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A Study of Student Perceptions of Office Hours

Lake Ritter
Christina Scherrer
Jennifer Vandenbussche
Jessica Whipple
Kennesaw State University

*Office hours are an essential component of the faculty-student relationship. At present, however, few rigorous studies are available to guide faculty toward best practices in their implementation. In this study, the authors analyze survey results (*n = *169) from a calculus course that included required office hours attendance. Results are presented on student perceptions of office hours' academic usefulness, when and why to use office hours, social ramifications related to office hours, and attributes of those who use office hours. Trends from beginning to end of semester as well as differences in perceptions between heavy and light office hour utilizers are presented.*

Introduction

The practice of holding office hours goes back decades. More than 30 years ago, Chickering and Gamson (1987) cited faculty-student interaction as one of the "seven principles for good practice in undergraduate education" in their landmark report. The highly cited book by Kuh et al. (2011), *Student Success in College: Creating Conditions That Matter*, devotes an entire chapter to student-faculty interaction. More recently, a key national study specific to mathematics found that students' use of office hours was one mark of *Successful Calculus Programs*

(Bressoud, 2015). The importance of faculty-student interaction has only increased as institutions have shifted their attention to improving student retention, progression, and graduation rates. Faculty-student interactions range from brief, informal conversations before or after class or through e-mail to time-intensive guided research experiences. Office hours provide a bridge between these two extremes, creating a space where faculty and students can discuss course content, concerns, study strategies, extensions of topics discussed in class, and more.

Despite the attention given to office hours by institutions and faculty, few students take advantage of them. The annual report of the 2013 National Survey of Student Engagement (NSSE, 2013) indicates that only 22% of first-year students at large institutions reported having course-related discussions "often" or "very often" with faculty members. Moreover, with advances in social media and expanding options for communication, the ways that students interact with faculty are evolving. In this article we are primarily interested in what we would call traditional office hours, those face-to-face encounters, often (but not always) one-on-one in a faculty member's office or other non-classroom environment. Data about these more traditional encounters is limited, but one highly cited student survey (Fusani, 1994) reported that less than half of students indicated having more than two out-of-class conversations with their instructor in a semester. A study of faculty by Nadler and Nadler (2000) found that faculty who responded to a survey averaged fewer than 11 encounters with students outside the classroom per week, despite having an average of 81 students. Of more concern, the authors hypothesized that the responders were likely those faculty most interested in faculty-student interactions, and, thus, they may have more student contact than most.

There is a large body of research studying the importance of student-faculty interactions in a broad sense. However, we currently know little about how students perceive office hours, what role office hours play in students' academic success, or what factors influence their participation in office hours. This article furthers the knowledge in this area by reporting on the study of an academic intervention program including an office hours requirement that we conducted with students in our Calculus I courses during the 2016-2017 academic year. Study results specific to course outcomes and mathematics are available in Vandenbussche et al. (2018). In this article, we address three study questions pertaining to students' perception of traditional office hours. We posed the following questions:

> Q1: How do students entering into an introductory course like Calculus I perceive office hours (their academic usefulness, when and why to use them, social ramifications related to them, and attributes of office hours by students who use them), and how do those perceptions change over the semester?
>
> Q2: What correlation, if any, exists between office hour attendance, both required and elective, and student perceptions of office hours?
>
> Q3: Do demographic factors such as gender or race appear to correlate to the answers to Questions 1 and 2?

Within the literature on the study of contact between students and faculty, a variety of research foci interact with the questions we pose: how students understand opportunities for contact with faculty, student characteristics that influence their contact with faculty, faculty characteristics that impact this contact, and the implications for student learning and outcomes.

Literature Review

Student-faculty interactions outside of the classroom have been studied in a variety of contexts and under various labels, including "out-of-class communication," "faculty-student interaction," and "extra-class communication." The terms are sometimes used differently by researchers, complicating the task of drawing conclusions about the efficacy of any particular type of student-faculty interaction (see Goldman et al., 2016). Despite differences in terminology, the interactions that students have with faculty have been found to impact some key aspects of students' college experiences. These have included increased engagement and sense of belonging (Kim & Lundberg, 2016), motivation to learn (Aylor & Oppliger, 2003), and student retention (Pascarella & Terenzini, 1991; Tinto, 1975).

Understanding students' use (and lack of use) of instructor office hours requires insight into how students perceive them. One study of particular relevance to this study (Griffin et al., 2014) is titled "Starting the Conversation: An Exploratory Study of Factors That Influence Student Office Hour Use." This study includes the results of an online student survey (n = 625) conducted at a large public research university in the United States that attempted to determine what factors influ-

ence student attendance at office hours. Consistent with the previously mentioned study by Nadler and Nadler (2000), Griffin and colleagues found that students take little advantage of office hours. Only one third of the students reported attending office hours at all, and only 8% reported attending more than once. Many factors that the study found to have a statistically significant effect on student behavior fall outside of the control of the instructor—the level of the course, for example, or the course size. However, a few factors cited by students are worthy of faculty consideration. In particular, students were more likely to attend office hours when they agreed that both the times offered and the location were convenient. They were also more likely to use office hours when the instructor's feedback was perceived as useful. Despite finding that freshman- and senior-level courses corresponded to higher levels of student office hour attendance, these authors did not determine a link between class standing and office hour use. This is somewhat surprising; one might expect a student's level of expertise to influence the use of this academic resource.

A few studies in recent years have examined how faculty have attempted to increase students' office hour use. Chung and Hsu (2006), for example, supplemented instructor office hours with a "course center" for a Physics course and a Symbolic Logic course that was similar to a study hall. Students attending the course center could work independently but also request assistance from the instructor or teaching assistants who were present. The authors reported a split opinion between students regarding whether they preferred regular office hours or the course center, but almost 80% of students indicated the presence of the course center made them more likely to seek extra help.

