The Effect of Nudging on the Utilization of Counseling Services and the Implications on College Student Involvement

Foteini Tzachrista*

Click here for the most recent version of the paper.

Abstract

The rising suicide rate among adolescents in the US has created the need for an intervention that can improve outreach activities and increase the utilization of mental health services. In this study, I ran a randomized control trial involving nudging to establish a pro-counseling social norm and to increase on-campus mental health services utilization through the Student Health Services at the University of South Carolina. To implement my design, I sent campus-wide emails to inform students of the mental health services offered on campus. Randomly selected students received either a simple informative message or a nudging message. The nudging message included a highlighted descriptive social norm statement. Within each group, randomly selected students received the message either once or twice during the semester. Findings indicate that the effectiveness of the nudge varied by race. Nudging impacted the rate of treatment for White students in the second round, when there was higher email engagement, while nudging impacted Black and Asian students from the very first round, despite the lower email engagement. Receiving the nudging email in the first round increased the likelihood of utilizing counseling for Black students by 53% and for Asian students by 54% relative to their respective mean levels. Furthermore, nudging increased the probability of Black students going to a social on-campus event by 23% relative to the mean, unveiling synergies between receiving help and student involvement. The efficiency of nudging reveals the prevalence of stigma and/or other pragmatic barriers that are more prominent among minorities.

Keywords: nudging, social norms, mental health care utilization, student involvement
JEL Codes: D910, I12

*Department of Economics, Darla Moore School of Business, University of South Carolina.

1 Introduction

According to the Centers for Disease Control and Prevention (CDC), suicide is the second leading cause of death for adolescents aged 15 to 24 years.[1] Using 3-year averages from 2007–2009 to 2016–2018, CDC reports that suicide rates in the United States increased by 47.1%, with South Carolina experiencing an increase of 56%.[2] The Substance Abuse and Mental Health Services Administration (SAMHSA) reported that in 2019 11.5% of young adults between 18 and 25 years old had serious thoughts of suicide, 3.9% planned suicide, and 1.8% attempted suicide.[3] In the same year, the American College Health Association–National College Health Assessment (ACHA-NCHA) surveyed 38,679 students from 58 colleges and found that 21.6% of students felt moderate and 19.5% felt serious psychological distress.[4] At the University of South Carolina (UofSC), 10% of surveyed students seriously considered suicide, 6% intentionally caused harm to themselves, and 1.3% attempted suicide within a 12-month period.[5] Ketchen Lipson et al. (2015) reported that, based on the studies of Kisch et al. (2005) and Gallagher (2006), over 80% of students who die by suicide have never been seen by their campus mental health service. These statistics clearly demonstrate the imperative need for accessible mental health services in colleges.

Despite the deep need for mental health care, the rate of treatment is relatively low at UofSC compared to the national average of colleges. In the 2019 ACHA-NCHA survey, 25.4% of students responded that they received psychological or mental health support within the past 12 months, with the majority going to the on-campus health and/or counseling center.[6] Lipson et al. (2019) analyzed data from the Healthy Minds Study, conducted across 196

[1] NCHS Data Brief No. 352, October 2019.

[2] National Vital Statistics Reports, Vol. 69, No. 11, September 11, 2020.

[3] 2019 National Survey of Drug Use and Health (NSDUH) Releases.

[4] American College Health Association–National College Health Assessment, Undergraduate Student Reference Group, Executive Summary, Fall 2019, p.13

[5] See the ACHA-NCHA (2017) survey for UofSC. For reference, UofSC is a public research urban university located at the capital of the state of South Carolina in Columbia. It has over 36,000 students with more than 26,000 undergraduate students.

[6] American College Health Association–National College Health Assessment, Undergraduate Student Reference Group , Executive Summary, Fall 2019, p.5

campuses in the US, and found that the rate of treatment increased from 2007 to 2017[7] and, during the 2016-2017 academic year, the rate of treatment was 34%.[8] However, during the fall semester of 2019 at UofSC, less than 9% of students visited an on-campus mental health service (including counseling, psychiatry, group counseling, and coaching), and the majority of them visited the service only once.

Students may not utilize college mental health services for various reasons. Czyz et al. (2013) found that students at heightened risk tend to not go to counseling primarily because they do not think it is necessary, are busy, and think they can manage by themselves. Other reasons mentioned, in order of frequency, were as follows: they were seeking help from their family and friends; pragmatic barriers to accessing services, such as long waiting periods; financial concerns; not knowing where to go; stigma; doubt that professional help would be beneficial; and negative past experiences with professional help. Summarizing 146 relevant papers, Hom et al. (2015) added that help-negation and fear of hospitalization are two more reasons why individuals with acute suicidal ideation may avoid seeking help. When designing the mechanism for this paper, I considered these barriers to access, and gathered anecdotal evidence from discussions with Student Health Services (SHS) officials about the norm around mental health at UofSC.

Many studies on reasons for low-utilization of mental health services have underestimated the effect of stigma on seeking help. As Hom et al. (2015) explained, researchers used to ask individuals if they would think less of a person for seeking mental health treatment, and since the respondents knew that stigmatization is not socially acceptable, their answers were potentially biased. Lipson et al. (2019) found that stigma has decreased from 2007 to 2017; yet in the 2016-2017 academic year, 46% of college students still believed that others think less of a person who has received mental health treatment. Officials at UofSC have raised

[7]Other studies like Eisenberg et al. (2011), Blanco et al. (2008) Wu et al. (2007) and Drum et al. (2009) have also looked at utilization and calculated lower rates of treatment but their data are not as recent.

[8]Although the Healthy Minds Study is a statewide study, its response rate has been declining throughout the years. For reference, the response rate in the 2016-2017 academic year was 23%. This may have caused an overestimation of the rate of treatment since students who were utilizing the services may have also been more inclined to answer to the survey.

concerns about stigmatization on campus, relying on studies like Brown et al. (2014) that suggested that stigma may be more prevalent in the US South than in other parts of the country.[9] From anecdotal evidence, stigma seems to be partially driven by students' fear of admitting their failure to enjoy student life or "the best years of their lives." Promoting services within a pro-counseling social framework—a university culture that embraces seeking help—may help combat stigma, decrease barriers to treatment, increase awareness of services, and encourage utilization.

