

UNDERGRADUATE PSYCHOLOGY TUTORING ATTENDANCE:  
THE EFFECTS OF REMINDER MESSAGES

by

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## ABSTRACT

This study explored archival data from the Psychology Student Success Center (PSSC) to determine the impact of sending reminder messages to undergraduate students who attended psychology tutoring in an attempt to increase reattendance. The results indicated that the rate of returning for tutoring during the semester when reminder messages were sent out was no different than the return rate in previous spring semesters. This study also looked at student outcomes, in the form of final course grades, for the spring term when reminder messages were sent to determine if there was a significant difference between final course grades of students who attended three or more tutoring sessions and those who had not. No significant differences were found. Finally, the PSSC Session Evaluation Forms were evaluated to determine if students found the reminder messages helpful. On average, students reported that they agreed that the text message reminder encouraged them to return to the PSSC. The only significant difference in the session evaluations between students who returned for subsequent sessions and those who did not was the question asking if students planned to return. Students who return for subsequent sessions were more likely to mark that question as *agree* or *strongly agree* than students who did not return.

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## CHAPTER I

### INTRODUCTION

#### Overview

In their recent review of meta-analytic findings, Schneider & Preckel (2017) reported moderate effects for academic skills training ( $d = .48$ ) and peer assisted learning ( $d = .41$ ) on achievement outcomes. These authors noted even stronger effects for utilizing a strategic approach to learning ( $d = .65$ ). Unfortunately, simply spending time studying had a limited effect on academic achievement ( $d = .32$ ). This suggests that students can benefit from academic tutoring by peers, especially when helped to develop evidenced –based approaches to learning. One of the challenges to offering peer tutoring, however, is student participation. While Schneider and Preckel (2017) reported a moderate effect on academic outcomes for students who engaging in help seeking ( $d = .35$ ) behaviors, voluntary attendance in these types of programs can be low. In the MTSU Psychology Student Success Center (PSSC), not only can attendance be low, but getting students to attend the multiple sessions needed to develop effective learning strategies is often a greater challenge.

#### Compliance

Research has shown that people are more likely to comply if they are reminded of their commitments (e.g. Branson, Clemmey, & Mukherjee, 2013; Farmer, Brook, McSorley, Murphy, & Mohamed, 2014; Hasvold & Wootton, 2011). Additionally, research has shown that people indicate that receiving a reminder message is helpful (Mohammed et al., 2012). Many professions use reminders to increase the likelihood that

people comply with expectations like attending appointments or taking medications.

Today's technology provides numerous options for getting a remind message to clients.

Hasvold and Wootton (2011) conducted a systematic review of the previous research examining the impact of using short message service (SMS) reminders to increase hospital appointment attendance. This review included 29 studies that were published after 2000 and written in English or any Scandinavian language. These studies calculated the impact of the SMS by looking at *did not attend* (DNA) rates. The review found that before the intervention was put in place the median DNA rate of the studies was 23%. After the intervention, the median DNA rate was 13%. In every study but one, the DNA rate decreased. Overall, the researchers found that the SMS reminders help decrease DNA rates.

Farmer and colleagues (2014) extended previous research. Although their goal was to decrease the *did not attend* (DNA) rates for appointments at a sexual health and HIV clinic, they measured cancellations as well. The researchers measured appointment attendance in 2009 and again from May 2012 to April 2013. When they compared the data, there had been a 4% overall decrease in the DNA rate ( $p < 0.005$ ). The researchers attribute this decrease in the DNA rate to the text message reminders. While the reminders succeeded in decreasing the DNA rate, there was a simultaneous increase in the number of canceled appointments during the same time frame from 1,114 in 2009 to 1,274 from May 2012 to April 2013. The data suggests that while the reminders were successful in helping clients remember their appointments, they also prompted the clients to cancel appointments they could not attend. These researchers did not provide data on whether these cancelled appointments were rescheduled. Like in the previous study, the



short message service (SMS) was a popular method of communication according to informal feedback received from the participants.

Mohammed and colleagues (2012) conducted a study to assess the perception of SMS reminders by patients with tuberculosis in Pakistan. Reminder messages were sent to help patients remember to take their medication. This study had 30 participants; the majority (57%) were women, and the rest (43%) were men. The median age of the participants was 25 years old (17-66 years old). The medication reminder messages were sent for 31 days. At the end of the study, participants were asked about their attitudes toward receiving the reminder messages. Ninety percent of the participants said they appreciated the reminder messages. Three participants reported being indifferent toward the reminders because they were already in a routine of taking their medicine, but they did feel that the reminders could have utility for someone not in the habit of taking their medication. Some participants noted that these messages were especially helpful when they were in situations outside of their normal routines. Despite barriers like literacy, phone ownership, and not being familiar with the SMS system, the majority of these messages (1776 over the course of the study) were received by the participants. This study shows overall good attitudes towards receiving the reminder messages, and that the majority of the participants valued the reminder messages.

Branson and colleagues (2013) used reminders to prompt teenage clients to attend their outpatient therapy sessions. Their study examined compliance among 48 teenagers (13-17 years old). Girls made up half the participants, and the other half of the sample was boys. Of these youth, 24 received the reminder messages, and 24 were the control group. The researchers found that the text reminders improved the teenagers' attendance

from 49% to 65% over a 3-month period. Phone call reminders also were used; however, it was discovered that the clients were less likely to answer a phone call and reported that text messages were more convenient for them. Overall, the teenage clients rated the text messages as their preferred method of communication. When asked about the reminder messages in a survey, the teens agreed 100% with the statements, *Reminders helped me remember to go to my appointment*, and *Reminders are a good idea for teenage clients*. These results suggest that using text message reminders is an appropriate way to increase therapy appointment attendance for teenagers. Because many of the students who attend the Psychology Student Success Center (PSSC) are in their late teens, text message reminders could be an effective method of communication.