Programs intended to help students develop as self-directed learners have also sought to affect student office hour use. Frank and Scharff (2013), for example, implemented learning contracts with under-performing students in an engineering course. They noted that students who signed the contracts developed a variety of behaviors consistent with academic success, one of which was increased use of instructor office hours. Similarly, McGrath (2014) combined a required office hour visit with a learning reflection exercise to look for improved performance in an introductory statistics course for Psychology majors. She concluded that the combination of planned contact with the instructor and guided self-reflection improved student learning. In a small, more recent study, Joyce (2017) found that when framing office hours as "tutoring" hours, she saw student attendance double

(from 4% of students to 8%). The author reported a different atmosphere during times titled "tutoring hours" when compared to those called "office hours" and speculated that students connect academic purpose to the term "tutoring."

There is often confusion among students regarding how office hours are organized. For example, in responses to an end-of-semester survey (n = 108) on the Physics and Logic course center mentioned above (Chung & Hsu, 2006), students cited not needing an appointment as an advantage to the course center over office hours. This was despite the fact that office hours also had no appointment requirement. Similarly, students cited a preference for the one-on-one help in the course center when the same one-on-one help was available in office hours. A follow-up report on the qualitative data from the Griffin survey discussed above (Smith et al., 2017) indicated that 37% of the participating students believed that office hours are for "emergencies." When asked what would make them more likely to attend office hours, over half of the students expressed a lack of understanding of what office hours are for.

Some studies have indicated that both the frequency and the effect of out-of-class communication (OCC) vary across student demographics. Kim and Sax (2009) provide an excellent discussion of these studies and report the wide-ranging results of their own large-scale study. Across a range of OCC types, from discussions with instructors outside of class to engagement in faculty research, both the frequency of student-faculty interactions and reported satisfaction with such interactions were disaggregated according to gender, race, economic class and first-generation status. They identified some general effects of OCC (for example, engagement in faculty research predicts higher college GPA) as well as patterns associated with student characteristics, perhaps most notably that female, White, upper-class, non-first-generation students report more satisfaction with OCC than their male, non-White, lower-class, first generation colleagues. In a study that looked at faculty-student interactions specifically in STEM disciplines among students classified as belonging to an under-represented minority, Hurtado and colleagues (2011) also report differences in frequency of and satisfaction with OCC based on student race. Across the five institutions they investigated, Black students had less frequent faculty interactions than white students, but attending a large or (especially) an Historically Black institution (HBCU) reduced this difference. They did not see the same difference in OCC frequency between White and Hispanic students.

How faculty characteristics, including perceived physical and social attributes, affect OCC has been the focus of some studies. Not surprisingly, Bippus et al. (2003) suggest that when students perceive faculty as being receptive to communication and capable of providing valuable mentoring, they are more likely to seek out those faculty. In a study of OCC focusing on perceived faculty approachability, Cox et al. (2010) confirm that faculty-student interactions remain infrequent, that part-time faculty experience less OCC than their full-time colleagues, and that faculty behaviors (such as pedagogical differences, tone of voice, and facial cues) can have a small effect on the frequency of OCC. Another small, qualitative study using focus groups found that when faculty engage in interactive pedagogy and invite their students to office hours, students feel more comfortable attending (Cotten & Wilson, 2006).

Some studies paint a different picture, however. In the large-scale study by Griffin et al. (2014) and the follow-up analysis of Smith et al. (2017), results regarding the role of instructor approachability are mixed. Griffin and colleagues found no significant correlation between perceived instructor approachability and student likelihood of attending office hours. As noted by Smith and colleagues, cues to approachability are complex, ranging from subtle behaviors (tone of voice, facial expressions), also described by Cox and colleagues (2010), to deliberate actions faculty take, such as using interactive pedagogies, inviting students to office hours, or (as may happen) actively turning students away. Only a small number of respondents in Smith et al. (2017) cited comfort with the instructor as a significant influence in the decision to use office hours.

What it means to "approach" someone is also changing and has the potential to impact student perceptions and use of OCC. While the use of virtual interactions is not the focus of this study, various authors have reported on the inclusion of electronic modes of communication, most notably instant messaging (IM). Li and Pitts (2009), for example, found that students were not necessarily more inclined to use office hours when given the option to use IM. However, the students in their study did express satisfaction with classes that offered this alternative. Lents and Cifuentes (2010), on the other hand, found that inclusion of an IM option for contact with instructors increased the incidences of student-faculty interaction—both virtual and in-person—at an urban commuter school serving many lower-income, minority students. The Griffin team (2014) was not able to find correlation between the availability and responsiveness of faculty via email to student office hour use. Smith and colleagues (2017) analyzed some student open

responses in the context of emerging communication technologies. While they did not argue for the dismissal of office hours altogether, the authors conclude that the practice of traditional, face-to-face office hours appears dated.

Faculty, students, and administrators are concerned with the potential for OCC, whether traditional or virtual, to impact a variety of student outcomes. As stated, fostering faculty-student interactions has been accepted as a best practice in education for decades (Bressoud 2015; Chickering & Gamson 1987; Kuh et al., 2011). How interactions outside of the classroom play into student learning gains is, at best, unclear. Mayhew et al. (2016) provide a discussion of some of the (at times conflicting) findings. Nevertheless, some scholars note positive effects of OCC on student learning outcomes. Kim and Lundberg (2016), for example, found that student-faculty interactions played a part in cognitive skills development as students progressed through their academic program. A meta-analysis (Goldman et al., 2016) of 14 studies ranging from the late 1970s to 2015 concluded that OCC had a weak to moderate summary effect on both affective and cognitive learning. Admittedly, connections between office hour use and academic success are difficult to explore. In a study of several political science courses (Guerrero & Rod, 2013), office hours attendance is reported to have a limited positive effect on course grades, even when controlling for other factors. In the 2013 Frank and Scharff study, students who participated in the learning contracts and increased their use of office hours showed improvement in their engineering coursework. However, the effects of office hour use could not be distinguished from other potentially beneficial aspects of the learning contracts. McGrath (2014) saw a positive effect on exam performance when an office hour visit was coupled with a learning reflection, but again the effect of the office hour visit cannot be isolated.

