduler allows students to specify "breaks" during which they don't want to take any classes. When students subsequently search for classes, sections that meet during those breaks are filtered out. This data has the potential to help us understand what times of day and days of the week SLCC students would prefer to take classes.

One major drawback of this dataset is that in the exports from College Scheduler, older breaks are "overwritten" by newer breaks that a student has specified. Therefore, it would be very difficult to reconstruct what breaks students wanted in a prior term. If SLCC wants to use this data regularly, we will need a more robust system for storing historical break data, perhaps in the data warehouse.

DATA NOT AVAILABLE FROM COLLEGE SCHEDULER

College Scheduler has several other functionalities whose data we are not able to access.

Campuses

Students can specify which campuses they are willing to take classes at; College Scheduler will not display sections on other campuses. If this data were available to us like the break data, it might help us track demand at different SLCC campuses.

Course status, part of term, and instruction mode

Similarly, students can filter by course status (open, full, waitlist), part of term, and instruction mode (face-to-face, online, etc.). If this data were available to us, it might allow us to better understand students' preferences.

Course search methods

There are several ways students can specify a course they want to take in College Scheduler. The first, and most basic, is to choose the course subject and number directly. However, there are three additional search interfaces that allow students to filter the list of courses they choose from:

- Section attribute (e.g., the section fulfills the Physical Science requirement, or is a Service Learning section).
- DegreeWorks (students see only courses in their DegreeWorks plans).
- Instructor (students choose an instructor and then see courses the instructor is teaching).

All three of these options lead to the same result: students specify a particular course (e.g., MATH 1010) that they want to add to their schedule. In the case of the instructor search function, we *think* that sections are further restricted to sections taught by the requested instructor, but we are not completely certain of this.

The data available to us does not include information about how students chose courses to search for; that is, we cannot see whether students are searching for particular instructors, or whether students are pulling in courses from their DegreeWorks plans. In other words, we can see the list of courses students searched for, but not the query criteria that generated that list of courses. If the query data were available to us, it might allow us to better understand how students choose what courses to take.

Recommended schedules

When students search for a set of courses, College Scheduler generates a set of complete schedules that contain those courses and conform to the student's other specifications (preferred campus, breaks, etc.). However, we are not able to see what full schedules are being recommended to students, nor are we able to see whether students follow those recommendations (in whole or in part). If that data were available to us, we might be able to learn more about whether the recommendations generated by the tool are actually useful to students.

Rate of usage

USAGE BY STUDENTS WHO ENROLLED IN SPRING 2021

Figure 1 shows the percent of students (and raw counts in the bar labels) who eventually enrolled in spring 2021 who interacted with College Scheduler during the registration period. About 41% of students logged in at least once, and 17% searched for a course or specified a break. (Recall that the logins do not necessarily include all students with College Scheduler activity.)
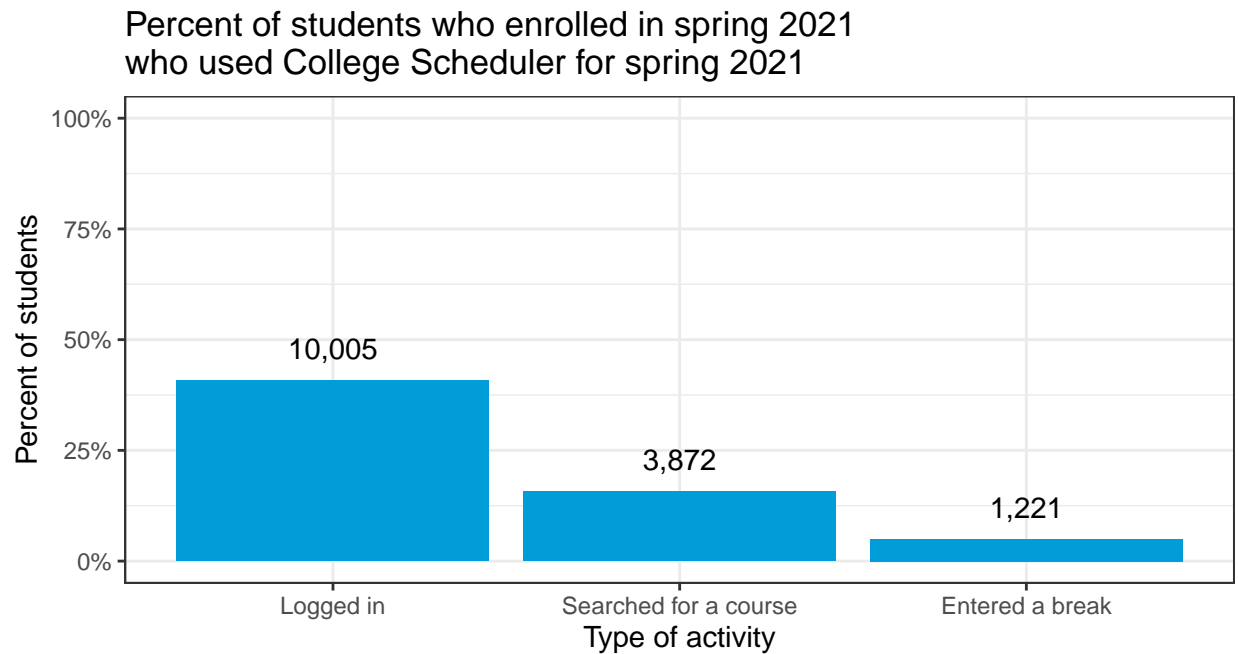

Figure 1: Usage of College Scheduler by students who eventually enrolled in spring 2021. Labels show the number of students who engaged in each type of activity.

USAGE BY DEMOGRAPHIC GROUP AND ACADEMIC HISTORY

Figure 2 shows usage of College Scheduler broken down by demographic group. For the most part, we *do not* see large differences between groups in students' likelihood of using the tool.

By contrast, figure 3 on the following page shows usage of College Scheduler broken down by academic variables. Unlike demographic variables, these variables *do* sometimes show substantial differences in students' likelihood of using the tool. Specifically, degree-seeking students and students who were new in spring 2021 were more likely to search for courses in College Scheduler than other students. (Among new students, there was no substantial difference between recent high school graduates and other new students.) In addition, students with a lower prior GPA or fewer prior credits were somewhat more likely to use College Scheduler than students with a higher prior GPA or more prior credits. Although we can't be certain whether College Scheduler concretely helped these students, this pattern is certainly suggestive that the tool addresses a felt need among students who are struggling academically.