Summarizing the compliance research, evolving technology has brought about the use of short message service (SMS) reminders, often in the form of text messages. The medical field has been testing the use of such messages as reminders for appointments and taking medication. Studies have shown success in decreasing the *did not attend* (DNA) rates for appointments (Hasvold & Wootton, 2011; Farmer et al., 2014). Branson and colleagues (2013) were able to show an increase in appointment attendance among teenagers when using the SMS. In order to maximize to potential benefits of the PSSC, students need to attend multiple sessions. Reminding the students of their commitments to return could increase compliance, which in turn could increase the effectiveness of the PSSC. SMS reminders were used because research has shown positive attitudes toward this type of reminder (Mohammed et al., 2012) especially among teenagers. The PSSC used SMS reminders to try to increase attendance because the messages have had success in other studies, and people have reported appreciating this form of reminder.

## Learning Strategies

Learning strategies refer to the techniques people use to study and process material. Research has been conducted looking at what study methods are best linked to positive outcomes like increased scores or longer retention (e.g, Bartoszewski & Gurung, 2015; Dunlosky, Rawson, Marsh, Nathan, & Willingham, 2013; Lopez, Nandagopal, Shavelson, Szu, & Penn, 2013; Lynch, 2006; Schneider & Preckel, 2017) Results from these studies have found that some strategies are more effective than others. For example, Lynch (2006) found that freshmen were more likely to continue to utilize the same study methods they had used in high school. Specifically, they were more likely to use passive learning techniques that did not promote deeper level processing. Passive study methods are things like highlighting, underlining, and rereading. In their meta-analysis of the variables associated with achievement in higher education, Schneider & Preckel (2017) noted that these types of shallow information processing techniques had a moderate, negative relation with achievement ( $d = -0.39$ ).

These results highlight the importance of teaching effective learning strategies in freshmen classes. Since PSY 1410 is an introductory class, it has a large number of freshmen. To help them learn evidenced-based study techniques, their textbook has a chapter specifically about study skills (Schacter, Gilbert, Wegner, & Nock, 2015). The peer-tutors in the PSSC promote using these same strategies. The goal in teaching these strategies is to help the students study more effectively and efficiently by not wasting time using ineffective techniques. The peer-tutors focus on teaching the following five evidenced-based learning strategies: (a) distributed practice; (b) practice testing; (c) elaborative interrogation; (d) self-explanation; and (e) interleaved practice.

**Distributed practice.** Distributed practice refers to students spacing out their studying over a longer period of time as opposed to mass practiced (i.e. cramming). Instead of cramming a lot of studying into one session, they would study more frequently for a shorter amount of time (Dunlosky et al., 2013). In their meta-analysis, Dunlosky and colleagues (2013) found that spacing practice out over time was better than massed practice that takes place in a single day. Specifically, they reported an overall increase in the amount of information recalled from 37% after massed study to 47% after spaced studying. Distributed practice has been shown to be effective for several different topics including definitions and remembering parts of lectures. Dunlosky and colleagues (2013) rated distributed practice as having high utility as a learning strategy.

There are several underlying reasons why distributed practice may be effective. For example, it complements the process of how memories are created and stored (Schacter et al., 2015). Once information like psychology concepts are taken in and encoded, the information is temporarily stored in the short-term memory. Like the name implies, this type of memory does not last long if nothing else is done with it. Activities like thinking about what happened in class, talking it over with others, and working on other activities related to the concepts will help the memories become consolidated. This helps memories become more established and move from the short-term to long-term storage. With each subsequent session of studying, the student is able to strengthen the connections to that material (Dunlosky et al., 2013). This could make the material easier to retrieve out of memory on an exam.

A study by Blaisman (2016) looked at final exam scores of four introductory psychology classes after receiving an intervention. In the study, she gave two classes

concept review materials in a distributed fashion while two classes did not receive the materials. The researcher found that the experimental group in the study that used distributed practice reviews had a final exam score that was 8% higher than the control group. Additionally, the more times the student reviewed a concept, the more likely the student was to get the question about it correct on the exam. The author did note that the overall difference between her experimental and control group was smaller than most of the studies in her literature review.

Additionally, a study looking at undergraduate performance related to the number of times they had visited the tutoring center found that students who came several times were more likely to be in good academic standing than those who came few or no times (Cooper, 2010).

The format of the PSSC encourages students to use distributed practice. The first time they come in, students are asked how they usually study. If massed practice seems to be one of their methods, they are told about the benefits of distributed practice and how it can work with their schedule. Students who come not only get help while they are at the center, but the peer assistant also helps work out a plan of what the student will work on before they come back. Having the students plan what needs to be done before returning also encourages them to pick up their class materials again between visits. Using this effective learning strategy could lead to better performance on exams.

**Practice testing.** This study technique involves students making up or using existing questions about the content to see how well they understand the material (Dunlosky et al., 2013). Dunlosky and colleagues (2013) rated practice testing as being a high utility learning strategy. The study technique chapter in the students' textbook

provides lots of ideas on how to effectively use practice testing (Schacter et al., 2015). Examples of self-testing techniques would include things like using tools provided from the professor or text author. This might include specific learning objectives for each chapter. Many texts have questions at the beginning and end of the chapters to check comprehension as the students are reading. The student can take these learning objectives and chapter questions and turn them into multiple choice or open-ended questions. The students could also create their own tests by using the notes they took in class. They could take some of those notes and turn them into questions about the material to check their understanding. As they use the practice tests, they should be sure to mix up the order of the questions and study in a variety of locations. Another potential way to use practice testing is to pretend you are teaching the material to someone else. This could help the students focus on the deeper meaning of the material and how it connects to what they have already studied. The concepts that students have trouble explaining are the ones they should probably spend more time studying. Finally, the last tip for self-testing is to start early. Practice testing creates a challenge for your brain, which makes you more likely to retain the material longer (Schacter et al., 2015).

One problem many students experience is being overconfident about their knowledge of the material (Rawson & Dunlosky, 2012). Sometimes using the less effective study strategies like rereading, highlighting, or looking over notes could lead to familiarity with the material. This is dangerous because the students will feel like they know more than they do and be less motivated to study. Practice testing helps alleviate this problem by providing the students an accurate picture of where they are. The students see how many questions they can actually answer instead of simply how much

information they recognize. The meta-analysis by Dunlosky and colleagues (2013) suggests that practice testing could help improve students' mental organization of the material, allowing them to access it more readily. They also suggest that the practice test could cause the student to pull the information from their long-term memory, activating related information as it happens. This could help strengthen the neural connection and help the student see how it related to different parts of the material.