If one believes that the positive effects of student-faculty interaction can be achieved through office hours in lower-level courses, then one might wonder about the effects of requiring office hours. A small study (Kaufka, 2010; n= 52) investigated this question in a freshman writing course. Students were required to attend three conferences with the instructor over the course of the semester. Student surveys at the end of the semester indicated that students perceived the conferences as helpful to their learning. Because this was a small study, and, more importantly, because student perceptions of learning are an unreliable indicator of a successful intervention, the question of whether requiring office hours is effective in promoting student learning is far

from settled. This question, along with a desire to contribute to the community's knowledge about student perceptions of office hours, was a primary motivator for the study described in this article.

Methodology

This study was conducted at a large comprehensive university (over 32,000 undergraduate students and 3,000 graduate students) in the Southeastern United States. The average undergraduate age is 23, indicating a significant number of nontraditional students enrolled. Nearly a quarter of the students enrolled in Fall 2016 were part-time students. Approximately 9% identified as Hispanic; 21% as Black, Non-Hispanic; 5% as Asian; and 4% as multi-racial. Approximately one third of new students each year are transfer students. The latest data indicate a 4-year graduation rate of just 13.4% and a 6-year graduation rate of 41.8%. The university has nearly 150 undergraduate, master's, and doctoral programs, including more than 45 programs in STEM fields, such as engineering, computer science, and biology. It is these STEM students who primarily populate the Calculus I course that was the focus of this study. As is often the case, the demographics of the STEM population at this university are quite different from the student population at large; thus, specific demographic data from the study participants are provided in the results.

During Fall 2016 and Spring 2017, the first two authors each taught two sections of Calculus I, for a total of eight sections. Thirty-five to 40 students were enrolled in each section. An office hours requirement was implemented as part of an early incentivized remediation program. During the second week of classes, the students were given a test on prerequisite material that counted for approximately 5% of their grade in the course. Students had an opportunity to retake a test over the same material provided that they met certain remediation criteria; the criteria varied according to their performance on the exam. Students who received less than 25 out of 35 points on the exam were required to complete exam corrections, practice worksheets, and submit a study plan for the semester. In two sections each semester—one per faculty member—the remediation criteria for this low-performing group was supplemented with the requirement that a student attend at least two hours (120 minutes) of office hours. Other students in these sections, as well as all students in the control sections, were invited to office hours but not required to attend. Students had approximately two weeks in which to complete the remediation,

and many extra office hours were provided during this time period. The impacts of the remediation program are described in detail in Vandenbussche et al. (2018). This article combines the control and intervention group and studies the impact of office hour attendance on students in both groups.

Students in all sections took anonymous pre- and post-surveys using an instrument we created (survey instrument is available upon request; please contact Lritter@kennesaw.edu). The pre-and post-survey responses were linked via a code created for each respondent and were administered during the second week of classes and at the end of the semester, respectively. Due to student attrition and errors on the linking code, of the approximately 300 students that enrolled in the eight sections, there were 167 pre- and post-survey responses that could be matched and analyzed. This mixed-methods study reports on student perceptions of office hours based on these 167 responses. For Likert-scale and other quantitative data, we present summary statistics, hypotheses test results, and graphical results, while free response results were coded and then numerically tabulated.

For purposes of analysis, we grouped the Likert-scale statements into four categories that we call *utility*, *logistics*, *social ramification*, and *student characteristics*. (One of the Likert statements was excluded due to a perceived ambiguity in the statement wording.) *Utility* statements refer to the academic usefulness of instructor office hours; *logistics* statements address how, when or why office hours would be used; *social ramification* statements refer to perceived desires or opinions of others as impacted by office hour use; and *student characteristic* statements are related to perceived attributes of students who use office hours.

Comparisons were made between responses from the whole student group on the pre-survey and the post-survey. In order to assess the impact of office hour attendance on student perceptions (research question 2), we also investigated student survey responses for two subgroups within both our control and intervention groups of students: One group, consisting of 91 students, we call "low-OH attenders." This subset of students reported attending office hours at most two times during the term. The second group we call "high-OH attenders." This group of 41 students reported attending office hours six or more times during the term. These definitions were intentionally chosen so that a student who attended office hours no more than two times during the remediation period (and at no time thereafter as reported by the student) would be categorized as a low-OH attender. While means

of the Likert-scale data are presented graphically, hypothesis testing for differences was more robustly completed using the Mann-Whitney test. This was performed using the statistical package Minitab. Throughout the remainder of the article, statistical significance implies a *p*- value of less than 0.05 unless otherwise noted.

The ranking exercise presented respondents with five factors that may influence a student's decision to attend office hours:

- Convenience of the days and times of the posted office hours ("Convenience");
- The approachability of the instructor ("Approach");
- The extent to which the instructor provides useful feedback ("Feedback");
- The availability of extra hours "by appointment" ("Extra hours");
- Proximity to an upcoming event such as an exam or a project due date ("Event").

Students were asked to assign the digits 1 (*most influential*) through 5 (*least influential*) to these factors using each digit exactly once. A few students did not follow the strict ranking directions, and those responses were removed from the analysis, reducing the sample size to 153. The analysis considered the responses as a whole as well as a disaggregation according to the high-OH and low-OH attender groups.