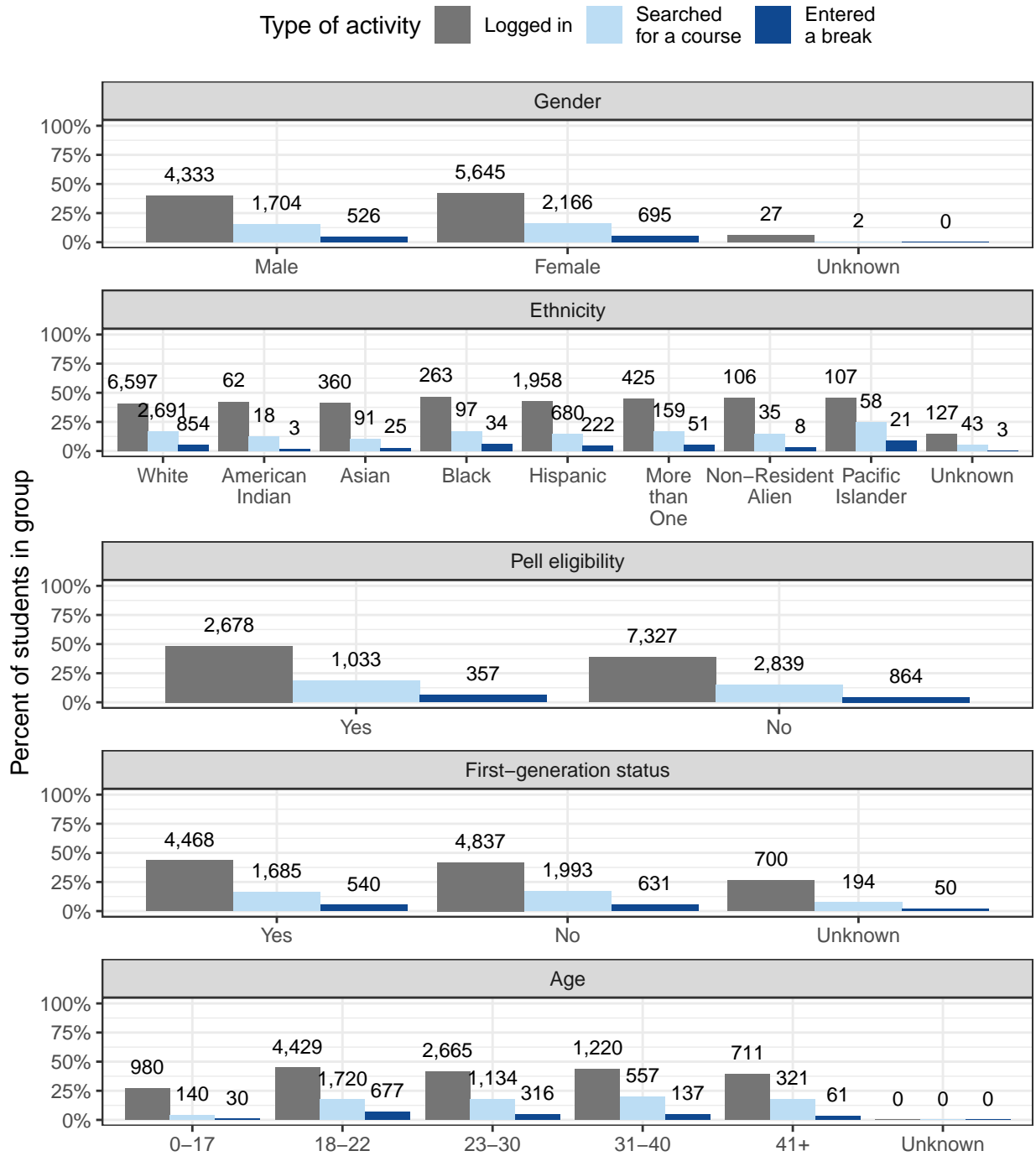## Percent of students who enrolled in spring 2021 who used College Scheduler, by demographic group

Figure 2: Usage of College Scheduler by students who eventually enrolled in spring 2021, by demographic group. Labels show the number of students in each group who engaged in each type of activity.

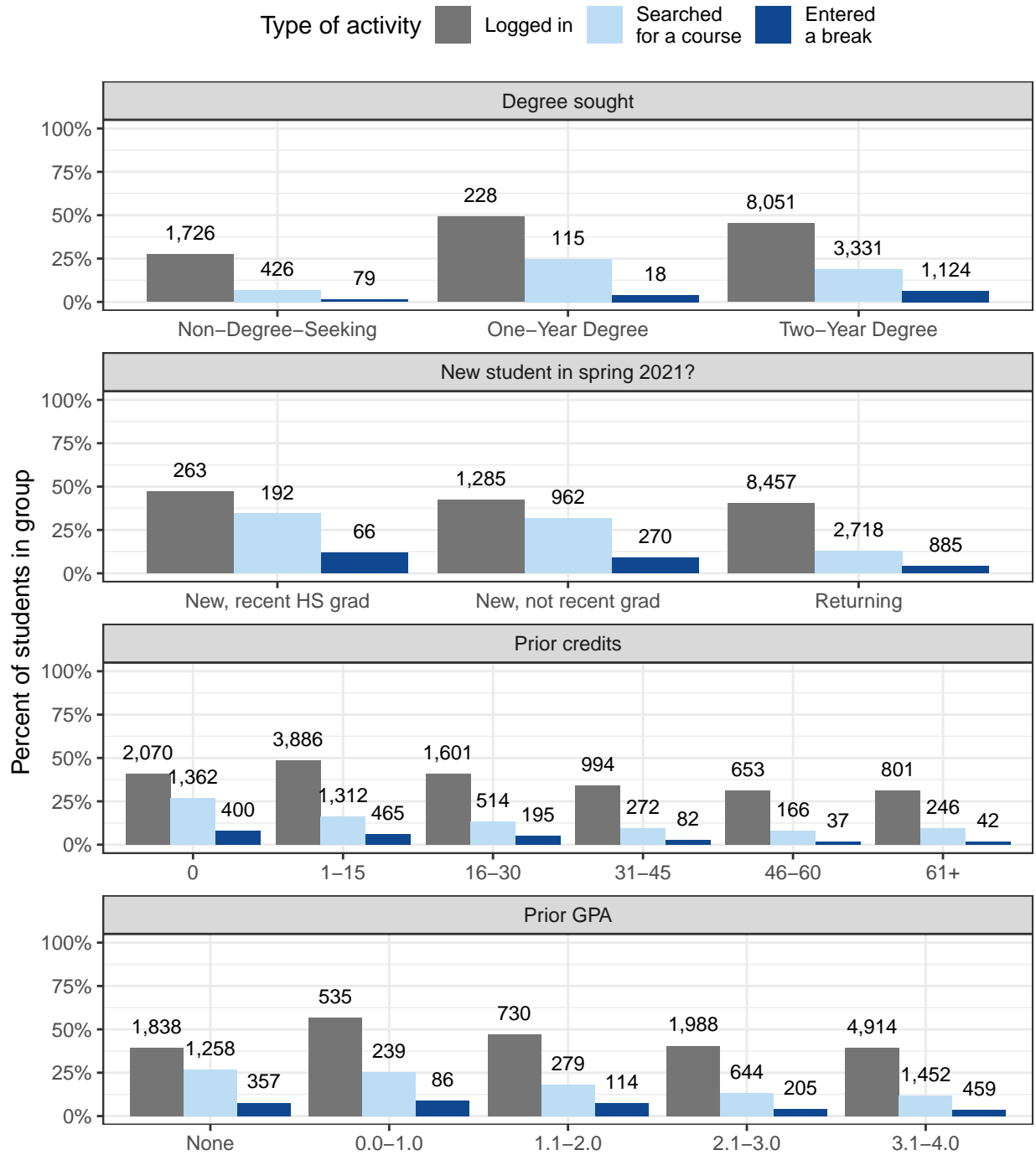## Percent of students who enrolled in spring 2021 who used College Scheduler, by academic history

Figure 3: Usage of College Scheduler by students who eventually enrolled in spring 2021, by academic history. Labels show the number of students in each group who engaged in each type of activity.