Bartoszewski and Gurung (2015) conducted a study exploring the use of 10 different learning strategies among college students in two introductory classes. They then checked to see how each of these 10 study strategies was correlated with the exam scores. The majority of participants self-identified as first year students. The students were asked to rate on a Likert scale how much they used the different study techniques. The researchers then examined how these reports related to exam scores. Several of the study strategies were significantly related to exam scores; practice testing was found to be the study technique that was most consistently related to exam scores. This study also found that the use of one study strategy was closely related to the use of others. It seemed to suggest that if students were using one good study technique, they probably also used a few others.

Visiting the PSSC could help PSY 1410 students become aware of all the premade resources available that would allow them to engage in practice testing. Students are often unaware of all the materials they can access. The course textbook comes with questions at the end of each section and chapter to help students test their comprehension as they read. The textbook also contains handouts for each chapter that can serve as reading guides and give more practice for difficult concepts. Along with the physical

book, there is also an online resource, LaunchPad, provided by the textbook publisher. Launchpad contains further opportunities for practice testing like chapter practice quizzes, key term matching activities, LearningCurve which gives students several questions about each chapter section then shows them what percentage of each part of the section they answered correctly, and interactive videos about tricky concepts with questions at the end. The peer-tutors in the PSSC also teach students how to make their own questions if pre-made ones are unavailable. Students learn they can turn the section headings into questions. They are also taught to ask more open-ended questions to see the depth and breadth of their knowledge. Finally, the peer assistants show students where the key term lists are at the end of each chapter and encourage them to use these lists as quizzes. The tutors in the PSSC attempt to increase the PSY 1410 students' use of these resources by teaching them the importance of practice testing. Using more challenging study techniques like practice testing could lead to the students better understanding the course information. This could eventually lead to better outcomes in the course.

**Elaborative interrogation.** This learning strategy involves the student going beyond simply memorizing facts (Dunlosky et al., 2013). One way to do elaborative interrogation would be for a student to explain a concept in their own words. The student could then ask themselves questions about the concept and answer those questions by elaborating and linking that concept to what he or she already knows. In their meta-analysis, Dunlosky and colleagues (2013) found that this strategy tends to work well for several different kinds of learners, including upper elementary, high school, and undergraduate students. It also has utility for students with learning disabilities and minor cognitive problems. These researchers also make the point that the effectiveness of this



strategy is partially dependent on the student's previous level of knowledge. Taking all this into account, the researchers rated this learning strategy as having moderate utility.

Elaborative interrogation works because it helps integrate the new information with existing information the student already learned (Dunlosky et al., 2013)). This helps organize the information in a way it is easier to recall. This learning strategy also promotes looking at concepts in the light of similarities and differences related to information the student has already learned. This could lead to a deeper understanding of the concepts. For example, students might be less likely to be confused by similarly sounding concepts if they have thought about ways those concepts are different. Finally, explanations generated by the student are more likely to be remembered than those that are simply provided to the student. People are more likely to remember things they come up with themselves.

Lopez and colleagues (2013) looked at the study habits for students enrolled in a college organic chemistry class. Participants were recruited at the first lecture. Eighty-nine students agreed to participate. The sample was ethnically diverse. Forty-one of the students self-identified as Asian, 31 self-identified as White, and 17 self-identified as Latino. Data was gathered from multiple sources like the students' study diaries, concept maps they had made, problem sets, and the students' final course grades. The student results showed that students mostly used review-type strategies. The researchers also talked about how few students engaged in study strategies that would lead to a deeper understanding or highlight how well the student knows the material. They also found a lack of relationship between the study strategies students were using and all of the outcome measures. They suggested this could mean the strategies that were used most

often were not useful. Elaborative interrogation would allow students to build on those basic reviewing techniques and incorporate student's prior knowledge and elaboration.

Sometimes students need to see models of how to engage in a learning strategy instead of just hearing about it. At the PSSC, peer assistants show students what types of questions are good to ask yourself and where examples can be found. The worksheets in the back of the PSY 1410 textbook and questions at the end of each chapter provide an opportunity for students to ask and answer questions about the presented information. By seeing those examples, the students have a good place to start and can elaborate further from there. The concept practices in the online textbook resource help the students see how the current concept links to previous concepts that have already been studied. Peer assistants help by filling in some of the gaps about how concepts are related within and between chapters. By using these resources provided to engage in elaborative interrogation, students could understand the course material at a deeper level, possibly resulting in a higher exam score.

**Self-explanation.** Self-explanation happens when the student explains a concept in his or her own words (Dunlosky et al., 2013). It also could include the student linking examples in his or her own life to the current material. Self-explanation takes studying beyond simply reviewing the material. This learning strategy encourages deeper understanding by having the student create explanations that are meaningful to them and that they understand. Another way to use self-explanation would be working backwards. The student would first choose an answer on a practice test, and then the student would go through and explain in his or her own words why that answer is correct. Dunlosky and colleagues (2013) gave this learning strategy a rating of moderate utility. Their meta-

analysis also revealed self-explanation works well for a wide age range of people, including undergraduate students. The effectiveness of this strategy is supported by the research by Lopez and colleagues (2013), who found that students needed to use study strategies that go beyond just reviewing to see positive effects.

Self-explanation works a bit like elaborative interrogation (Dunlosky et al., 2013). Explaining concepts in their own words encourages students to integrate this new information with what they already know about that topic or similar topics. The researchers do note that the prompts needed to elicit self-explanation can be more varied than those needed for elaborative interrogation. Very broad prompts could be used to help students consider their understandings of concepts.