We also report student responses to three open-ended questions:

> Question 1: Please list the activities that you believe instructor's office hours are intended for.
>
> *Question 2: Please list any expectations you believe your instructor has of you when you visit him or her during office hours.*
>
> *Question 3: Please list any expectations you have of your instructor when you visit him or her during office hours.*

To analyze the responses, two of us looked at a small subsample of the surveys and independently developed a list of codes. We compared, discussed, and refined the lists to create a common list of codes. We then independently coded the remaining surveys. We assigned a code to each phrase that appeared in a student response. After completing this process, we compared our coding and found that we

agreed on approximately 85% of the codes assigned. The remaining 15% were resolved through discussion. To help identify patterns, we then organized the codes into categories, and the percentage of students mentioning a phrase (or phrases) coded in each category was calculated.

Results

Self-reported demographics of the 167 students participating in the study are shown in Table 1. The students were fairly evenly split between Fall and Spring classes, early- and late-morning classes, the two instructors, and the office hour requirement policies.

Effects of the Office Hour Requirement

Our results detected no discernable difference in student response to the Likert-scale statements among students in the sections for whom office hours were required for remediation versus those among students for whom they were not. (See Table 2 for a list of questions.) Additionally, there were no statistically significant differences in academic markers such as exam performance or course outcomes between these two groups. See Vandenbussche et al. (2018) for additional details on course outcomes.

Responses to Likert-Scale Statements

Table 2 and Figure 1 show the student responses to the Likert-scale statements assessing student perceptions of the utility (A), logistics (B), social ramifications (C), and student characteristics (D) pertaining to office hours. For completeness, we present both the percentages agreeing (responded *strongly agree* or *agree*) and disagreeing (responded *strongly disagree* or *disagree*) with the 14 statements and the Likert-scale means. Figure 1 also shows which questions had a statistically significant difference in the responses in the pre-survey versus the post-survey, as calculated by a Mann-Whitney test. Table 3 indicates which statements showed a statistically significant difference between the low- and high-OH attending groups on the post-survey.

We also looked for differences in response to the Likert-scale statements between males and females, Caucasian students and African-American or Hispanic students, freshman/sophomores versus juniors/seniors, and STEM majors versus non-STEM majors. We were unable to draw statistically significant conclusions about

Table 1
Demographics of the 167 Students Participating in the Study

Race	*Percentage*
White/Caucasian	56%
Black, African-American	20%
Other or unspecified	19%
Asian, Asian-American	5%
Gender	*Percentage*
Male	77%
Female	22%
Year	*Percentage*
Freshman	53%
Sophomore	33%
Junior	11%
Senior	3%
Major	*Percentage*
STEM field	87%
Non-STEM field	11%
Undeclared	2%
Office Hour Attendance	*Percentage*
Attended no more than two	55%
Attended between three and five	20%
Attended at least six	25%

any of these comparisons, nor did we find any statistically significant changes in pre- and post-survey responses for any of these subgroups that were not also experienced by the whole group.

Table 2

Likert-Survey Responses for Whole Group, High-OH Subgroup, and Low-OH Subgroup

	All Students (n = 167)				*High-OH Attenders (n = 41)*				*Low-OH Attenders (n = 91)*			
	Pre		**Post**		**Pre**		**Post**		**Pre**		**Post**	
Survey Questions	*Agree*	*Disagree*	*Agree*	*Disagree*	*Agree*	*Disagree*	*Agree*	*Disagree*	*Agree*	*Disagree*	*Agree*	*Disagree*
Utility												
A1. Office hours are a useful resource for help with course material.	94.6%	0.0%	94.0%	0.0%	95.1%	0.0%	97.6%	0.0%	94.5%	0.0%	90.1%	0.0%
A2. Office hours are a useful resource for course grade related information.	81.4%	3.0%	91.0%	1.2%	80.5%	2.4%	87.8%	2.4%	81.3%	2.2%	91.2%	1.1%
A3. I can benefit from attending office hours.	94.0%	0.0%	93.4%	0.0%	97.6%	0.0%	97.6%	0.0%	92.3%	0.0%	89.0%	0.0%
A4. Office hours are for students like me.	75.6%	3.7%	73.5%	1.8%	80.0%	0.0%	82.5%	0.0%	70.8%	5.6%	63.7%	3.3%
Logistics												
B1. I know, or can easily find, the dates and times of my instructors' office hours.	92.2%	0.6%	93.9%	0.0%	85.4%	2.4%	97.5%	0.0%	94.4%	0.0%	91.1%	0.0%
B2. Before attending an office hour with an instructor, I should make an appointment.	40.6%	15.2%	24.7%	27.1%	41.5%	17.1%	12.2%	36.6%	40.0%	14.4%	33.3%	22.2%
B3. I should have a specific question ready when I arrive at office hours.	87.4%	3.0%	83.1%	4.2%	80.5%	4.9%	68.3%	7.3%	93.4%	0.0%	90.0%	2.2%

Table 2 (*continued*)

Likert-Survey Responses for Whole Group, High-OH Subgroup, and Low-OH Subgroup

	All Students (n = 167)				*High-OH Attenders (n = 41)*				*Low-OH Attenders (n = 91)*			
	Pre		**Post**		**Pre**		**Post**		**Pre**		**Post**	
Survey Questions	*Agree*	*Disagree*	*Agree*	*Disagree*	*Agree*	*Disagree*	*Agree*	*Disagree*	*Agree*	*Disagree*	*Agree*	*Disagree*
Social Ramifications												
C1. I think that instructors want students to attend their office hours.	83.1%	3.0%	87.9%	1.2%	85.4%	2.4%	87.8%	2.4%	84.4%	2.2%	85.4%	1.1%
C2. The instructor has a low opinion of students that attend office hours.	1.2%	86.1%	2.4%	86.8%	2.5%	77.5%	2.4%	82.9%	1.1%	89.0%	2.2%	86.8%
C3. Attending office hours will give my instructor a good opinion of me.	54.5%	8.4%	47.9%	9.1%	48.8%	12.2%	32.5%	10.0%	57.1%	7.7%	51.1%	8.9%
C4. My classmates have a low opinion of students that attend office hours.	3.6%	67.9%	2.4%	78.0%	5.0%	57.5%	2.5%	77.5%	4.4%	70.0%	2.2%	75.6%
Student Characteristics												
D1. Students who make high grades usually attend office hours.	44.3%	5.4%	40.1%	10.2%	61.0%	2.4%	41.5%	14.6%	41.8%	7.7%	38.5%	8.8%
D2. Office hours are intended for students at risk of making a low or failing grade.	27.3%	43.6%	21.8%	50.9%	15.0%	47.5%	14.6%	63.4%	33.0%	40.7%	22.5%	44.9%
D3. Students who pay attention in class shouldn't need to attend office hours.	4.8%	75.3%	4.2%	75.4%	9.8%	82.9%	2.4%	87.8%	4.4%	72.2%	6.6%	69.2%