USAGE TIMELINE

The number of students using College Scheduler increased steadily throughout the spring 2021 registration period, with unsurprising drops in usage around Thanksgiving and Christmas.
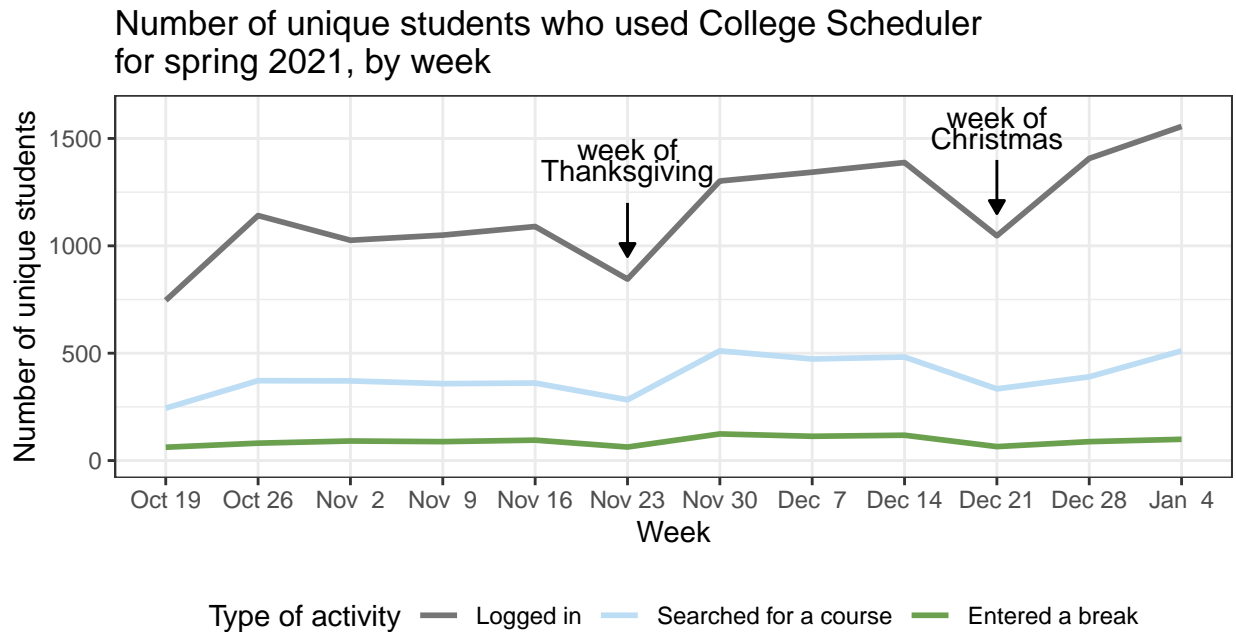
Figure 4: Usage of College Scheduler, by week and activity type. Times are restricted to the registration period for spring 2021. Each line tracks the number of unique students who performed one type of activity in College Scheduler, by week.

Breaks

As noted above, the breaks that students enter into College Scheduler have the potential to let us better understand when students would prefer to take classes. This section explores what kinds of things we might be able to learn from these breaks. Because only 2,031 students have ever entered a break into College Scheduler, and because we saw earlier that new students are more likely to enter breaks than returning students, the findings of this section should *not* be interpreted as representative of SLCC students in general. Rather, they illustrate how the break data could be used in the future, as more students adopt the tool.

All of the analyses below ignore weekends. Few students specified breaks on weekends, and few classes are offered on weekends anyway. Moreover, the classes that do occur on weekends, and the students who take them, are likely to differ from weekday classes in substantive ways that merit their own analysis. Unless stated otherwise, these summaries combine breaks for fall 2020 and spring 2021.

MOST-REQUESTED BREAK TIMES

The heatmap in figure 5 shows the number of students who requested a break at various times during the week. Darker yellow means that more students wanted *not* to take class during that time. Friday, especially Friday morning, clearly emerges as the least desirable time.
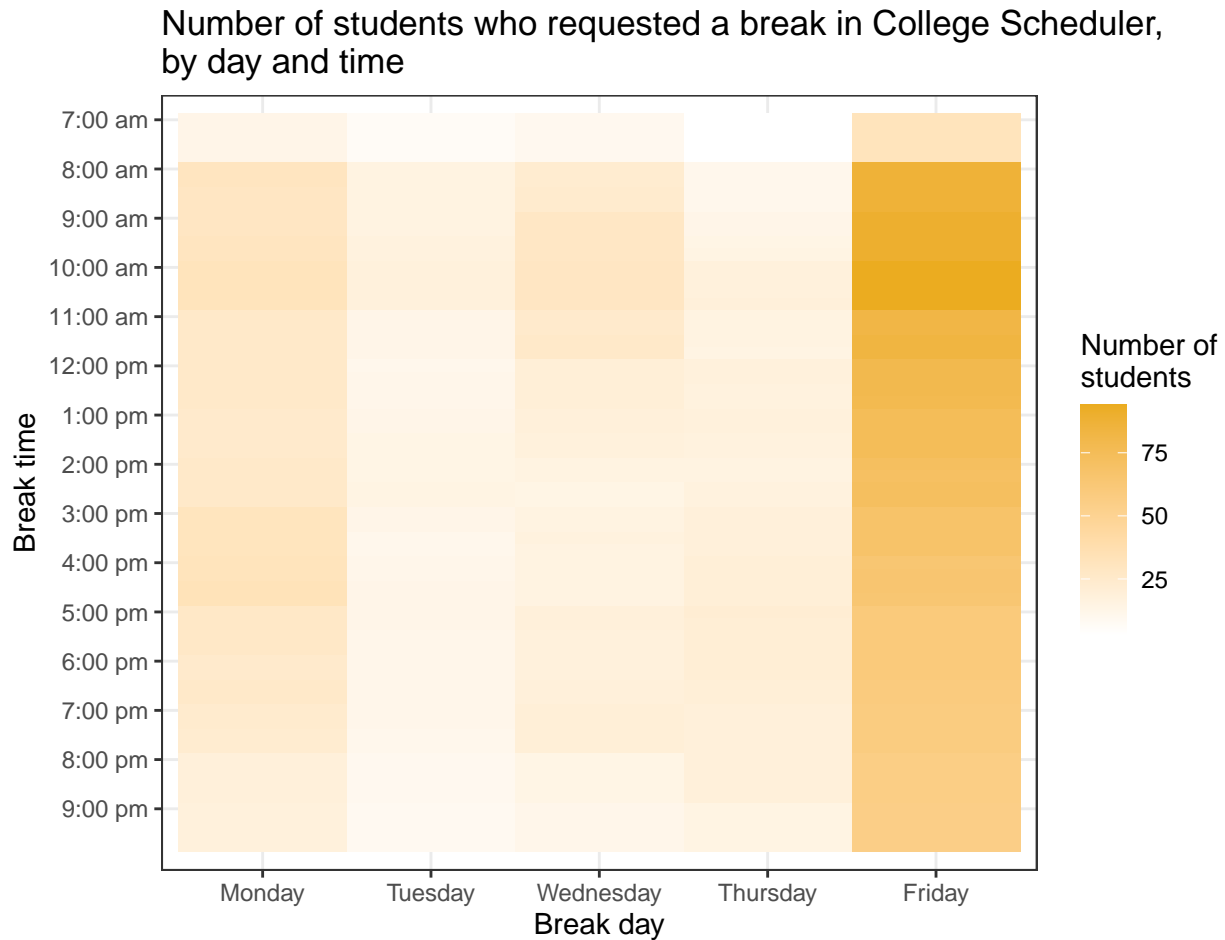

Figure 5: Number of students who requested a break in College Scheduler, by day and time. Limited to 7:00 AM – 10:00 PM on weekdays. Times are broken into 15-minute blocks.