When students come to the PSSC, peer assistants show them how to explain concepts in their own words and what questions they should be asking themselves to get the most out of studying. Teaching students how to use self-explanation could look a few different ways. Some students may be asked to explaining concepts in their own words while other students may be asked to provide an example of a definition provided in the textbook. Teaching students to paraphrase by cutting out extra words and keep the parts that are most meaningful is a good place to start when helping them to learn how to use self-explanation. Another technique is actually teaching students to ask themselves questions that will lead to self-explanation. During tutoring sessions, students become comfortable with questioning their understanding. A final thing to consider from the meta-analysis by Dunlosky and colleagues (2013) is that going through and asking a few questions about each concept is time consuming. Students may be discouraged when first using this learning strategy because of the amount of time it initially takes to generate

explanations in their own words. This strategy could reduce time spent studying later because students are more likely to remember their own definitions and explanations. Peer assistants in the PSSC explain to students some of the possible stumbling blocks in the beginning, but they also emphasize the positive effects that could result from engaging in this technique. Using self-explanation could increase PSY 1410 students' understanding of the material.

**Interleaved practice.** This learning strategy takes place when a student switches between different subjects when studying instead of studying the same subject during one large block of time (Dunlosky et al, 2013). Dunlosky and colleagues (2013) found in their meta-analysis that students were more accurate in answering practice problems when using interleaved practice instead of a large block of studying after a day's time. While block studying produced a higher rate of student accuracy when they were tested right after, interleaved practice had huge benefits when the time between the studying and test was delayed. The studies showed that using interleaved practice as opposed to block studying increased the students' accuracy on a criterion test by 43% when there was a delay between studying and taking the test. Since college courses require students to remember information for longer than a day, utilizing interleaved practice could result in greater retention than studying the same information in one large block of time. This learning strategy was found to be applicable to a wide variety of topics, from identifying paintings to grammar rules (Dunlosky, et al., 2013). Interleaved practice has been shown effective for college age students, but it also works well for school-age children. Dunlosky and colleagues (2013) ranked this learning strategy as having moderate utility.

This learning strategy is effective because it helps promote mental organization of material (Dunlosky et al. 2013). Breaking up studying gives time for the information to leave the working memory. When the student comes back to continue studying, they have to retrieve the information again. This can strengthen neural pathways and make later retrieval easier. If the student studies a different subject during the break, they may also be able to make connects between the two topics. That could lead to better integration .

Some students may have the tendency to try cramming all the information the night before an exam. While they will be able to recall most of the information at the end of studying, this familiarity can lead to inflated confidence in how well they know the material. Once they experience a time delay however, they lose much of the information. Students who have studied in one large block may not know that they are missing some of the information until the test. By taking breaks while they study, they will be able to see what information has been lost. They still have a chance to go back and study that information. This can lead to the students having a more accurate idea of how well they know they information. Teaching the students at the PSSC this study skill could prevent them getting to the exam and just then realizing what information they do not remember.

### **Purpose of the Study**

Previous studies have shown that students find peer-assisted tutoring helpful (Alkhail, 2015; Hammond, Bithell, Jones, & Bidgood, 2010). They also have shown that tutoring has larger positive effects the more students attend (Cooper, 2010; Munley, Garvey, & McConnell, 2010). However, these beneficial effects can only occur if students use these services and attend multiple sessions. The purpose of the current study was to examine whether sending reminder messages to students after their first tutoring session

would increase the number of subsequent sessions they attended. The spring 2018 semester was the target of this study because the percentage of students who came back to the PSSC was lower during the spring 2017 semester, compared to the fall 2016 semester. During the spring 2017 semester, only 33% of the students who attended one session came back for additional sessions. It had been previously observed that compared to those taking PSY 1410 in the fall term, more students enrolled in spring terms had previously attempted PSY 1410, with a grade of D, W, or F. It was hypothesized that the use of reminder messages would increase the percentage of students who returned for additional tutoring sessions.

### **Hypotheses**

The current study had the following three hypotheses:

**Hypothesis 1:** Compared to spring 2016 and 2017 when text message reminders were not in use, students in Spring 2018 who received the reminder messages would be more likely to return to the PSSC for multiple sessions. Specifically, a time series analysis was used to determine if more student in spring 2018 returned for multiple tutoring sessions compared to spring 2016 and 2017.

**Hypothesis 2:** Students who attended three or more tutoring sessions in spring 2018 would have a lower percentage of DWFs (drop/withdraw/fail) than the students who attended only one or two sessions.

**Hypothesis 3:** In spring 2018, students would report on the PSSC session evaluation that they found the reminder messages helpful.

## CHAPTER II

### METHOD

#### Participants

Participants in the current study were students who utilized the Psychology Student Success Center (PSSC) for psychology tutoring for the Introductory Psychology classes (PSY 1410) during the spring semesters 2016-2018. The data was archival and came from existing data available in the PSSC. Students attended tutoring in the PSSC on a voluntary basis. The PSSC is located in a room in the Psychology Department building. It was staffed 10 hrs. per week across 5 days, in 2 hr. shifts, totaling about 150 hours a semester, with trained undergraduate peer assistants or a graduate assistant supervisor. To control for the impact that specific faculty members may have on student participation in the PSSC, the same faculty members across five sections were evaluated over 3 consecutive years, spring 2016 to spring 2018. During the spring 2016 semester, 10 students attended a total of 19 tutoring sessions. In the spring of 2017, 28 students attended a total of 51 tutoring sessions. For the spring 2018 semester, 15 students attended a total of 41 tutoring sessions.

A total of 1376 students took PSY 1410 during those semesters. The demographics for the students in each year, spring 2016 ( $n = 468$ ), spring 2017 ( $n = 459$ ), and spring 2018 ( $n = 449$ ), were all very similar (see Table 1). The majority of the students were female (61%). They tended to have a low number of credit hours with 61% being freshmen and 26% being sophomores. The average age of these students when they took this class was 21. The majority of the students taking this class were white (52%). African American students comprised approximately one-third of the students (32%).