Figure 1

Mean Perceptions About Office Hours in the Pre- Versus Post-Surveys

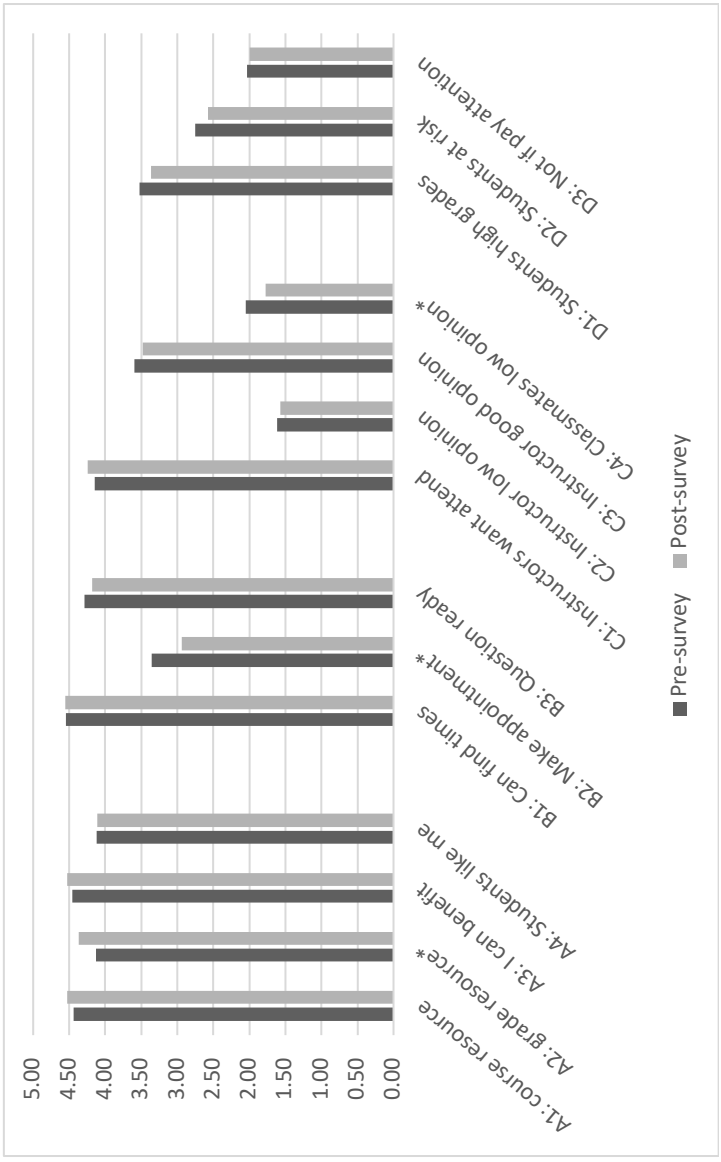


Table 3
Likert-Scale Statements With Statistically Significant Differences in Post-Survey Responses by High- and Low-OH Attenders (*N* = 167)

Survey Questions With Post-Survey Differences Between the High- and Low-OH Attending Groups	*p-Va*lue
A1. Office hours are a useful resource for help with course material.	0.009 (high agree more)
A3. I can benefit from attending office hours.	0.001 (high agree more)
A4. Office hours are for students like me.	0.014 (high agree more)
B2. Before attending an office hour with an instructor, I should make an appointment.	0.004 (low agree more)
B3. I should have a specific question ready when I arrive at office hours*.	0.028 (low agree more)
D2. Office hours are intended for students at risk of making a low or failing grade.	0.006 (low agree more)
D3. Students who pay attention in class shouldn't need to attend office hours.	0.002 (low agree more)