Racial and ethnic minorities tend to underutilize mental health services due to greater barriers and stigma. Several studies have found that Black, Asian, and Hispanic college students seek mental health treatment less often, schedule less follow-up appointments, and report more barriers to treatment compared to White students (Miranda et al. (2015), Eisenberg et al. (2012), Herman et al. (2011) and Masuda et al. (2009)). Financial concerns and lack of time were the most common barriers to treatment in these studies and minorities reported stigma-related concerns more often than their White peers. Masuda et al. (2009) found that Black and Asian students showed less favorable attitudes on a variety of help-seeking attitudes. Herman et al. (2011) and Miranda et al. (2015) agreed that outreach efforts should seek to remove barriers to treatment and improve utilization of mental health services for racial and ethnic minorities on campus. In this study, nudging affected minority students the most. This could be because nudging lowered the perception of pragmatic barriers and/or stigma on campus.

While extensive literature exists on the rate of treatment and barriers to treatment, there have been few published peer-reviewed papers on interventions that increase utilization of services (Hom et al. (2015)). Most proposed interventions involve communication efforts, psychoeducation interventions, peer training, gatekeeper training, and screening.[10] Several

[9]Stigma is a big concern for students, faculty and staff. UofSC's student government tried to reduce stigmatization by organizing events such as the "Stigma Free USC" week in 2018.

[10]For communication interventions see papers like Demyan and Anderson (2012), for psychoeducation interventions see Cusimano and Sameem (2011), Bean and Baber (2011), King et al. (2011), Aseltine et al. (2007), Aseltine Jr and DeMartino (2004) and Pinfold et al. (2003), for peer training interventions see Kalafat and Elias (1994) and Wyman et al. (2010), for gatekeeper training see papers like Wyman et al. (2008) and

of the existing studies on interventions have suffered from three issues: low survey response rates; failure to connect interventions to post-intervention behavior; and lack of randomization, which can induce estimation bias.[11] The intervention I designed in partnership with SHS at UofSC tackled all of these issues: it did not rely on student response rates, measured actual behavior post-treatment, and was randomized.

I based my randomized control trial on nudging, a technique popularized by Thaler and Sunstein (2008), which I used to test whether suggesting a positive norm affects the utilization of services. Nudging, often a cost–and time–effective technique, alters the choice architecture of subjects with the objective of more desirable decision making. I specifically employed social norm nudging, one of the various forms of nudging. There are two kinds of social norms: descriptive and injunctive. Descriptive norms represent the perception of what others do and injunctive norms represent what others approve or disapprove of. I used a descriptive norm nudge based on data from UofSC's NCHA (2019) and the Healthy Minds Study (2018). I first presented the students receiving a nudging email with the descriptive norm nudging statement–that claims most of their classmates would consider help if needed, and most would consider that help effective–before providing a description of on-campus mental health service options.

The nudge can increase the utilization of services for three reasons. First, according to the long-standing psychology literature, informing subjects of the majority behavior instigates imitation of and conformity to this majority behavior.[12] As Tversky and Kahneman (1981) suggested, subjects' preferences depend on the framing of the problem. In this study, the norm nudging statement framed the student's own choice to seek mental health care within the idea that the majority of other students would seek help if needed. Second, the nudging statement highlighted that the utilization of services has been proven effective for

for screening see papers like King et al. (2015), Moutier et al. (2012) and Haas et al. (2008). For interventions specifically about stigma see Thornicroft et al. (2016).

[11] Moutier et al. (2012), Haas et al. (2008)) had low response rates. Wyman et al. (2010), Wyman et al. (2008)) failed to connect interventions to post-intervention behavior. Freedenthal (2010), Pinfold et al. (2003) and Bean and Baber (2011) did not randomize treatment.

[12] See for example Asch (1956).

the majority of students. Third, the nudging statement aimed to establish a pro-counseling social norm against the potential stigma surrounding mental health service utilization. If the majority of students would consider seeking help, then presumably the same majority would not think less of others that do so. Along the same lines, if other students considered help then, therapists must be accustomed to students admitting their need for support, alleviating ones' embarrassment of doing so, as well.

Norm nudging has been widely used in a variety of field experiments: studies on reducing littering, tax evasion, timely payment of loans, increasing voluntary provision of public goods, charitable giving, energy conservation, improving food choices, moderating prescription of antibiotics and preventing gender-based violence.[13] In college studies, norm nudging has been used in the context of food choices, college drinking, fee collection and suicide prevention.[14] I extend research done by Bauer et al. (2019), in which the authors measured whether students who received an email with a nudge clicked more times on links embedded in the email than students who received the same email but without the nudge. The links in the study guided students to participate in a free online mental health intervention and listed mental health resources. Bauer et al. found that the links in the nudging email were clicked 67% more times than the links in the basic email without the nudge. Building on Bauer et al. (2019), my study–to the best of my knowledge–is the first to follow students post-treatment to look at their use of services. I also investigated the effect of the nudge on student involvement as a predictor of students' sense of belonging and a representation of a more long-lasting effect.

Student involvement has been linked to better mental health, greater sense of belonging, improved academic outcomes, and higher retention.[15] I measure students' involvement by

[13]For papers regarding nudging and littering see Cialdini et al. (1990), tax evasion see Hallsworth et al. (2017) and Coleman (1996), timely payment of loans see Bhalla et al. (2021), voluntary provision of public goods see Shang and Croson (2009), charitable giving see Sanders (2017), energy conservation see Allcott (2011), recycling see Czajkowski et al. (2019), Loschelder et al. (2019), Cialdini (2003) and Schultz (1999), a review of improving food choices see Bucher et al. (2016), prescription of antibiotics see Hallsworth et al. (2016) and for gender-based violence see Bellatin et al. (2021).

[14]For papers regarding nudging in college and its effects on food choices see papers like Mollen et al. (2013)), on college drinking see Borsari and Carey (2003), and Perkins (2002), on fee collection see Silva and John (2017) and on suicide prevention see Bauer et al. (2019)

[15]See for example Friedlander and MacDougall (1992), Grant-Vallone et al. (2003), Purswell et al. (2008)

their attendance of social events, and visits to the wellness and fitness center. Attendance of social events aims to capture social inclusion, while visits to the wellness and fitness center aim to capture students' care for their physical health. These are the two major channels of tracked on-campus student involvement. Positive effects of nudging on any of these measurements would suggest that there are positive synergies between receiving mental health care and involvement that can further promote better mental health.[16] Any synergy could also imply a longer-lasting effect of the nudge that goes beyond just receiving professional help.

While most papers that implement nudging find a positive and significant change in behavior, several studies have not been successful.[17] Regarding these unsuccessful studies, Bicchieri and Dimant (2019) suggest that designing a successful nudge requires understanding what motivates certain choices. In the following section, I discuss how I incorporated several of their observations in designing the nudging statement.