Table 1

*Demographic Information for General Psychology by Section and Year*

	% Gender		% Race			% Class			% First Generation		<i>M</i> ACT Reading
	<u>M</u> <sup>a</sup>	<u>F</u> <sup>b</sup>	<u>B</u> <sup>c</sup>	<u>W</u> <sup>d</sup>	<u>O</u> <sup>e</sup>	<u>F</u> <sup>f</sup>	<u>S</u> <sup>g</sup>	<u>O</u> <sup>h</sup>	<u>Y</u>	<u>N</u>	
	Section 1										
2016	40	60	36	50	15	56	30	13	43	57	21
2017	37	63	35	45	20	64	24	12	47	53	21
2018	39	61	29	53	18	53	33	14	39	61	22
Section 2											
2016	39	61	37	53	11	68	18	15	47	53	22
2017	36	64	34	49	16	62	25	14	45	55	22
2018	37	64	23	54	23	60	22	19	37	64	23
Section 3											
2016	49	51	22	60	18	57	32	11	44	56	21
2017	42	58	28	51	21	61	32	7	34	66	22
2018	46	54	24	54	22	56	25	19	35	65	23
Section 4											
2016	45	55	32	54	14	64	21	15	41	59	22
2017	34	66	45	43	12	47	35	18	42	58	22
2018	23	77	38	51	11	62	28	10	41	60	22
Section 5											
2016	44	56	36	51	13	67	19	14	30	70	22
2017	43	58	25	63	12	75	12	12	51	49	23
2018	37	63	34	50	16	66	16	18	32	68	23

*Note:* <sup>a</sup> male, <sup>b</sup> female, <sup>c</sup> black, <sup>d</sup> white, <sup>e</sup> other, <sup>f</sup> freshman, <sup>g</sup> sophomore, <sup>h</sup> other



Most of the students were not first generation (59%), meaning at least one of the student's parents had attended college. These students had an average Reading ACT score of 22, which is the score considered to represent college readiness in the area of reading for the social sciences (College and Career Readiness Benchmarks, 2018). The average grade received in this class was 2.51, which is considered a C. After this course was completed, the average grade point average (GPA) of these students was 2.7, which represents an average course grade of a C+.

### **Measures**

Currently, the University tracks all undergraduate students participating in tutoring on campus. Data regarding students accessing tutoring and its effectiveness across campus is stored in the Argos system. Additionally, the PSSC collects information specific to tutoring for PSY 1410.

#### **Attendance.**

***Swipe-in computer program.*** The University has a required electronic tracking system that is utilized for all undergraduate tutoring services on campus. This system automatically collects data about the students who utilize tutoring, including the following: (a) first and last name; (b) student university identification number; (c) date and duration of time the student spent in the tutoring session; (d) the PSY 1410 professor the student has for class; (f) the section of PSY 1410 he/she is in.

***Sign-in sheet:*** When each student entered the PSSC, he or she was asked to report sign-in on a sheet. The sign-in sheet collected the following information: (a) first and last name; (b) student university identification number; (c) date and time the student came in; (d) time the student left the tutoring session; (e) the PSY 1410 professor; and (f) what

section of the Introductory Psychology class the student was enrolled in. This paper is used as a backup to check and verify the swipe-in system.

**Demographic information.** The Argos system also collects other information about undergrads attending academic tutoring on campus. In the current study, the following data from Argos was utilized: (a) ACT Reading score; (b) final course grade; (c) number of credit hours earned; (d) gender; (e) ethnicity; (f) class rank (F, S, J, S); (i) first generation status; and (j) overall GPA for the term they took PSY 1410. These demographics will be used to determine how the students who utilize the PSSC compare to all the students enrolled in PSY 1410.

**PSSC session evaluation form.** At the end of each tutoring session in the PSSC, students complete a session evaluation form about their perceptions of the tutoring session (see Appendix A). Questions about what students thought was helpful, what they learned, and if they planned to come back were asked. There were 12 questions on the evaluation form. These questions were answered on a 5-point Likert scale from *Strongly Disagree* to *Strongly Agree*. Question six was a control question asking the student to choose choice *Disagree*. This control question let the researchers know if the student was reading the questions or just circling answers. The last question asked the student if the reminder message encouraged him or her to return to tutoring. The tutee included his or her student identification number, date of the tutoring session, and name of the peer assistant at the top of the evaluation form. The tutor then placed the evaluation in a specified folder in the filing cabinet to be sorted by the graduate assistant.

**Intervention**

Students receive individualized tutoring that caters to their reason for attendance. With the help of peer tutors, different tools and resources were utilized to ensure that students were equipped to succeed in their class.

**Tutoring.** The PSSC uses the peer-assisted learning (PAL) approach to tutoring. Tutors were upper level (junior or senior) psychology students who have successfully completed the PSY 1410 class. Tutoring sessions varied from student to student, but typically included gathering information about previous studying, teaching learning techniques, answering student questions, and showing them how to navigate and utilize the online textbook resources. Adjustments to the session were made as necessary to ensure students' needs were being met.

**Learning techniques.** The PSSC promotes five learning techniques that are shown to be effective ways to study. Tutors found out how the students were currently studying. They then realign the students' methods with the best practices, if necessary. The five learning techniques recommended by the PSSC are (a) distributed practice, (b) practice testing, (c) elaboration strategies, (d) self-explanation, and (e) interleaved practice. These techniques help the students remember what they have studied.

**LaunchPad.** The textbook used for the PSY 1410 class comes with an access code that allows the students to sign up and access additional resources. The website contains concept maps, flashcards, video activities, and practice quizzes. There are customized resources for each chapter of the book. These resources align with several of the learning techniques and give the students new ways to work with the information.

**Textbook.** The textbook itself contains various resources that are helpful for the students. The tutors made sure the students were aware of the tools the book contains that could be helpful when they were studying. There are short quizzes at the end of each section, so the students can check their reading as they go along. Key term lists at the end of the chapter can be useful review tools. Finally, there are various worksheets in the back of the book that correspond with key concepts.