Figure 6 shows how demographic groups differ in their preferred class times. Darker yellow means that students in that group were less willing to have class at that time, *relative to students in other groups*. The relative nature of these preferences is important; for example, although men were more likely to request breaks mid-day on Thursdays than women, this does *not* mean that women actually *preferred* that time; rather, men's dispreference was stronger than women's dispreference.

Again, our dataset is sufficiently small that we strongly discourage drawing specific conclusions from this figure (for example, that Hispanic students avoid Tuesday/Thursday classes). Patterns like these *might* hold up in a larger and more representative sample, but they might not. What this figure shows is that some groups of students might benefit from classes scheduled at particular times, but we need more and better data to be sure of what those differences are.

Relative dispreference for class times, by demographic group
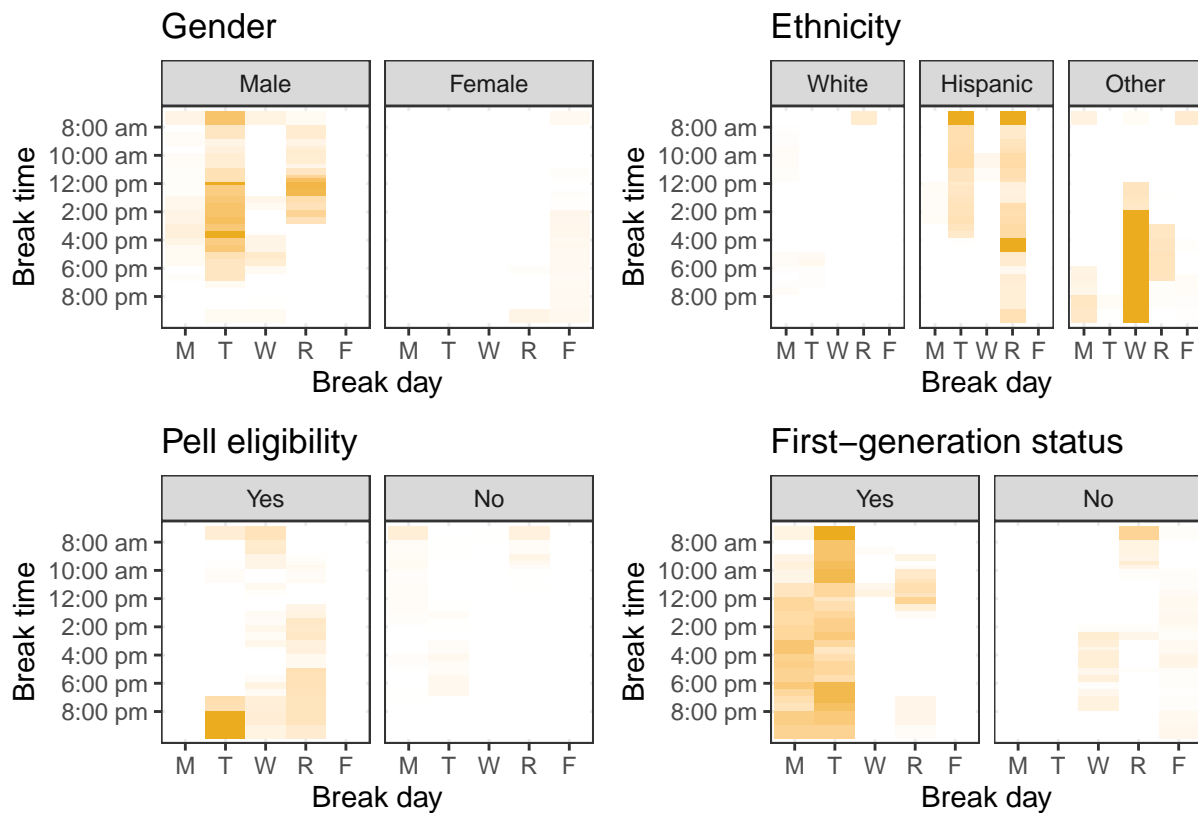

Figure 6: Relative dispreference for class times, by demographic group. Limited to 7:00 AM – 10:00 PM on weekdays. Times are broken into 15-minute blocks. Slots that are more yellow are more dispreferred by students in that group *relative to students in other groups*. The color scale (not shown) was computed by comparing the observed dispreference within each group/slot to the expected dispreference under the null hypothesis that all groups are the same; it represents relative dispreference, not a raw count of students.

BREAK LABELS

When a student enters a break in College Scheduler, the student can label that break with a description of some kind. These break labels offer a potentially rich source of information about what constraints students have on their time outside of class; however, since the break labels are free text (and very short), they turn out to be rather limited in practice. Here we offer some general observations about break labels:

- By far the most common category was work; 57% of breaks include the string "work" or "job". Additional labels appear to refer to specific jobs: e.g., "Babysitting", "Northrop Grumman".
- No other category comes close. 3% of breaks mention "sleep", "rest", "nap", or "zzz"; 1% mention "kid" or "kids". These numbers are certain to underestimate how many students actually have scheduling constraints for these reasons.
  - It is likely that most students didn't explicitly specify a sleep break because they sleep

during the nighttime hours when SLCC offers no classes anyway. (Students who work atypical hours might be more likely to specify a sleep break, but with our limited dataset this is difficult to evaluate.)

- Many labels suggest family obligations, but in such a wide variety that they are impossible to flag automatically. Students referred to "Kindergarden Drop", "mother inlaw dialysis", "Pickup Teagan", and so on.

• Some labels are generic: "break", "no classes", etc. It is impossible to know why students designated those times as breaks.

• Occasionally, break labels give us hints about students' attitudes towards certain time slots. Although they are tantalizing, break labels such as these are too scattershot to allow for systematic analysis.

- "Hell no" (1:00 AM – 9:00 AM on Fridays)
- "I dont wanna be in class at those times" (5:00 PM – 9:00 PM Monday – Friday)
- "too early" (7:00 AM – 8:00 AM Monday – Friday)

• A handful of students (16 total) mentioned "weekend" for a break that includes a Friday. Although the numbers are small, this pattern suggests that some students may avoid taking classes on Friday because they consider Friday to be part of the weekend.