2 Experiment

2.1 Data Collection

I partnered with the SHS, the Communications and Public Affairs office and the department of Student Life at UofSC in the fall of 2019 to email the entire undergraduate student body that consisted of 26,570 students about the mental health services provided on campus. Prior to the experiment, I received a de-identified database, with students' basic demographic characteristics to randomize students into 4 treatment groups. The experiment was conducted in two rounds: at the first third of the semester and at the second third of the semester. Within those rounds students either received a basic information email or a nudging email. At the

Keyes et al. (2012), Fink (2014), Cleofas (2020).

[16]See for example Fink (2014).

[17]See for example Cialdini (2003), Allcott (2011), Allcott and Rogers (2014), Ayres et al. (2013), Schultz et al. (2008), Reese et al. (2014) Silva and John (2017). See also Hummel and Maedche (2019) for a review on the effectiveness of nudges.

end of the semester, I received an administrative data set with the student demographics, the number of counseling, psychiatry, group therapy and coaching sessions, the number of visits to the wellness and fitness center, and the number of social events students attended after the first and second round of the experiment.

2.2 Design

The experiment followed a 2x2 between-subjects design with variation on the content and the frequency of emails (see table 1). The objective was to create two emails: a basic information email and a nudging email. The basic information email had to include details on the services offered on campus and instructions on how to schedule appointments. The nudging email included the same information along with a highlighted descriptive social norm statement in the very first line (see figures 1 and 2). The only difference between the basic information email and the nudging email was that the nudging one included a descriptive social norm statement that read "83% of students at UofSC would consider seeking help if a personal problem was bothering them, and almost 90% of students at UofSC who have sought help for their mental or emotional health found it helpful."

According to Bicchieri and Dimant (2019), the social norm statement should be designed very carefully to maximize its effectiveness. Individuals prefer to conform to a social norm if they think that the majority in their reference network conforms to it and believes that the individuals ought to conform to it, too. To make sure, students believed the social norm statement used in this paper, I included information from the NCHA (2019) and the Healthy Minds Study (2018) and I listed these sources in the actual email. From these two surveys, I picked the most positive statements to instigate positive behavioral change. Nowadays, it is common belief that mental health treatment is beneficial, especially among younger generations, hence, students could perceive seeking help as a positive behavioral decision. To make sure that the messenger is trusted, UofSC's logo was prominently placed and the emails were sent through the Communications Office of UofSC, following the guidelines used

for other massive campus-wide communication efforts. According to Bicchieri and Dimant (2019), it is also important to refer to a specific reference network in the statement instead of using vague expressions. Therefore, I referred specifically to UofSC students as the point of reference in the descriptive norm-nudging statement.

Bicchieri and Dimant (2019) also explained that empirical messages may be ineffective if the information provided is not aligned with subjects' beliefs. While I could not control students' beliefs, the nudging statement I used refers to a high percentage of students who "consider seeking help" which is more convincing compared to a high percentage of students who actually seek help, which in reality is low. Then, the statement continues referring to those who "have sought help". Since most students do not seek help it might be harder to have firm beliefs about the usefulness of the services if they have never tried them before. Racial minority students may have stronger beliefs against both statements. If that is the case, the effectiveness of nudging for racial minorities could be lower compared to White students and compared to what it could be if they trusted that the statement is valid.

Undergraduate students were evenly allocated into 4 groups: the "Info", the "Info x 2", the "Nudge" and the "Nudge x 2" groups. The "Info" group received the basic information email only on September 24th of 2019. The "Info x 2" group received the basic information on September 24th and October 29th. The "Nudge" group received the nudging email only on September 24th of 2019. The "Nudge x 2" group received the nudging email on September 24th and October 29th. I refer to the September 24th emails as the first round of emails and to the October 29th as the second round of emails.[18] Although there is mixed evidence on the long-term effects of nudging,[19] Treatment was repeated in an effort to examine whether nudging is more or less effective at a time when students were busier, which is a common reason used to avoid seeking help (Czyz et al. (2013)).[20] The number of

[18]In other words, in the first round, the 'Info" and "Info x 2" groups received the basic information email and the "Nudge" and "Nudge x 2" groups received the nudging email. In round 2, only "Info x 2" received the basic information email and "Nudge x 2" received the nudging email.

[19]See for example Dupas (2011), Giné et al. (2010), Gneezy et al. (2011).

[20]UofSC is in a semester system with two 15-week terms: fall and spring of each year. In the fall of 2019 classes started on August 16 and ended on December 6th. Students tend to be busier around the time of

counseling, psychiatry, coaching, group therapy visits, social event attendance and visits to the wellness and fitness center were counted from September 25th to October 29th for the first round and from October 30th to December 4th for the second round.[21,22]

The randomization of students into 4 groups was completed using block randomization. Block randomization uses variables that predict the outcome to distribute subjects of similar characteristics into the treatment groups. Blocking on prognostic covariates helped improve the precision with which treatment effects were estimated.[23] By blocking, the variance of the error is reduced, because subjects are more homogenous. It also eliminates correlation between the assigned treatment and the variables used to form blocks. With the randomization in blocks, I avoided any rogue randomizations and ensured that different subgroups would be available for the analysis. According to SHS officials' observations and perceptions as well as previous literature, the covariates that were most possibly strong predictors of the utilization of counseling were sex, race, ethnicity and class. They were also suspecting that honors students may be utilizing counseling more than non-honors students. For that reason, I used sex, race, ethnicity and class as blocks and randomized treatment 1,000 times, picking the randomization that balanced sex, race, ethnicity, class and honors status best.[24]

One of the biggest concerns in designing this intervention was whether students were actually going to read the emails sent. For that reason, I embedded links on the emails which I tracked to count the total number of clicks. There were 3 links in each email, and I was not able to track the total number of clicks to those links. The system through which email engagement was tracked did not allow tracking of the unique number of clicks. Therefore, if a student clicked two of those links, the total number of clicks would increase

the second round of emails as this is around midterms and class projects due dates.

[21]This timeline was chosen to ensure that students were not identified in the data.

[22]The study was reviewed and approved by the institutional review board (IRB) at UofSC.

[23]Blocking is typically used to improve precision especially when the sample size is small. The sample size of all students was relatively large in this paper but the sample of minorities was much smaller. Even when the sample size was large, the average treatment effect was expected to be very small because very few students go to counseling so added precision could help in detecting a significant effect.

[24]If I were to use honors status as a block variable, some of the blocks would have had very few observations to allocate in the four treatment groups.

by two, Also, if they went back and clicked the same links two more times the number of clicks would go up by two again. While this is somewhat restricting, I can still compare the number of clicks on the informative and the nudging email and I can compare email engagement across rounds.