**Remind messages.** Starting in spring 2018, the PSSC sent out text messages, prompting students to return to tutoring. This was done using an app called Remind to send out these messages from the PSSC account. At the end of each session, students were asked to provide a date they planned to return to the PSSC for another session. Students were asked to provide a phone number and to consent to receiving the reminder messages. In order to receive the reminder message, students had to opt-in. The reminder messages contained the date the student said he or she would be returning and the hours the PSSC would be open that day. The messages were sent out 2 days before the scheduled session date, as suggested in the study by Farmer and colleagues (2014), to provide sufficient time for arrangements to be made for attendance. The goal of this reminder was to increase the tutoring re-attendance rate. Records were kept of which students received reminder messages and whether or not they returned for subsequent sessions.

### **Procedure**

During the spring semester of 2018, tutoring procedures remained the same as in previous semesters. Students continued to swipe-in for the University's records and sign-

in as a backup. Tutoring sessions were conducted using the same format as outlined in the session form (Appendix B). Data reports continued to be run and analyzed.

**Remind messages.** Beginning in spring 2018, on the PSSC session form, students were asked to provide the PSSC with a phone number where they could receive text messages if they would like reminders about upcoming appointments. This form was completed at the end of each tutoring session. The student completed the session form with the tutor. That form had a space for the student to write in the next date he or she planned to come back to tutoring. At the end of the PSSC hours on Monday through Thursday, the graduate assistant went to the tutoring center and compiled a list of students who had provided a date they plan to return, a phone number, and consented to receive messages. On Fridays, the peer tutor working in the center compiled the list and emailed it to the GA. The GA then put all the information into the Remind system and scheduled when the messages would go out. The Remind system then sent out the messages to the students in accordance with the schedule the GA has specified for it, usually 2 days before the date the student plans to return. The reminder message format was as follows, “This is a reminder that you signed up to come back to the PSSC on (date). On (day of the week), we will be open from (opening time to closing time). Thanks!” The hours for the day the student plans to return were included to assist with planning.

**Short notice.** Messages were sent to the students 2 days before their scheduled session if possible. This would not be possible if a student planned on coming back to the PSSC the next day. In that case, the message was sent out the day the student was

scheduled to attend. Students who did not receive the 2 two-day notice were noted in the spreadsheets.

*No phone number provided.* Students who did not provide the PSSC with a phone number that could receive text messages were not contacted to remind them of their next session. This lack of a remind message was noted on the spreadsheet.

IRB approval to analyze archival data collected for the PSSC from Spring 2016 through Spring 2018 was obtained (see Appendix C).

## CHAPTER III

### RESULTS

During the spring 2018 semester, 15 students attended a total of 41 tutoring sessions. The majority of the students who attended were female (73%). Most of these students were white (53%) or African American (33%). The average age of the students was 23. The majority of these students were not first generation college students (53%). They had an average Reading ACT score of 21. More freshmen came than any other group (47%). Most of them completed the class with a final grade of A, B, or C (87%). The average final grade of students who attended tutoring was 2.8, which is equivalent to a C+. After the class was completed, the students had an average Grade Point Average (GPA) of 3.26, which means the average grade students had earned in all the classes they had taken was a B. Table 2 shows how the students who attended tutoring sessions at the PSSC during Spring 2018 compare to the overall group of students enrolled in PSY 1410 that semester for the five sections included in the current study. Of these 15 students, 11 (73%) requested to be sent a reminder message before their next session. While 60% ( $n = 9$ ) of students returned for two sessions, only 33% ( $n = 5$ ) returned three or more times.

#### **Hypothesis 1**

It was hypothesized that compared to spring 2016 and 2017 when text message reminders were not in use, students in spring 2018 who received the reminder messages would be more likely to return to the PSSC for multiple sessions. A time series analysis was used to determine if more students in spring 2018 returned for multiple tutoring sessions compared to spring 2016 and 2017. Independent-Samples Kruskal-Wallis Test (a nonparametric test) indicated that there was no difference between the three semesters in

Table 2

*Descriptive statistics for those who attended tutoring at the PSSC and all enrolled in PSY 1410 for the spring 2018 semester.*

---

	<u>Students who attended the PSSC</u>	<u>Overall</u>
First Generation		
Yes	47%	37%
No	53%	63%
<i>M</i> Reading ACT	21	22
Final Grade		
Passed with A, B, or C	87%	77%
Failed with D, W, or F	13%	23%
<i>M</i> Grade	2.8	2.57
<i>M</i> Overall GPA	3.26	2.75

---



the number of students who returned more than one sessions, indicating that the reminder messages did not have a significant impact on the rates of students returning to tutoring ( $p = 0.45$ ).

Additionally, an Independent- Samples Kruskal-Wallis Test also was run to determine if any difference existed between the semesters in the number of students who came to tutoring at least once. These results indicated that there was no significant difference between the three semesters in the number of students who came to the PSSC at least once ( $p = 0.11$ ).

The data in Table 3 further explores the trends in attendance to the PSSC across the 2016-2018 spring semesters. There were three instructors across the five sections. While the rates of attendance did not vary greatly between years within a section, there did appear to be a difference between instructors. Specifically, section 4 and 5 (taught by same instructor) had higher participation rates than section 1 (taught by the 2<sup>nd</sup> instructor) and sections 2 and 3 (taught by the 3<sup>rd</sup> instructor).

## **Hypothesis 2**

It was hypothesized that students who attended three or more tutoring sessions ( $n = 5$ ) in spring 2018 would have a lower percentage of DWFs (drop/withdraw/fail) than the students who attended only one or two sessions ( $n = 10$ ). The One-way ANOVA was not statistically significant,  $F(1, 14) = 0.22, p = 0.64$ . Of the students who attended three or more tutoring sessions in spring 2018, 23% received a grade of D, W, or F. Of the students who attended only once or twice in spring 2018, 30% received a grade of D, W, or F.