Figure 7 distinguishes between breaks that mentioned "work" or "job" and breaks that did not. Keeping in mind that many of the "Other" breaks may well have been work-related, it nevertheless seems clear that work-related and non-work-related responsibilities follow similar, but not identical, patterns.
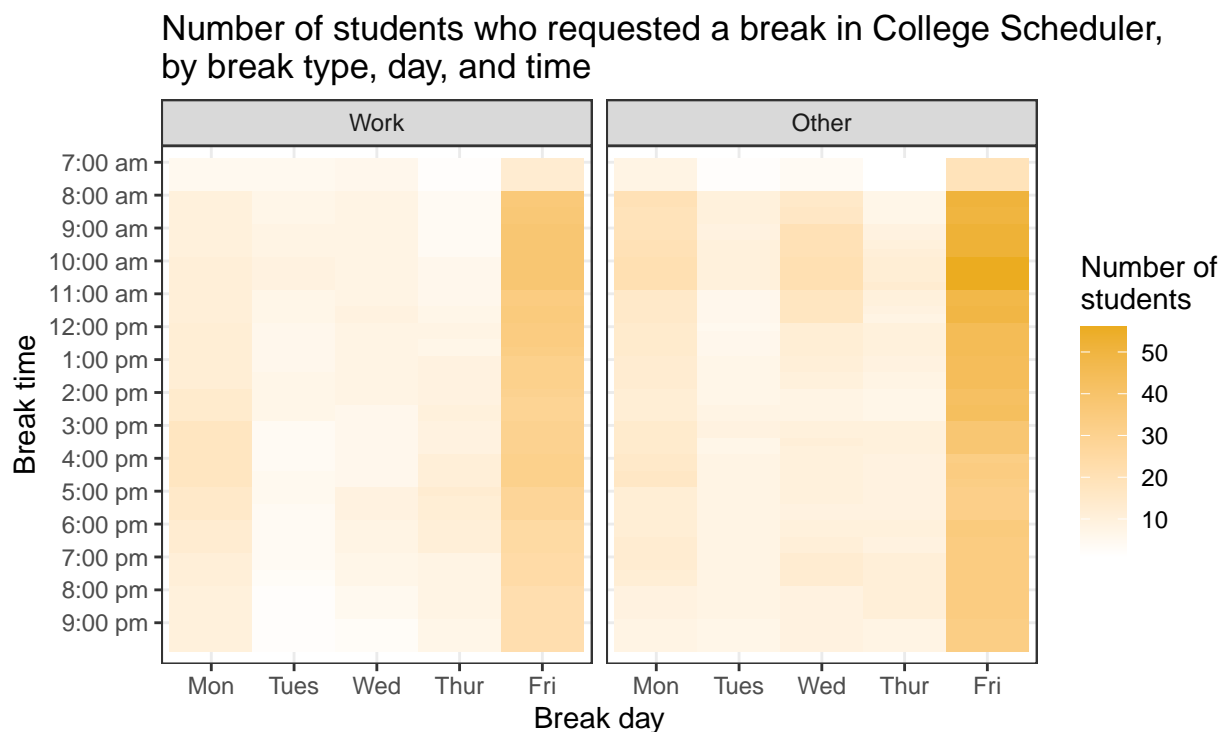

Figure 7: Number of students who requested a break in College Scheduler, by break type, day, and time. Limited to 7:00 AM – 10:00 PM on weekdays. Times are broken into 15-minute blocks.

STUDENTS WHO TOOK CLASSES DURING DESIRED BREAKS

One intriguing application of the break data might be to investigate how often students end up taking classes at times when they would have preferred not to. We could do this by comparing the meeting times of sections students actually register for to the times they specified as breaks. When we do this with our current data, we find that only a tiny number of students register for class during a break: $< 1\%$ of students who specified at least one break.

However, we have reason to be suspicious of this rosy picture. If College Scheduler puts a hard filter on search results based on students' break times, then it's likely that students who can't find the classes they need may simply change or remove their specified breaks in order to find more options. In other words, we're not seeing all the times when students *wanted* breaks; we're seeing all the break times that were left after students were forced to change their preferences to accommodate the available sections. Since figure 8 is limited to students who entered at least one break in College Scheduler, we may be looking at students who couldn't find classes at the times they wanted and went outside College Scheduler altogether to register.

For this reason, we view figure 8 as suggestive only. In addition, the tiny group numbers should deter us from trying to draw inferences from this dataset about group differences. If we are able to learn more about how students use College Scheduler, and if we are able to cache historical data, we *might* be able to explore, for example, whether students of color are less likely to be able to create their desired schedule than White students.
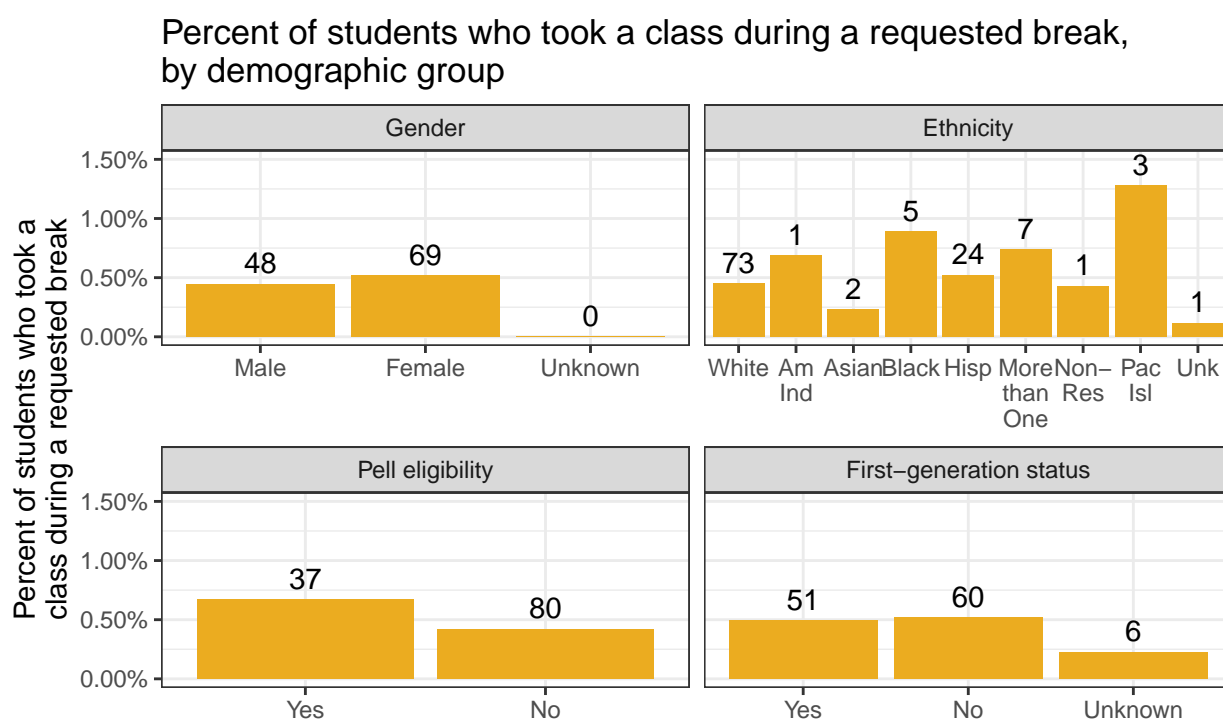

Figure 8: Percent of students who took a class during a requested break, by demographic group. Limited to students who requested at least one break. Labels indicate the number of students who took a class during a requested break.