3 Model

In order to find the effect of the nudge on the utilization of services, I estimated two models reflecting on the different decision mechanisms behind requesting professional help. The decision to schedule a first visit can be very different than the decision of scheduling a second or subsequent visits. The first visit at the mental health services at SHS is a triage appointment (coded as a counseling visit) that determines the needs of a student. Subsequent visits are typically scheduled if both the therapist and the student find it necessary to continue. After the first triage appointment, the therapist could also advise the student to use a different service such as psychiatry, group counseling or coaching. Thus, I estimated separately the effect of the nudge on the probability of going to counseling (extensive margin) and on the number of visits for the students who were already going to counseling (intensive margin). The two models are described in equations (1) and (2).

$$P(Visits_i) = F(x_i'b), \tag{1}$$

$$E(Visits_i|Visits_i \geq 1) = e^{x_i'\phi} \tag{2}$$

where $F(x_i'\beta)$ in equation (1) is the logistic cumulative distribution function. The exponential distribution in equation (2) is estimated using a poisson quasi-likelihood estimation.[25]

In the first round, the "Info" and "Info x 2" groups received the same basic information email, while the "Nudge" and "Nudge x 2" groups received the same nudging email. In

[25]Results using a negative binomial model, instead of a poisson, can be provided upon request. Estimates were robust to the application of a negative binomial model.

the second round, only the "Info x 2" and "Nudge x 2" received the basic and the nudging email, respectively. Therefore, the estimations for the two rounds have the controls shown in expressions (3) and (4). The coefficient of interest in the first round is the effect of the nudge on the probability of going to counseling and the number of visits for the students who already go to counseling (α_1 and β_1, respectively). In the second round, the coefficients of interest are γ_2 and δ_2, which reflect the effect of receiving a second email among those who received the basic information emails in the first round, $\gamma_2 + \gamma_3$ and $\delta_2 + \delta_3$, which reflect the effect of receiving a second nudging email among those who received the nudging email in the second round, and more importantly the difference-in-difference estimates γ_3 and δ_3 that reflect the effect of the nudge in the second round.[26]

$$\text{In round 1:} \quad x_i'b = \alpha_0 + \alpha_1 Nudge_i + \epsilon_i, \tag{3}$$
$$x_i'\not{o} = \beta_0 + \beta_1 Nudge_i + \zeta_i,$$
$$\text{In round 2:} \quad x_i'b = \gamma_0 + \gamma_1 Nudge_i + \gamma_2 Reminder_i + \gamma_3 Nudge_i \cdot Reminder_i + \eta_i, \tag{4}$$
$$x_i'\not{o} = \delta_0 + \delta_1 Nudge_i + \delta_2 Reminder_i + \delta_3 Nudge_i \cdot Reminder_i + \theta_i.$$

In order to find the effect of the nudge on involvement, I estimated a logit model on the probability of going to a social event, and to the wellness and fitness center (see equations (5) and (6)). In other words, a reduced form estimation was employed to investigate any synergies between the utilization of mental health services and student involvement on

[26]The results from all six group comparisons are available upon request.

campus.[27]

$$\text{In round 1:} \quad Involvement_i = \kappa_0 + \kappa_1 Nudge_i + \boldsymbol{\kappa X} + \iota_i \tag{5}$$

$$\text{In round 2:} \quad Involvement_i = \lambda_0 + \lambda_1 Nudge_i + \lambda_2 Reminder_i + \lambda_3 Nudge_i \cdot Reminder_i + \boldsymbol{\lambda X} + \xi_i \tag{6}$$

By choosing block randomization, I need to weight each observation by the inverse of the proportion of subjects in its block who were assigned to each treatment group.[28] Expression (7) shows how weights were calculated. More specifically, i represents the individual; j the block; P the probability individual i in block j was assigned to I (the "Info" group), Ix2 (the "Info x 2" group) and N (the "Nudge group"); d_{Ii} is equal to 1 if subject i was assigned to the "Info" group; d_{I2i} is equal to 1 if subject i was assigned to the "Info x 2" group and d_{Ni} is equal to 1 if subject i was assigned to the "Nudge" group.

$$w_{ij} = \frac{1}{P_{Iij}} d_{Ii} + \frac{1}{P_{I2ij}} d_{I2i} + \frac{1}{P_{Nij}} d_{Ni} + \frac{1}{1 - P_{Iij} - P_{I2ij} - P_{Nij}} (1 - d_{Ii} - d_{I2i} - d_{Ni}) \tag{7}$$

The block randomization improves estimate precision if the variables used for creating the blocks are predictive of the outcome. Hence, I also estimated the effect of the block variables on the probability of utilizing the services and the number of visits for the students who used the services at least once. All estimations controlled for honors status. To investigate the effect of the intervention for students of different racial backgrounds, I restricted the sample and estimated the same regressions for White, non-White, Black and Asian students.

For robustness, I compared effects with college fixed effects. I also estimated the effect

[27] One could think of using nudging as an instrument to counseling utilization to predict involvement. However, data on visits and social involvement were provided for the entire time span between rounds. Therefore, it is not clear whether the exclusion restriction holds.

[28] See Gerber and Green (2012) ch 4.5, p. 116-120. Each student in the "Info" group was weighted by the inverse of the proportion of subjects in their block who were assigned to the "Info" group. Similarly, each student in the "Infox2" group was weighted by the inverse of the proportion of subjects in their block who were assigned to the "Infox2" group. Each student in the "Nudge" group was weighted by the inverse of the proportion of subjects in their block who were assigned to the "Nudge" group and each student in the "Nudgex2" group was weighted by the inverse of the proportion of subjects in their block who were assigned to the "Nudgex2" group.

of the nudge on all visits, including counseling, psychiatry, coaching and group therapy. I also discuss the results estimated using ordinary least squares. All tables include p-values calculated using randomization inference of 1,000 repetitions to verify the significance of the results. Using randomization inference, I also plotted the density distributions of the estimates for better visualization of how extreme the results were under the implemented randomization.

4 Descriptive Statistics

The undergraduate student population at UofSC in the fall of 2019 consisted of 26,570 students. It was made up of 54% females, about 77% White, 8% Black, 5% Asian, 4% mixed-race, 0.3% other race, and 4% of Hispanic or Latino students. About 24% of students were freshmen, sophomores or juniors and about 28% were seniors.[29] 56% were in-state residents and 18% of students were in honors programs. In the first round of the study, 4.5% of students went to counseling at least once and 61% of them went only once. In the second round of the study, 4.6% of students went to counseling at least once and 69% of them went only once. In terms of involvement, less than 10% of students went to at least one on-campus social event, and about a third of the undergraduate population visited at least once the wellness and fitness center.