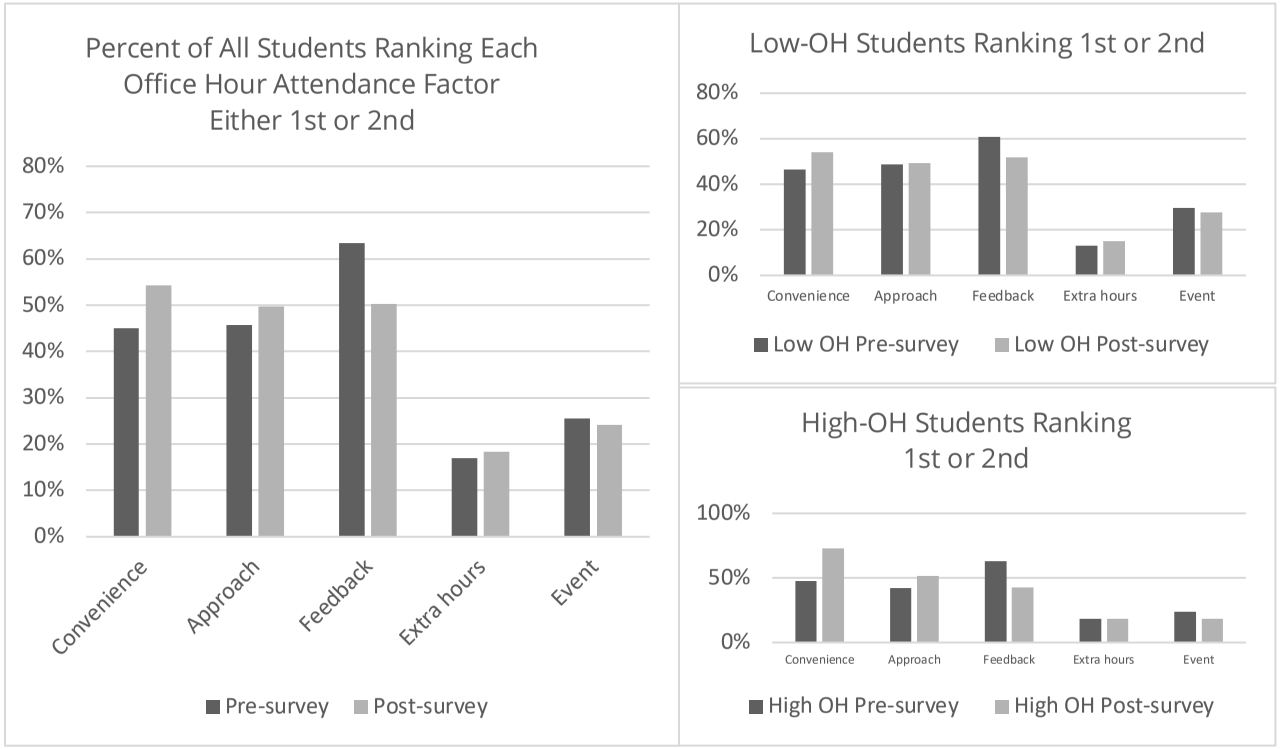
Note. **p*-value was .0004 in presurvey; all other *p*-values >0.05 in presurvey.

Ranking the Importance of Factors in Determining Office Hour Attendance

Both the pre-survey and the post-survey asked students to rank the same aforementioned five factors (*Convenience, Approach, Feedback, Extra Hours,* and *Event*) according to their importance in influencing whether or not they would attend office hours. The frequency with which each item was ranked as first or second in importance, for the entire sample of 153 responses as well as for the two OH attender groups, is shown in Figure 2.

Figure 2

Results of the Ranking Exercise Comparing Pre- and Post-Survey Results for All Students (N = 153), Low-OH Students (N = 91), and High-OH Students (N = 41)



The survey also asked students to list any other significant factors contributing to their office hour attendance. Few students offered any response to this question. Those who did respond cited course difficulty, the availability of other resources, and time (or lack thereof) as significant contributors.

Coded Responses to Open-Ended Questions

Tables 4, 5, and 6 report summarized student responses on the pre-survey to the three previously mentioned open-ended questions. Sample student responses are included with some of the codes to clarify their meaning.

Discussion

In this discussion, we organize student responses to our survey questions according to the four Likert-scale categories from Table 2 (*utility, logistics, social ramifications*, and *student characteristics*) and the factors that influence students' decisions to attend office hours.

Utility

Students do not doubt that instructor office hours are a beneficial resource, as evidenced by the extremely high means and agreement percentages in Table 2 and Figure 1 for questions A1 and A2. Fully 94% of the students surveyed said that they agree (that is, *strongly agree* or *agree*) with the statement, "I can benefit from attending office hours," and the remaining 6% selected "Neutral." When presented with the statement, "Office hours are for students like me," however, the responses were more tempered. Only 74% of students agreed with this latter statement, and 4% actually disagreed. It appears that for some students there is a disconnect between the benefit of office hours in the abstract sense and the way that their use may fit into a student's academic life.

Our findings have implications for programs in which students are compelled to visit with the instructor outside of class (Kaufka, 2010; McGrath, 2014; Vandenbussche et al., 2018). The idea behind these interventions is generally that if we can get students in the door, they will see the utility of office hours and take advantage of them more often. However, student responses to questions A1 through A3 indicate that they do not need to be sold on office hours' utility. Instead, question A4 indicates that knowledge of the benefits may not translate into par-

Table 4

Frequency of Coded Responses to Question 1:
"Please list the activities that you believe instructor's office hours are intended for."

Code Categories	*Codes in the Category*	*Frequency* (n = *154)*	*Sample Student Responses for Select Codes*
Content Questions (94.8% of students)	Specific homework question	2	Going over attempted homework problems
	General homework question	34	To help answer questions on homework/classwork
	Specific non-homework content question	7	Asking specific questions about material
	General non-homework content questions	132	Answering questions about topics not understood
	Review	11	
	Go over exams/quizzes	6	

Table 4 (*continued*)
Frequency of Coded Responses to Question 1:
"Please list the activities that you believe instructor's office hours are intended for."

Code Categories	*Codes in the Category*	*Frequency* (n = *154)*	*Sample Student Responses for Select Codes*
Private Counsel (31.2% of students)	Grade/private discussion	29	To discuss academic standing in their course
	Study guidance	22	Discuss personal strengths/weaknesses and how to correct
	Resolve nonacademic issues	1	
One-on-One Time (7.8% of students)	One-on-one time	12	More personalized 1 on 1 study time
Administrative Issues (5.8% of students)	General course information	4	Asking questions pertaining to procedures in classroom
	Missed class	2	Getting work from an absence
	Retrieving exams	1	
	Make-up test	4	

Issues Outside Scope of Course (5.8% of students)	Extensions	3	Exploring topics outside of course material
	Research opportunities	1	
	Academic advising	5	

Note. Percentages indicate the percentage of respondents to the question mentioning at least one code in that category.

Table 5
Frequency of Coded Responses to Question 2: "Please list any expectations you believe your instructor has of you when you visit him or her during office hours."