Table 3

*Percentage of Attendance to PSSC by Section and Year*

	<u>% 0<sup>a</sup></u>	<u>% only 1<sup>b</sup></u>	<u>% &gt; 1<sup>c</sup></u>
<b>Section 1</b>			
2016	99.33	0.67	0
2017	93.29	2.01	4.71
2018	95.95	2.03	2.03
<b>Section 2</b>			
2016	100	0	0
2017	100	0	0
2018	100	0	0
<b>Section 3</b>			
2016	99.03	0	0.97
2017	100	0	0
2018	100	0	0
<b>Section 4</b>			
2016	93.24	4.05	2.70
2017	87.67	9.59	2.74
2018	95.95	2.70	1.35
<b>Section 5</b>			
2016	95.71	2.86	1.43
2017	87.67	8.22	4.11
2018	90.32	1.61	8.06

*Note:*<sup>a</sup> never attend; <sup>b</sup>attended only 1 time; <sup>c</sup>attended more than 1 time

### Hypothesis 3

It was hypothesized that students in the spring 2018 semester who had opted in to receive a text message reminder would report on the PSSC session evaluation that they found the reminder messages helpful. The last question on the session evaluation form asked the students to rate whether they found the reminder message helpful on a 5-point Likert scale from *strongly disagree* to *strongly agree*. Students answered this question if they returned for more than one session and had received a reminder message (number of session evaluations  $n = 22$ ). On average, students rated the statement at 3.55. This means the students agreed that the reminder was helpful on average.

### Additional Analyses

Further analyses were done using to look for any significant differences in how the students who returned to the PSSC (i.e., attended more than once) answered the session evaluation compared to those who did not return (i.e., attended only once). Due to the small sample size, the 5 point liker scale responses were recoded into a dichotomous variable. *Strongly agree* (5) and *agree* (4) were compared to *neutral* (3), *disagree* (2) and *strongly disagree* (1). Chi-Square analyses were then run for the session evaluation variable.

As can be seen in Table 4, the only significant difference was on the question that asked whether or not the student planned to return to the PSSC ( $p = .02$ ). Of the surveys belonging to students who returned for subsequent sessions, 94% said they *strongly agreed* or *agreed* with the statement about planning to return to the PSSC that term. When looking at the surveys of students who did not return, only 83% marked *strongly agree* or *agree* with that statement.

Table 4

*Results of the PSSC Session Evaluation Forms*

	Attended more than once <sup>a</sup> ( <i>n</i> = 33)		Attended only once <sup>b</sup> ( <i>n</i> = 6)		Chi <sup>2</sup>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
I enjoyed attending my study session today.	4.48	0.57	4.83	0.41	0.187	.67
I reevaluated my study methods as a result of today's session.	3.97	0.81	4.67	0.82	0.300	.58
<sup>c</sup> I will use the information I learned today when I study in the future.	4.55	0.51	5.00	0.00		
I learned about a new study resource/ technique today.	3.70	1.08	5.00	0.00	3.545	.06
I was able to explain to my Peer Assistant how he/she could assist me.	4.28	0.68	4.67	0.82	0.077	.78
I better understand the course material as a result of my session today.	4.24	0.66	5.00	0.00	0.810	.37
I feel my ability to succeed in PSY 1410 has been increased due to this session.	4.18	0.73	4.50	0.84	0.008	.93
I will return to the Student Success Center.	4.64	0.49	4.67	0.82	5.645	.02

Table 4 *Continued*

	Attended more than once <sup>a</sup> ( <i>n</i> = 33)		Attended only once <sup>b</sup> ( <i>n</i> = 6)		Chi <sup>2</sup>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
I will recommend the Student Success Center to other PSY 1410 students.	4.55	0.62	4.83	0.41	0.383	.54

*Note.*<sup>a</sup> number of session evaluation forms completed by those who attended more than once. <sup>b</sup> number of session evaluation forms completed by those who attended only one session. <sup>c</sup> No statistic could be computed because all scores were *strongly agree* (5) or *agree* (4).

## CHAPTER IV

### Discussion

#### Hypothesis 1

The first hypothesis looked at whether students during the Spring 2018 semester who received reminder messages were more likely to return for additional tutoring sessions compared to the previous two springs when no reminders were sent. The analysis revealed that there was not a statistically significant difference in the rate of return between the three spring semesters. This result was unexpected based on previous research in the medical field (Branson et al., 2013; Farmer et al., 2014; Hasvold & Wootton, 2011; Mohammed et al., 2012), where the studies showed success in increasing appointment attendance and treatment compliance. It was hoped that this success with reminder messages could be translated to an educational setting to improve re-attendance.

#### Hypothesis 2

The second hypothesis looked at whether the students who attended the PSSC during the spring 2018 semester three or more times had lower rates of D's, W's, and F's as final course grades compared to those who attended only once or twice. Previous research (Bartoszewski & Gurung, 2015; Dunlosky et al., 2013; Lopez et al., 2013; Lynch, 2006; Schneider & Preckel, 2017) has shown a positive relationship between teaching effective learning strategies such as those covered in the PSSC and student course outcomes as well as retention. Research also has shown that tutoring has larger positive effects the more students attend (Cooper, 2010; Munley, Garvey, & McConnell, 2010). Analysis revealed there was not a statistically significant difference between the students who attended the PSSC three or more times ( $n = 5$ ) during spring 2018 and those

who attended only once or twice ( $n = 10$ ). The small number of students that received tutoring in the PSSC ( $n = 15$ ) during the spring 2018 semester could have impacted the power of this analysis leading to the nonsignificant findings. It should be noted, as can be seen in Table 2, only 13% of the students that attended the PSSC during this term earned a D, W, or F compared to an overall rate of 23% across the five sections analyzed in the current study.

### **Hypothesis 3**

The third hypothesis examined how students felt about receiving the reminder messages during the Spring 2018 semester by analyzing their responses on the PSSC session evaluation form. Overall, the average of the survey question about the reminder showed that the students agreed that it helped encourage them to re-attend. This finding is consistent with the work of Muhammed et al. (2012) whose study also showed that participants had positive feelings toward the reminder messages.

### **Limitations**

As noted previously, there is historically a low attendance rate in the PSSC during the spring semesters. The current study had a very small sample size in some of the analyses. As note above in the discussion of the findings from hypothesis 2, this may have made it difficult to find statistical significance in the results due to the lack of statistical power. Specifically, across five sections there were only 15 students who attended the PSSC during the spring 2018 semester. Of those, only 5 returned for three or more sessions. Additionally, having an opt-in system for receiving the reminder messages may have decreased their utilization by the students attending tutoring. Some of the

students ( $n = 27\%$ ) opted out by not providing contact information for where a reminder message could be sent.