In order to assess the validity of the randomization of students into the four treatment groups, table 2 presents the summary statistics of student characteristics by treatment group. The first two columns include the average and standard deviation of students' characteristics in the "Info" group. The third and fourth columns include the average and standard deviation of students' characteristics in the "Info x 2" group. The fifth and sixth columns include the average and standard deviation of students' characteristics in the "Nudge" group. The last two columns include the average and standard deviation of students' characteristics in the "Nudge x 2" group. Overall, the averages and standard deviations were similar across the

[29]Classification was coded based on credit hours not cohort.

four groups.

To further assess the randomization process, Table 3 displays the results from mean comparison tests across the four groups. I cannot reject the null hypothesis that the averages were equal in 93% of the comparisons.[30] There were statistically significant differences in only 6 comparisons: the average number of White students (columns (1), (2) and (5)), the average number of mixed-race students (columns (1) and (6)) and the average number of honors students (column (6)). Tests for the joint significance of all variables to explain the treatment group assignment fail to be rejected in all cases (see last row called "P-value joint significance"). Therefore, the implemented randomization was valid.

Graphically examining the effect of the nudge on the average number of counseling visits, figure 3 plots the average number of counseling visits in the first round (Panel (a)) and in the second round (Panel (b)). In the first round, there was not any statistically significant difference in the average number of counseling visits between the groups that received the basic information email and the nudging email. However, in the second round the average number of counseling visits was somewhat higher (with the confidence intervals marginally overlapping) for the "Nudge x 2" group indicating that students who received the nudging email in the second round had a higher number of counseling visits on average. Figure 4 plots the average number of counseling visits by race (Panel (a) refers to the first round and Panel (b) to the second round). In the first round, the average number of counseling visits was very similar for White students in both groups. However, the average number of visits were higher for non-White, Black and Asian students in the "Nudge" group compared to the "Info" group. The average number of counseling visits for Black students seem to be the highest and most significant one. In the second round, the average number of counseling visits was higher for the White students in the "Nudge x 2" compared to the "Nudge" group. However, there was no such distinct difference for non-White, Black and Asian students with

[30]Table 3 calculates 84 mean comparisons out of which only 6 were statistically significant at conventional levels. Hence, 78 out of 84 or 93% of the time I cannot reject the null hypothesis that they averages are statistically equal to each other.

the error bars being wider due to smaller sample sizes in the second round compared to the first one. Overall, the nudge seems to have affected the average number of counseling visits for minority students in the first round and for White students in the second round.

Table 4 presents the number of email recipients and the number of total clicks in the links embedded in the emails sent. The number of clicks is indicative of the number of students who reacted to reading the e-mails. In the first round, the three links in the basic information email were clicked 3,339 times and the links on the nudging email were clicked 4,799 times. Hence, in the first round the links on the nudging email were clicked 44% more. In the second round, the three links in the basic information email were clicked 7,937 times and the links on the nudging email were clicked 5,534 times. Hence, in the second round the links on the nudging email were clicked 43% more. It is interesting to note that the links in the first round of emails were clicked less although they were sent to twice the amount of students the second round of emails were sent to. That could be because students typically receive more emails in the beginning of the semester which could lower their attention in each individual email. However, this difference could also be explained by the lower stress levels students have in the beginning of the semester compared to the middle of the semester. Interestingly, the difference in clicks between the treatment and the control groups in the first round was very similar to the same difference in the second round.

Bauer et al. (2019) found that their links in the nudging emails were clicked 67% more (n=57 vs 34). This is a higher percentage than this paper's percentage from the first round. Bauer et al. (2019) did not run their experiment a second time to be able to compare their findings with this paper's second round findings. Their subject pool consisted of 14,792 students, which was 44% smaller than mine. Yet, the total number of clicks in Bauer et al. (2019) was 99% lower than the number of clicks in the first round of this study. Although the percentage difference between the clicks on the nudging email and the basic email was slightly higher for Bauer et al. (2019), the level of engagement was higher in this study. Bauer et al. (2019) sent their emails mid-September during Suicide Prevention Week and

although mine were sent around the same time (on September 24th) there was no overlap with other interventions. Thus, it is possible that the effectiveness of emails was crowed-out by all of the other communication efforts happening at Suicide Prevention Week in the Bauer et al. (2019) study.

5 Experimental Results

5.1 The Effect of Block Variables on Utilization of Counseling

In this section, I present the effects of the block variables on the utilization of counseling. This is a necessary exercise to test whether block randomization increased the precision of estimates and to provide more context on the students that were more likely to receive help after the two rounds of the experiment. The effectiveness of block randomization relies on whether the block variables were actual predictors of the outcome. Data on the number of visits were made available after the experiment took place, so I could only test the effects of the block variables on the number of visits post-treatment. Table 5 displays the effects of the block variables on counseling visits after the first and the second round of emails. All block variables had a statistically significant effect on the outcome.

Notably, female students were about 3 percentage points more likely to go to counseling, after both the first and second round of emails. This finding represents roughly a 60% increase in the likelihood of going to counseling, relative to the baseline mean, which is consistent with the existing literature.[31] However, female students who utilized counseling at least once, visited the services almost 0.3 times less, after the first round of emails. This represents an 18% decrease, relative to the mean levels. The same effect was positive, yet insignificant, after the second round of emails. These findings could be explained by a male suicide that occurred a month before the first round of emails. Males could be less inclined to go to counseling, but when they do they could be in greater need of the services than

[31] See for example Eisenberg et al. (2012) and Drum et al. (2009).

females. For instance, male friends of the victim or other male students on campus, who were triggered by this tragic event, may have had a greater need to repeatedly utilize counseling compared to females. Male visits may have also been prioritized by the SHS. The fact that this effect was only significant in the first round could be explained by the fact that the first round was the closest one to the suicide.

Racial background also played a significant role in the utilization of counseling services. After the first round, Black students were 1.4 percentage points less likely to utilize counseling, which was a 28% decrease relative to the baseline average. After the second round, Black students were about 1.9 percentage points less likely to utilize counseling, which was a 37% decrease relative to the baseline mean. After the second round of emails, Black students, who made use of the service at least once, reduced the number of visits by 0.2, which was a 17% decrease relative to the baseline average, compared to their White peers. The same effect was not statistically significant after the first round of emails. The decrease in the number of visits for Black students who visited the services at least once could be greater in the second round because more Black students compared to White students work while in college; as the semester came to an end, the Black students may have had less time and flexibility to schedule a follow-up appointment.