Code Categories	*Codes in the Category*	*Frequency (N = 153)*	*Sample Student Responses*
Preparation (86.9% of students)	Question(s) ready	82	Able to articulate what topics you need help on
	Ready to work	53	Do your best to learn
	Did preliminary work	20	To put in the time to work the homework problems
	Tried other resources first	8	Try to ask other resources, such as classmates or other students before coming to office hours
	Have baseline knowledge from class	7	Not expecting to go through the lesson again
	Have relevant questions	15	Discuss only things about the class

Attitude (36.6% of students)	Pleasant demeanor	36	Be patient and respectful
	No excuses/grade manipulation	1	Don't come to get bonus points
	Punctual	7	Going on the assigned time only
	Cooperative	16	Take in advice of instructor
	Honest	2	Be open about my questions or concerns
	Want to succeed	1	
Improve (3.3 % of students)	Student will improve	5	Learn more and understand a concept better
Wait Their Turn (1.3 % of students)	Wait their turn	2	

Table 5 (*continued*)

Frequency of Coded Responses to Question 2: "Please list any expectations you believe your instructor has of you when you visit him or her during office hours."

Code Categories	*Codes in the Category*	*Frequency (*N = *153)*	*Sample Student Responses*
Make an Appointment (1.3 % of students)	Make an appointment	2	

Table 6

Frequency of Coded Responses to Question 3: "Please list any expectations you have of your instructor when you visit him or her during office hours."

Code Categories	*Codes in the Category*	*Frequency (N = 148)*	*Sample Student Responses*
Ability to Help (68.2% of students)	Able to help	98	Clarification and helpful answers
	Able to diagnose problems	1	To see why a student can't solve the problem
	Provide extra resources	2	Give example problems and help work through them
	Succinct	2	Short concise answers
	Explain different ways	2	To provide instruction on a subject in a different way than the subject that was taught in class

Table 6 (*continued*)

Frequency of Coded Responses to Question 3: "Please list any expectations you have of your instructor when you visit him or her during office hours."

Code Categories	*Codes in the Category*	*Frequency (*N = *148)*	*Sample Student Responses*
Willing to Help (53.4% of students)	Willing	26	Help me with as many questions as possible
Availability (25.7 % of students)	There and available	20	I expect him to be there (that has been a problem with other professors)
	Attentive	21	To be focused on assisting students with their concerns or work they have questions about
Demeanor (22.3% of students)	Pleasant/positive	30	To not belittle me
	Professional	1	
	Draws questions out	1	See if there is anything else you can help the student with

Personal Attention (6.1 % of students)	Individual help	3	
	Time to answer all questions	5	
	Able to manage multiple students	1	Not seeing a single student and using the office hours for personal convos while other students are waiting
Counsel (2.0 % of students)	Will discuss course progress	1	To help me better understand how I am doing in the course
	Will give general advice	2	

ticipation. We found no correlation between a student's OH attender group (low versus high) and enrollment in one of our study sections requiring office hours. Twenty-one of the 41 high-OH attenders were from the required office hour sections, with the remaining 20 from the sections where they were not required. This, together with our results indicating that there were no statistically significant differences in course outcomes or student perceptions of office hours between the sections with required office hours versus those without, suggests that obligatory office hour attendance may not be an effective use of faculty time. However, further studies are needed.

Frequent office hour attendance, on the other hand, does seem to impact student perceptions of their utility. There was no statistically significant difference in student responses between the low-OH and the high-OH groups in the pre-survey. After their varying experiences in office hours over the course of the semester, however, students' opinions had diverged. At the end of the semester, the high-OH group had significantly higher agreement with three of the questions related to utility (A1, A3, and A4) than the students in the low-OH group, signaling a stronger belief in the utility of office hours for the former group.

Logistics

The next set of questions (B1 through B3) dealt with the logistics of office hours (see Table 2). Student responses to question B2 indicate significant confusion about the open nature of faculty office hours. In contrast to instructors' general perception that office hours are drop-in by nature, at the beginning of the semester, two fifths of the students in our survey *agreed* or *strongly agreed* with the statement that an appointment was necessary for office hours, even though it was not. Clearly, this confusion is something that we should be discussing deliberately with our students. Fortunately, there was a statistically significant drop in agreement with this statement over the course of the semester. Not surprisingly, the students who frequently attended office hours (all without an appointment) disagreed more with the statement than the low-OH group at the end of the semester. It was surprising, however, that participation in a freshman or transfer student seminar course did not seem to affect this misconception. In the demographic section on the survey, students were asked whether they had participated in such a seminar course in which instructor office hours was addressed; 45% of our respondents answered affirmatively. Contrary to our expectations, when comparing these students with

those who had no such seminar experience, we found no statistically significant difference in their responses to any Likert-scale question, including question B2.

The responses to question B3 ("I should have a specific question ready. . . .") indicate that students are concerned about preparedness when considering office hour attendance. This is strongly supported by the answers we received to the open-ended questions, where 87% of students mentioned preparation (had a question ready, did preliminary work, consulted other resources) as a faculty expectation. When comparing our two OH attender groups, we found a statistically significant difference in their level of agreement with question B3. The low-OH attenders agreed more with this statement on both the pre- and the post-survey, suggesting that this perception, that students must satisfy some preparedness criteria, may serve as a barrier to office hour participation. It can have important consequences for struggling students who have difficulty articulating questions. There is concern in college mathematics education about at-risk students and their participation in optional support resources such as office hours (Twigg, 2013). More broadly, Karabenick and Knapp (1988) found that very low-performing students are unlikely to seek extra help. Finding a way to make struggling students feel welcome to attend office hours should be a priority, particularly early in the semester before they have fallen too far behind.