DegreeWorks

As described above, College Scheduler can pull data from DegreeWorks and allow students to search for classes in their degree plans with a minimum number of clicks. If College Scheduler makes it easier for students to follow their degree plans and thereby leads to more students doing so, then it performs a valuable service. However, since data on whether students actually use this functionality is not available to us, we cannot know whether College Scheduler in fact has this effect.

We *do* have data on students' DegreeWorks plans (though not whether they interacted with those plans in College Scheduler). Therefore, as a crude approximation, we can explore whether students who used College Scheduler were more likely to follow their DegreeWorks plan. As shown in figure 9, this is in fact the case: students who used the tool were far more likely to take at least one class from their DegreeWorks plan. However, we don't know whether using College Scheduler actually *encourages* students to follow their degree plan, or whether students who are more diligent are more likely to use both tools.
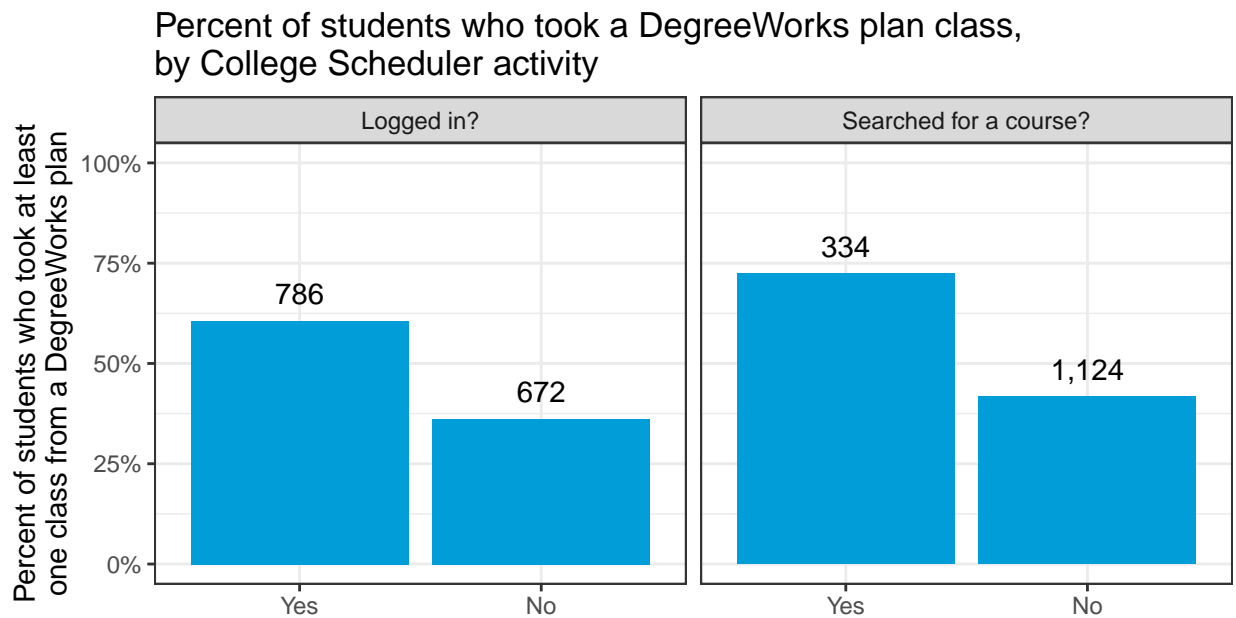

Figure 9: Percent of students who took at least one class from a Degreeworks plan in spring 2021, by College Scheduler activity. Limited to students who had a DegreeWorks plan for spring 2021. Labels indicate the number of students in the group who took at least one class from their DegreeWorks plan.

Advising and orientation

Another question of interest is the circumstances in which students use College Scheduler: do they log in on their own, or do they use it only when prompted by someone such as an advisor or orientation leader?

For advising, as a first approximation, we checked College Scheduler logins against advising data in the data warehouse and found only 4 cases where a student logged in during an advising appointment. Although this finding suggests that most students use College Scheduler on their own, we urge caution: the advising appointments in the data warehouse do not cover all interactions between students and administrators (far from it!), nor would this analysis discover cases where a student used College Scheduler because he or she was previously encouraged to do so by an advisor or other administrator.

For orientation, we checked College Scheduler logins against orientation sessions and found 1,221 cases where a student used College Scheduler on the same day he or she attended an orientation session. As shown in figure 10, only a small proportion of students who attend orientation actually log in to College Scheduler on that day. As with advising, we urge caution: when a student attends orientation and logs in on a subsequent day, we have no way of knowing whether the student did so because of information that was provided during orientation, or whether the student would have logged in anyway.
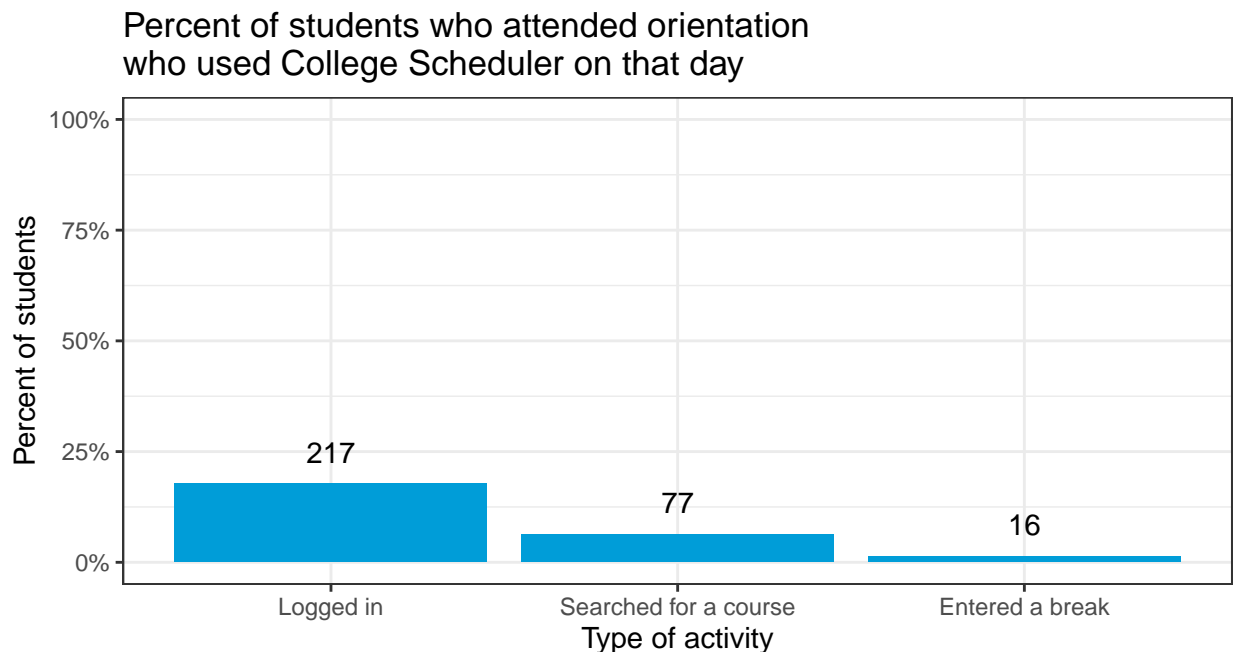

Figure 10: Usage of College Scheduler by students who attended orientation. Labels show the number of students who engaged in each type of activity on their orientation date.