Similarly, Asian students were about 2 percentage points less likely to utilize counseling after the first round of emails, and 1.4 percentage points less likely to utilize counseling after the second round of emails. These effects represented a 40% and a 28% lower rate of treatment relative to the mean levels, respectively. The effects on the number of services, for students who utilized the services, were statistically insignificant for Asian students, possibly due to the small number of Asian students who utilized counseling at least once. The results for Black and Asian students are aligned with the literature that has found lower rates of treatment for these racial minorities in the US.[32] Utilization was not statistically different for Hispanic, other, and mixed-race students. Hispanic students' visits had a wider

[32]See Eisenberg et al. (2011), Eisenberg et al. (2012) and Miranda et al. (2015).

distribution, possibly due to the diversity of Hispanic students' backgrounds at UofSC. Other and mixed-race students were fewer on campus challenging the precision of estimates.

Class was another significant determinant of the rate of treatment. After the first round of emails, the rate of treatment for freshmen was not significantly different than the rate of treatment for seniors. After the second round of emails, freshmen were about 0.7 percentage points more likely to utilize the counseling services, which was a 13% higher rate of treatment relative to the baseline average, compared to seniors. However, freshmen who utilized the services at least once decreased the number of counseling visits by about 0.24 after the second round of emails. The second round of emails launched when students were typically busier with midterms and class assignments. The stress levels freshmen experienced at that time could have affected their probability of seeking counseling. Seniors who already utilized counseling may have been in greater need of repeated treatment compared to freshmen. For freshmen, high stress levels in college are unprecedented, so any help could make a difference. Seniors who utilized counseling, on the other hand, may have greater underlying issues. Compared to seniors, sophomores did not have a significantly different probability of going to counseling in either round. After both rounds, sophomores who made use of counseling at least once, visited counseling about 0.15 to 0.17 times less (a 10% to 12% decrease relative to the baseline mean) compared to seniors. Similar to the freshmen-seniors comparison, this difference could be attributed to seniors having greater need for treatment and more experience with the on-campus services: seniors may be more familiar, and therefore may have realized the need for continuous treatment. Seniors who used the services may have also been in greater need due to the added stress of graduation, or perhaps they decided to take advantage of the opportunity of accessible mental health care that may not be covered by their insurance post-graduation. Juniors did not have a significantly different rate of treatment compared to seniors. Overall, juniors had more similar behavior to seniors than freshmen and sophomores, which was expected since they were on average closer in age and college progression.

As suspected, honors students had a different rate of treatment compared to the rest of the student body. Honors students were approximately 2 percentage points more likely to go to counseling after both rounds of email, which was an about 40% increase relative to the baseline mean. After the second round of emails, honors students who utilized counseling at least once visited the service 0.16 more times compared to non-honors students. That represented a 12% increase relative to the baseline mean. This result could be explained by the higher stress levels high-achieving students incur as the semester progresses.

5.2 The Effect of Nudging on Utilization of Counseling

Table 6 displays the results from estimating equations 1 and 2 for the first and the second round of counseling visits. Panel A includes the results for the first round of treatment and panel B includes the results for the second round of treatment. The first two columns present the estimates and average marginal effects of the Logit model without college fixed effects. The third and fourth columns present the estimates and average marginal effects of the Poisson model without college fixed effects. The fifth and sixth columns present the estimates and average marginal effects of the Logit model with college fixed effects, and the last two columns present the estimates and average marginal effects of the Poisson with college fixed effects.

In the first round, the nudge did not have any significant effect on the probability of going to counseling or the number of counseling visits for those who made use of the service at least once. Receiving the nudging email in the first round had a minor negative and insignificant effect of about 0.07% relative to the mean levels on the probability of utilizing counseling. Since the number of observations was relatively high, there was enough statistical power to detect a significant effect. However, I could not reject the null hypothesis of a null effect which makes the negative effect almost negligible. Moreover, the nudge sent in the first round of emails had a positive but insignificant effect on the number of visits, for the students who were utilizing counseling, of the magnitude of about 5 percentage points or 0.04 visits.

In the second round, I test whether the difference between receiving and not receiving a second email, on the utilization of counseling. I do so for both the students who received the basic informative email (Reminder (Info Groups)) and those who received the nudging one (Reminder (Nudge Groups)). Then, the difference-in-difference estimate (Nudge x Reminder) shows the effect of the nudge sent in the second round of the intervention. None of these effects were statistically significant in affecting the probability of utilizing counseling. Students who received the second informative email were 0.23 to 0.25 percentage points more likely to make use of counseling compared to students who received the same email in the first round only. Similarly, students who were nudged twice experienced an about 0.4 percentage points increase in the likelihood of making use of counseling after the second email, compared to students who were nudged only once. Most importantly, the nudge in the second round increased the probability of going to counseling by 0.14 to 0.17 percentage points. All three effects are less than 8% relative to mean levels and statistically insignificant at conventional levels.

For students who utilized counseling at least once, receiving the second informative email insignificantly decreased the utilization of counseling by about 8.5 percentage points. This effect was about a 6% decrease relative to mean levels. For students who utilized counseling at least once, receiving the second nudging email significantly increased the utilization of counseling by 0.18 to 0.19 visits. This effect was about a 13% increase relative to mean levels and it was significant at a 5% significance level. The difference-in-difference estimate suggests that the nudge increased the utilization of counseling, for the students you used the services, by 0.24 visits (a 17% increase from the mean). This effect was statistically significant at a 10% significance level.

When estimating the results for the entire student body, the effect of the nudge in the first round did not seem to significantly affect the probability of utilizing counseling or the number of visits for the students who were going to counseling. However, the second round nudge successfully increased the number of visits for students who were already utilizing

the services. Examining further the students who were nudged in the second round and utilized the services, I found that 53% of them had never been to the services in the previous round and 20% had only been there once for a triage appointment. Hence, the higher email engagement may have lead to the greater success of the nudge in the first round compared to the second one. Moreover, the students who ended up going to counseling went repeatedly as a result of nudging. This could be an indication that the students who were nudged successfully were already in need of the services, and all it took for them to repeat treatment was an email with a pro-counseling social norm statement.

5.3 The Effect of Nudging on Utilization of Counseling by Race

Block randomization ensured that racial subgroups were available for analysis. Table 7 displays the effect of the nudge in the first and second round for White, non-White, Black, and Asian students. The first two columns show the estimates and the average marginal effect of the nudge on the probability of going to counseling for White students. The third and fourth columns show the estimates and the average marginal effect of the nudge on the number of counseling visits for White students who went to counseling at least once. The fifth and sixth columns show the estimates and the average marginal effect of the nudge on the probability of going to counseling for non-White students. The seventh and eighth columns show the estimates and the average marginal effect of the nudge on the probability of going to counseling for Black students, and the last two columns show the estimates and the average marginal effect of the nudge on the probability of going to counseling for Asian students. The Poisson model could not be estimated for non-White, Black, and Asian students because very few of them utilized counseling at least once.