### **Future Direction**

Since colleges continue to use peer tutoring as a method for helping students, this is an area where more research would be beneficial. Learning more about what motivates students to attend tutoring would be very beneficial. As can be seen in Table 4, rates of attendance at the PSSC vary greatly by instructor. Some professors have shown increased attendance by offering extra credit to students who attend. This is an area that would be beneficial to research, so professors could see the potential impact of offering extra credit.

Another area to look at in the future is whether a different format of reminder message might be more effective. Perhaps emails would seem more formal and encourage the students to not miss scheduled appointments. An additional option would be handing out appointment cards noting when the student decided when to return. The student could then place the card in a place he or she would notice it and be reminded that way. It is possible that having something written out by hand might be more personal and help the student feel more inclined to return.



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**APPENDICES**

## APPENDIX A

## PSSC Session Evaluation Form

M#: \_\_\_\_\_ Date: \_\_\_\_\_

Peer Assistant: \_\_\_\_\_

Please read the following questions carefully and answer honestly. For each statement, circle the appropriate number corresponding to your level of agreement. Your responses will lead to improved experiences for students at the Psychology Student Success Center.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>I enjoyed attending my session today.</b>	1	2	3	4	5
<b>I reevaluated my study methods as a result of today's session.</b>	1	2	3	4	5
<b>I will use the information I learned today when I study in the future.</b>	1	2	3	4	5
<b>Which learning strategies will you use when you study in the future? (please check all that apply)</b>					
<input type="checkbox"/> <b>Distributed Practice</b>					
<input type="checkbox"/> <b>Practice Testing</b>					
<input type="checkbox"/> <b>Elaboration Strategies</b>					
<input type="checkbox"/> <b>Self-Explanation</b>					
<input type="checkbox"/> <b>Interleaved Practice</b>					
<b>I learned about a new study resource/ technique today.</b>	1	2	3	4	5

---

<b>For quality assurance purposes please choose “disagree”.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>I was able to explain to my Peer Assistant how he/she could assist me.</b>	1	2	3	4	5
<b>I better understand the course material as a result of my session today.</b>	1	2	3	4	5
<b>I feel that my ability to succeed in PSY 1410 has been increased due to this session.</b>	1	2	3	4	5
<b>I will return to the Student Success Center.</b>	1	2	3	4	5
<b>I will recommend the Student Success Center to other PSY 1410 students.</b>	1	2	3	4	5
<b>The text message reminder encouraged me to return to the PSSC.</b> NA	1	2	3	4	5

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## APPENDIX C

### IRB Approval

## IRB

### INSTITUTIONAL REVIEW BOARD

Office of Research Compliance,  
010A Sam Ingram Building,  
2269 Middle Tennessee Blvd  
Murfreesboro, TN 37129  
IRBN001 Version 1.3 Revision Date 03.06.2016



### IRBN001 - EXPEDITED PROTOCOL APPROVAL NOTICE

Tuesday, March 27, 2018

Principal Investigator **Aimee Holt** (Faculty)

Faculty Advisor NONE

Co-Investigators Greg Schmidt and Meghan Bentley (Student)

Investigator Email(s) [aimee.holt@mtsu.edu](mailto:aimee.holt@mtsu.edu)

Department Psychology

Protocol Title ***Program evaluation of the MTSU Psychology Student Success Center***

Protocol ID **18-2165 (18-1165)**

Dear Investigator(s),

The above identified research proposal has been reviewed by the MTSU Institutional Review Board (IRB) through the **EXPEDITED** mechanism under 45 CFR 46.110 and 21 CFR 56.110 within the category (5) *Research involving materials*. A summary of the IRB action and other particulars in regard to this protocol application is tabulated below: IRB Action APPROVED for one year from the date of this notification

Date of expiration **3/31/2019**

Participant Size NOT APPLICABLE

Participant Pool **General adults (18 years or older) - MTSU students who take tutoring services at the University's library**

Exceptions Active informed consent is waived

Comments: Originally requested for IRB approval through Exempt Category 4 (18-1165)

This protocol can be continued for up to THREE years (**3/31/2021**) by obtaining a continuation approval prior to **3/31/2019**. Refer to the following schedule to plan your annual project reports and be aware that you may not receive a separate reminder to complete your continuing reviews. Failure in obtaining an approval for continuation will automatically result in cancellation of this protocol. Moreover, the completion of this study MUST be notified to the Office of Compliance by filing a final report in order to close-out the protocol.



**Continuing Review Schedule:****Reporting Period Requisition Deadline IRB Comments**

First year report 2/28/2019 NOT COMPLETED

Second year report 2/28/2020 NOT COMPLETED

Final report 2/28/2021 NOT COMPLETED

**Post-approval Protocol Amendments:****Date Amendment(s) IRB Comments** NONE

The investigator(s) indicated in this notification should read and abide by all of the post-approval conditions imposed with this approval. [Refer to the post-approval guidelines posted in the MTSUIRB's website](#). Any unanticipated harms to participants or adverse events must be reported to the Office of Compliance at (615) 494-8918 within 48 hours of the incident. Amendments to this protocol must be approved by the IRB. Inclusion of new researchers must also be approved by the Office of Compliance before they begin to work on the project. All of the research-related records, which include signed consent forms, investigator information and other documents related to the study, must be retained by the PI or the faculty advisor (if the PI is a student) at the secure location mentioned in the protocol application. The data storage must be maintained for at least three (3) years after study completion. Subsequently, the researcher may destroy the data in a manner that maintains confidentiality and anonymity. IRB reserves the right to modify, change or cancel the terms of this letter without prior notice. Be advised that IRB also reserves the right to inspect or audit your records if needed.

Sincerely,

Institutional Review Board

Middle Tennessee State University

Quick Links:

[Click here](#) for a detailed list of the post-approval responsibilities.More information on expedited procedures can be found [here](#).