Course demand

MOST POPULAR COURSES

Figure 11 shows the "most popular" courses at SLCC, as measured by the number of students who searched for the course in College Scheduler.
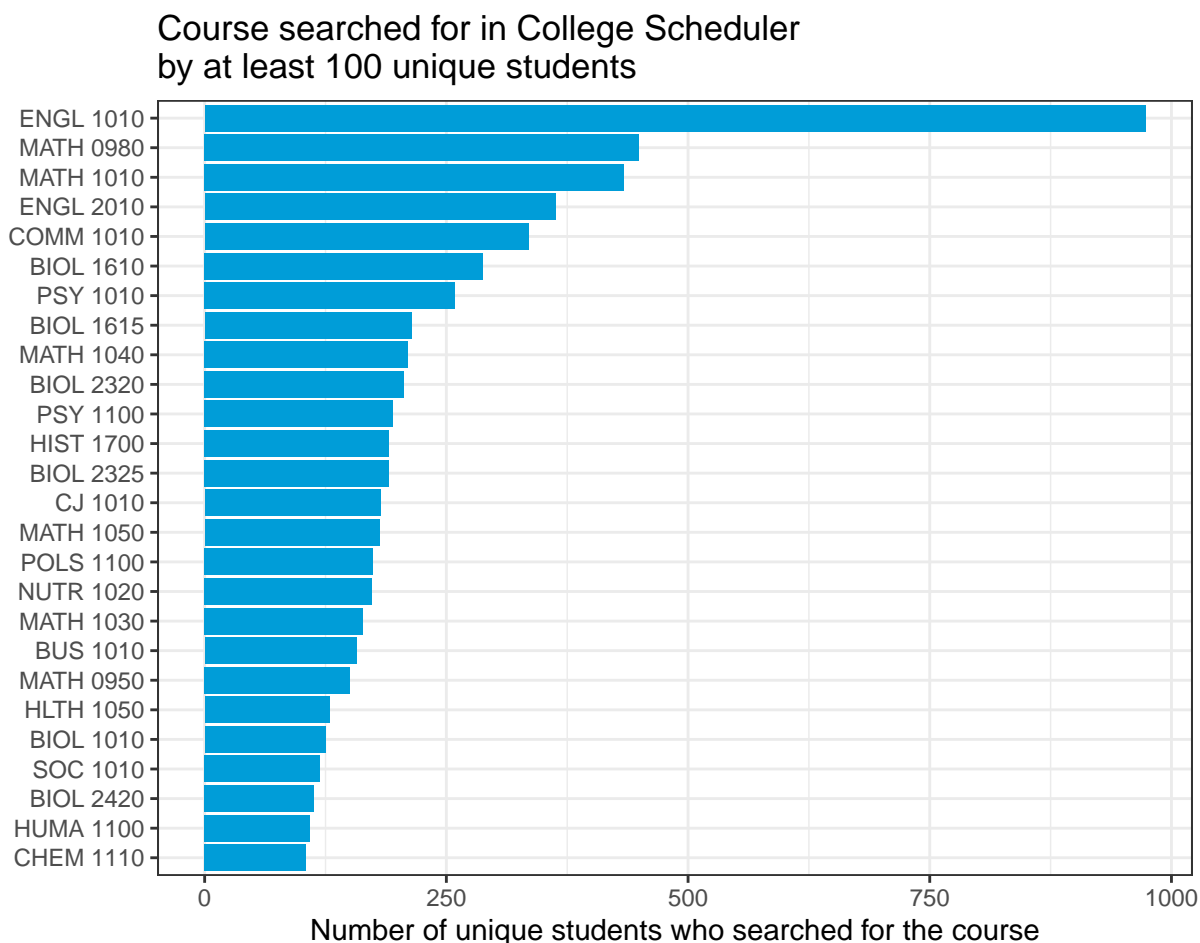

Figure 11: Courses searched for in College Scheduler by at least 100 unique students.

EXCESS DEMAND BY COURSE AND DEMOGRAPHIC GROUP

Unsurprisingly, the courses that students search for most often in College Scheduler tend to be the courses with the highest enrollment. In this sense, then, it's not clear how much this metric is able to tell us that we didn't already know from ordinary course-taking behavior (although certainly there's always the possibility that we might be surprised by what we find).

Perhaps more interesting, and more actionable, is the potential of College Scheduler to flag courses for which the demand exceeds the number of available seats, something that is impossible to see from registrations alone. If a student searched for a course in College Scheduler but didn't take it, that *might* indicate excess demand for a course that existing sections aren't able to accommodate.

(On the other hand, it could also indicate students "browsing" courses that they don't seriously intend to take.) Figure 12 shows, out of the students who searched for each course in College Scheduler, how many students did not actually register for the course.
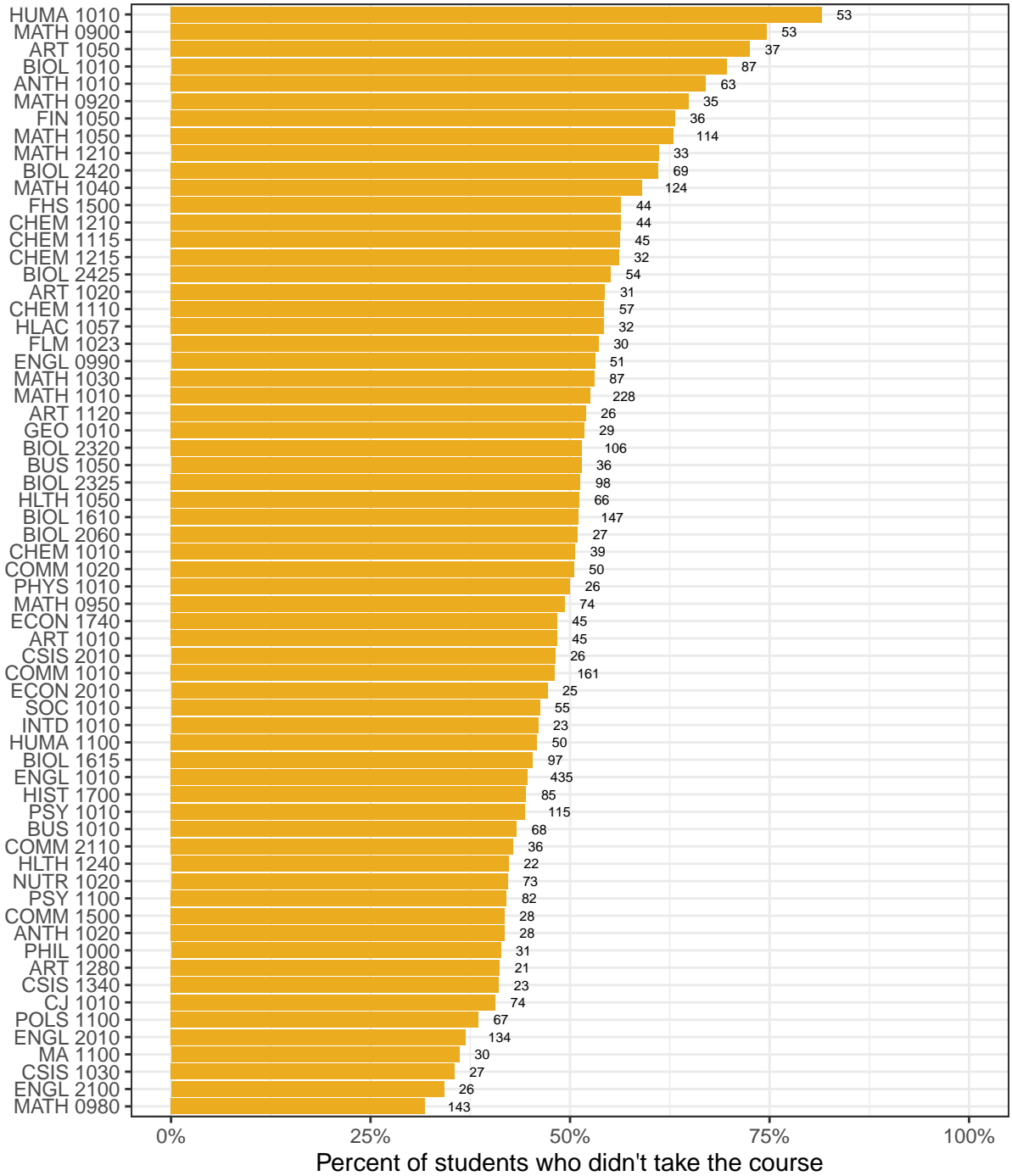