From the coded open-response questions, we observe that students are aware that office hours are a useful forum to address issues with course content. However, as instructors, we have also had many satisfying and productive conversations with students around advising issues (both academic and career), extensions of course content, study skills, and research possibilities. Students seem less aware of these possible uses of office hours. Helping them to think more broadly about activities for which office hours might be used could encourage positive faculty-student interactions.

Social Ramifications

The responses to the Likert-scale statements pertaining to social facets of office hours (C1 through C3) showed few surprises. More interesting is how students perceive the views of their classmates. The pre-survey responses to question C4 ("My classmates have a low opinion. . . .") suggest that, at least within our department, there is little negative social stigma surrounding the use of instructor office hours. Even so, between the pre- and the post-survey, there was a

10% increase in the number of students who said they *disagree* or *strongly disagree* with this statement. In addition, the subgroup of students who had frequently utilized office hours showed a statistically significant shift toward disagreement. In departments where seeking help is less socially acceptable, requiring office hour attendance could have a positive effect.

Student Characteristics

Student perceptions of the type of student for whom office hours are intended (questions D1 through D3) did not reveal any perceived barriers to participation. The student responses to these questions are somewhat at odds with the results in Smith et al. (2017). Their findings indicated that students often associate office hour attendance with crises. However, only 27% of our respondents *agreed* or *strongly agreed* that office hours are for students "at risk of making a low or failing grade," and fully 43% *disagreed* or *strongly disagreed* with this statement. And while statements referring to grades and class standing arose in our coded data, we did not see the markers of urgency as reported by Smith et al. Of course, experiencing a crisis during a course is not necessarily the same as being at risk of failing, so the comparison is not perfect. Of note is that the high-OH group showed stronger disagreement with this statement in both the pre- and post-survey. Whether questions were sufficiently addressed during class time was cited by students in the Smith study as a factor in whether to attend instructor office hours. However, Griffin et al. (2014) found that the usefulness of in-class discussions and clarity of classroom explanations were not reported with statistical significance as factors in office hour attendance decisions. Our findings are similar to Griffin in that 75% of our students disagreed that paying attention during class should eliminate the need to attend office hours. The level of disagreement for the high-OH attenders was significantly higher than that of the low-OH attenders, particularly on the post-survey.

Factors Influencing Attendance

From the limited list we provided in the ranking exercise as shown in Figure 2, the factors that take priority when students decide whether to attend office hours are clear. Students consistently view convenience, faculty approachability, and quality of feedback as more important than both proximity to an exam and the availability of extra hours by appointment. While there were some changes among the perceived

importance of these influences between the pre- and post-surveys, these three factors clearly remained the most important. Our students echoed the value of instructor approachability as reported in previous studies both in ranking factors and in the coded free responses where it appeared as a quality expected of the instructor. Of note in Figure 2 is that the high-OH attenders placed much greater importance on convenience in the post-survey than in the pre-survey, and less importance on the quality of instructor feedback. We do not know the reason for the shift. Student responses indicate that faculty should carefully consider how they schedule office hours.

We make two additional observations. First, in contrast with our students' perception, it has been our experience (and we expect that of many instructors) that office hour attendance rises sharply in response to an impending exam or other major assessment event. It is notable that students lack awareness about this tendency. Second, the role of instructor approachability remains unsettled. The large study conducted by Griffin et al. (2014) indicated that it is not a statistically significant factor in determining office hour attendance. Our study, along with other smaller-scale (as compared with Griffin) studies (Aylor & Oppliger, 2003; Bippus et al., 2003; Cox et al., 2010), stands in contrast.

Limitations and Future Work

This study suggests two easy ways for faculty to potentially increase student participation in office hours: sharing with students the norm that appointments are not needed for office hour attendance and clarifying the instructor's expectations regarding preparation for office hours. It also suggests that participating in office hours can have a positive effect on how students view office hours. An interesting future study would be to follow students from the high-OH attendance group and see how their future experience as a student differs from the students who do not attend office hours. Interviewing high- and low-OH attenders to get further insight into their motivations could also yield helpful information.

In light of how precious a resource faculty time is, we feel there is an urgent need for additional studies to assess the effect of requiring office hour attendance. Our study provided no results that would support the allocation of faculty time to this effort. In contrast to this, one author experienced a drop in office hour attendance after removing the office hour requirement from the remediation program in Fall

2017. One hypothesis is that just the knowledge that an instructor requires some students to attend office hours is enough to reduce the barrier for all students. Further investigations of required office hours should also study online office hours, because they may more readily fit into faculty and student schedules.

Finally, the applicability of this study is limited in several respects. Because perceptions of office hours should be expected to vary across institution types and courses, our results are not necessarily universal. Also, our sample was not large enough to draw conclusions about race, gender, or other possible demographic influences. In fact, the statistical significance of the results comparing the low-OH attenders with the high-OH attenders is all the more remarkable in light of the sample size. Further investigation across a wider and more varied student sample could yield new insights not uncovered here.

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Dr. **Lake Ritter** *is an Associate Professor of Mathematics at Kennesaw State University. His research interests include differential and integral equations, primarily in applications to mathematical medicine. He is also interested in increasing student access to and success in undergraduate mathematics using open educational resources and active learning pedagogy. Dr.* **Christina Scherrer** *is a Professor and Interim Department Chair of Industrial and Systems Engineering at Kennesaw State University. Her research interests focus on applications of industrial engineering to the public sector, especially economic and optimization modeling for public health. She has also researched widely in STEM education. Dr.* **Jennifer Vandenbussche** *is a Professor of Mathematics at Kennesaw State University. Her primary area of research is in Graph Theory, but she also enjoys contributing to the scholarship of teaching and learning, particularly as it pertains to undergraduate mathematics courses.* **Jessica Whipple** *earned her undergraduate degree in Industrial and Systems Engineering from Kennesaw State University while involved in research and serving in various leadership roles on campus. She is currently an Electrical Distribution System Operator at Georgia Power Company.*