In the first round, the nudge slightly decreased the probability of making use of counseling for White students. However, this effect was very small in size, it represented a 7% decrease from the mean level, and it was statistically insignificant even with the large sample of White students. When looking at the White students who utilized counseling at least once, the

nudge increased slightly their use of counseling services in the first round by 0.95 percentage points or about 0.01 visits. This effect was also statistically insignificant.

For White students receiving a second informative email did not significantly increase the probability of going to counseling. However, receiving a second nudging email (compared to receiving only one nudging email in the first round) increased the probability of utilizing counseling by 0.86 percentage points, which was a 17% increase from the baseline levels. This effect was statistically significant at a 5% significance level. The difference-in-difference estimate of the second round of the experiment was not statistically significant at conventional levels, even though it represented a 12% increased on the probability of going to counseling, relative to the mean levels. For White students who utilized the services at least once in the second round, the estimates have similar signs. For White students who utilized counseling, receiving a second informative email did not significantly increase their repeated use of counseling. Receiving the second nudging email compared to only receiving the first one, increased the use of counseling for White students who utilized the service by 0.3 percentage points or 0.2 visits. This effect was statistically significant at a 10% significance level.

On the contrary, non-White, Black, and Asian students were more likely to make use of counseling as a result of the nudge in the first round. After the first round, non-White students, who received the nudging email, were approximately 0.9 percentage points more likely to utilize counseling. This effect represents a 24% increase compared to the average level. Black students were 1.6 percentage points more likely (a 53% increase compared to the average) and Asian students were 1.7 percentage points more likely (a 54% increase compared to the average) to utilize counseling after receiving the first round nudging email. All of these are sizable effects with the effect for Black students being statistically significant at the 5% significance level and the effects for non-White and Asian students being significant at the 10% significance level.

Receiving a second email and/or being nudged did not have a significant effect on the likelihood of going to counseling for racial minorities. For non-White students receiving a

second informative email increased the likelihood of receiving professional help while the opposite was true for Black and Asian students. For non-White and Black students the second round nudge decreased the likelihood of receiving help while it increased it for Asian students. Overall, the nudge in the second round seem to positively impact the probability of going to counseling for Black and Asian students and negatively for non-White students.

The differential effect of nudging on the utilization of counseling could be driven by the needs and barriers of the different on-campus populations. In the first round, White students who were nudged did not experience any change in their rate of treatment. However, White students experienced an increase in the likelihood of receiving help and the utilization of services after they were nudged repeatedly in the second round. This different response to nudging could be explained by the timing of the emails and the circumstances surrounding that timing. White students are the majority at UofSC, therefore the lower email engagement in the first round and the higher email engagement in the second round could be driven by White students. The high email engagement of the second round of emails could be driving the great success of the nudge in that round.

On the other hand, non-White, Black, and Asian students experienced an increase in the likelihood of going to counseling as a result of the nudging email they received in the first round. These racial minorities may have not had the same access, information, and perception regarding stigma as White students. Consequently, the nudge was successful from the very first round in increasing their chances of going to counseling. The immediate need for professional help overpowered the lower email engagement of the first round. In other words, even if non-White, Black, and Asian students read the first round of emails just as much as White students, their greater need outweighed the lower online engagement resulting in a positive and significant effect. However, in the second round, nudging was unsuccessful for non-White, Black, and Asian students. This could be driven by various reasons. Mechanically, there are two treatment groups in the first round and four in the second one, so when analyzing the effects for minority groups the sample size becomes even

smaller in the second round. That leads to lower power and less of a chance in detecting a significant effect. After utilizing counseling because of the first round nudge, students could decide based on their experience whether they needed to visit the service again. The first triage appointment may have not been what students expected, which may have influenced their perception and future use. Moreover, many minority students are working while in college and the second round of emails was sent out at a busier time of the semester, when they might find it harder to schedule an appointment compared to White students. For all of these reasons, it seems that the increase of visits for White students in the second round substituted the visits from minority students in the first round.

It is also worth noting that the estimated results for the entire student body (section 5.2) are primarily driven by the results estimated for White students. The first round insignificant results estimated for the entire student body reflect the ineffectiveness of the nudge for White students. The effect of receiving the second nudging email, compared to receiving only the first one, and the difference-in-difference estimate of the effect of the nudge in the second round on the utilization of counseling for students who used the service was also driven by White students, although it seems to have been reinforced in magnitude and significance by other sub-populations. The insignificance of the effect of receiving the second nudging email, compared to receiving only the first one, on the probability of seeking help for all students, seems to have been influenced by the minority sub-groups that were negatively and insignificantly impacted.

5.4 The Effect of Nudging on Students' Involvement

To investigate whether there were any synergies between receiving mental health care and students' involvement, I tested the effect of nudging on involvement. Table 8 presents the effects of the nudge and the reminder on the probability of going to social events and the wellness and fitness center for the full population. Table 9 presents the effects of the nudge and the reminder on the probability of going to social events by race. Table 10 presents the

effects of the nudge and the reminder on the probability of going to the wellness and fitness center by race.

When looking at the entire student body, the nudge and the reminder did not have a significant effect on involvement. After the first round, nudging decreased the likelihood of attending a social event by 0.22 percentage points or by about 2% relative to the mean. At the same time, receiving the first round nudging email increased the probability of visiting the wellness and fitness center by approximately 0.6 percentage points, or by about 1.5% relative to the mean.

Consistent with the first round results, the second round of emails and nudge did not significantly affect involvement for all students. More specifically, receiving the second informative email insignificantly decreased the probability of going to a social event, and insignificantly increased the probability of going to the wellness and fitness center. Both effects were below 1 percentage point or 3% form the respective mean levels. Similarly, being nudged in the second round insignificantly decreased the probability of attending a social event, and insignificantly increased the probability of going to the wellness and fitness center. Both effects were below 4% relative to the baseline mean levels and statistically insignificant. More importantly, the effect of receiving the nudging email in the second round decreased both the likelihood of going to a social event and the likelihood of going to the wellness and fitness center. Both effects are insignificant and minuscule in magnitude of less than 3% for the baseline means.

Interestingly, nudging had differential effects when looking at students' social involvement by race. White, non-White and Asian students were insignificantly impacted. First round nudging decreased the likelihood of attending a social event by 0.5 percentage points (a 7% decrease relative to the mean) for White students and by 0.5 percentage points (a 9% decrease relative to the mean) for Asian students. For non-White students, nudging in the first round insignificantly increased the likelihood of attending a social event by 0.9 percentage points (a 10% increase relative to the mean). However, for Black students nudging in the first

round increased the likelihood of engaging socially on campus by 2 percentage points or 23% relative to the baseline average. The effect for Black students was statistically significant at a 5% significance level.