Figure 12: Courses students searched for in College Scheduler but didn't take. Limited to courses that at least 100 unique students searched for in College Scheduler. Labels indicate the number of students who searched for the course but didn't take it.

As with breaks, the data on course searches has the potential to let us explore whether some groups are disproportionately likely to be unable to build the class schedules they need. Figure 13 shows, by demographic group, what percent of students ended up not registering for at least one of the courses they searched for in College Scheduler. In addition to the usual caveats, we urge caution in interpreting this data because of the potential confound of time: students may be more likely to search for a course but not take it if they are signing up later, when more sections are full. If some students are more likely to register late than others, then time of registration may explain any patterns we see.
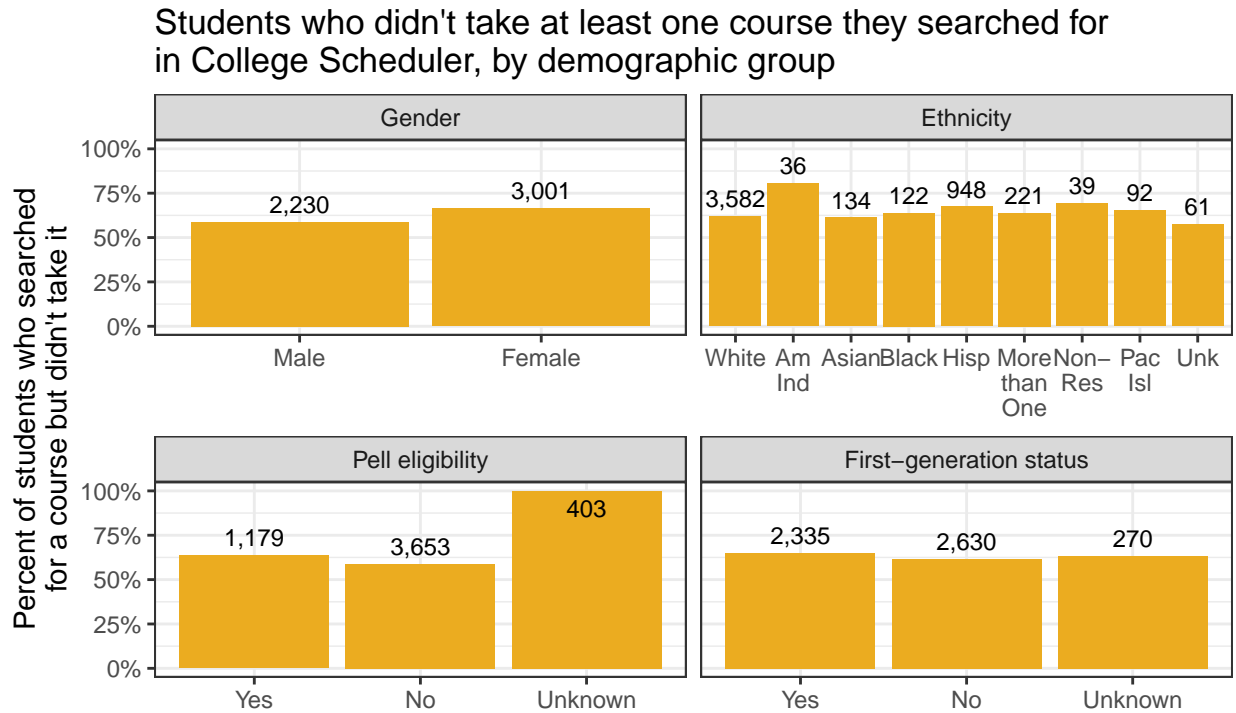

Figure 13: Students who didn't take at least one course they searched for in College Scheduler, by demographic group.

Conclusions and recommendations

College Scheduler has many, though not all, of the desiderata for a scheduling interface. It integrates with Banner and DegreeWorks, and it has a number of useful student-facing features. Although our dataset is currently not sufficient to draw conclusions about the effects of the tool, it is possible in principle that using College Scheduler could encourage students to register for more classes and/or to follow their DegreeWorks plan, especially students who find it burdensome to build a complicated schedule one class at a time. Moreover, we observed that students with lower GPA and fewer credits were more likely to use the tool; we don't know whether the tool concretely helped those students, but this pattern at the very least suggests that it meets a felt need among students who are struggling academically.

The data currently available to us suggests several intriguing possibilities for better understanding students' course scheduling needs. Specifically, we can explore the times at which students prefer to take classes, and possibly identify courses for which there is a sizable unmet demand. We also might be able to identify areas of inequity, if some groups of students are systematically less likely to be able to construct their ideal course schedule.

Moving forward, we recommend the following:

1. **Encourage greater adoption.** The more students who use College Scheduler, the more representative the resulting data will be of the SLCC student body. The fact that new students were particularly likely to use the tool in spring 2021 is an encouraging sign; it's possible that continuing students aren't interested in changing their established registration behavior, but that new students are happy to adopt the tool. Moreover, the link to College Scheduler is now more prominently displayed in the "Registration" tab of mySLCC (see image below); clicking on the large icon takes students to College Scheduler, while the Banner link is less visible.

2. **Explore options for caching historical data.** Some data in the built-in College Scheduler exports (notably breaks) is overwritten as students engage in new activity. Storing historical data in the data warehouse would allow us to distinguish among different terms, and possibly to see how students' interaction with the tool changes during the registration process.