In the second round, the effects of receiving a second informative email, a second nudging email, and the difference-in-difference effect of the nudge were statistically insignificant for White, Black and Asian students. For non-White students, the effects of receiving a second informative email and a second nudging email were insignificant while the difference-in-difference effect of the nudge was negative and statistically significant. Nudging decreased the likelihood of socializing by about 3 percentage points or 26% relative to the baseline mean. The effect was statistically significant at a 10% significance level.

When analyzing the effects on the likelihood of visiting the wellness and fitness center by race, none of the first or the second round effects were significant. In the first round, nudging insignificantly increased the likelihood of visiting the wellness and fitness center for White and Black students, and insignificantly decreased the likelihood of visiting the wellness and fitness center for non-White and Asian students. All four effects are lower than 7% relative to their respective mean levels. In the second round, receiving the second informative email insignificantly increased the likelihood of going to the wellness and fitness center for White, non-White, and Black students while it decreased the likelihood of going to the wellness and fitness center for Asian students. All the effects of receiving the second informative email are insignificant and lower than 5% relative to the baseline averages. Receiving the second nudging email increased the likelihood of visiting the wellness and fitness center for White students, and decreased it for all other minority sub-populations. The difference-in-difference estimate of nudging in the second round was negative and insignificant for all sub-populations except for Asians that had a positive yet still insignificant estimate. All the effects of the nudge and receiving the second nudging email are insignificant and lower than 6% relative to the baseline averages.

The differential effect on engagement seemed to be driven by cultural differences. From all

the different sub-populations, Black students, who were more significantly nudged to receive counseling, were also more likely to engage in social activities on campus. Black students sought the help of professionals and the help of the community. A similar effect was not detectable for White students who were not successfully nudged in the first round, or Asian students who typically form groups with other Asian and international students instead of engaging in tractable university activities. This finding also seems to suggest that there are spill-over effects between receiving professional help and creating a support network through on-campus experiences, which can potentially lead to an even more long-lasting impact of nudging.

In the second round of emails, nudging seems to significantly reduce attendance to social events for non-White students. It seems that the reminder email had an insignificantly positive effect, the nudging email had a insignificantly negative effect, and when subtracting the former from the latter, the difference-in-difference estimate becomes more negative and gains some significance. This effect was parallel to the negative but insignificant effect of the nudge on the likelihood of seeking counseling and seems to be driven by Black, and non-Asian students. Social events on campus are organized to help students meet and create friend groups. If non-White students formed successfully their support network in the first round, when they got busier in the second round they might have been less likely to engage in tractable social events on campus.

6 Robustness Checks

In this section I present the results for all services provided at the SHS. Furthermore, I discuss the randomization inference p-values displayed on the result tables, and plot the distributions of the estimates. I also verify the significance of the main results with the use of linear estimations.

6.1 Results on All Services

Estimating the results on the utilization of all services provided at the SHS, I use as the outcome variable counseling, psychiatry, group counseling and coaching student visits.[33] Table 11 displays the results of the block variables on the use of all services. Table 12 shows the effect of the nudge on the use of all services for all students and table 13 includes the effect of the nudge on the use of all services by race. All three tables follow the same format as the ones presented using counseling as the outcome variable.

6.1.1 The Effect of Block Variables on Utilization of All Services

Block variables significantly affected the use of all services similar to the use of counseling only. More specifically, females were about 4 percentage points more likely (a 72% increase relative to the baseline mean) to visit the mental health services after both the first and the second round of emails. This effect was very similar to the one found using counseling visits as the outcome variable. Females who utilized the mental health services at least once visited them less in the first round and more in the second round than males . The signs of both of these effects were similar to the ones found using counseling visits as the outcome variable, although the effect of the first round was insignificant with all services as the outcome variable, and significant with counseling visits as the outcome variable. The second round effect was insignificant regardless of the outcome variable used. When examining all services I added to the number of counseling visits three more types of services: psychiatry, coaching, and group therapy. Repeated visits in coaching and group therapy were not formally scheduled between a student and a therapist like counseling and psychiatry sessions which could influence students' need, commitment as well as their reaction to the nudge.

[33] I could not estimate the effect of the nudge separately on psychiatry, group counseling and coaching because there were not enough students who went to these services separately. The most popular one that could be studied by itself was counseling. Counseling was also important to be looked at separately for students who received mental health care for the first time as their first triage appointment was considered to be a counseling visit.

The use of all mental health services for different racial and ethnic minorities was also similar to the effects on the utilization of counseling. In both rounds, Black students were from 1.9 to 2.4 percentage points less likely (a 37% to 40% decrease relative to the baseline mean) to request mental health care compared to their White counterparts. This finding underlines the one found using only counseling as the outcome variable. Unlike previous findings, the results on the number of visits for Black students who utilized the services at least once were not statistically significant. Similar to previous findings regarding counseling, Asians were approximately 2.4 percentage points less likely (a 48% decrease relative to the mean levels) to use the services after the first round of emails and 1.7 percentage points less likely (a 28% decrease relative to the mean levels) to use the services after the second round of emails. The effects on the number of services utilized by Asians that used them at least once were statistically insignificant. Similar to the results of the previous section the effects for Hispanic, other and mixed-race students were not statistically significant.

Class remained a significant determinant of the rate of treatment when using all services as the outcome variable. After the first round of emails, freshmen were 0.63 percentage points less likely (a 12.6% decrease relative to the mean levels) to make use of the services. This effect was stronger and statistically significant compared to the one using counseling as the outcome variable. Freshmen in the beginning of the semester may not have necessarily known about all of the other services offered on campus or they may have been more hesitant in trying them compared to seniors. After the second round of emails, freshmen were less likely to visit the services but the effect was not statistically significant. Hence, freshmen near the mid-end of the semester could have been significantly more likely to go to counseling but not to all of the other services offered. After the second round of emails, freshmen who utilized the services at least once went about 0.2 times less, compared to seniors. This statistically significant result parallels the one using counseling as the outcome variable. After the first round of visits, sophomores were almost 0.9 percentage points less likely (an 18% decrease relative to the mean levels) to visit the services, compared to seniors. This effect was not

significant when using the number of counseling visits as the outcome variable, so sophomores were even less inclined to use all services compared to counseling only. After the first round of visits, sophomores who utilized the services visited them 0.21 times less (an 11% decrease relative to the mean levels) compared to seniors. This effect parallels the one found using counseling as the outcome variable. After the second round of visits, sophomores did not have a significantly different rate of treatment compared to seniors. Hence, sophomores that utilized counseling used it more often compared to seniors, but that was not the case for sophomores that utilized a service at least one. Similar to previous findings, juniors did not have a significantly different rate of treatment compared to seniors.

The effects for honors students were very similar regardless of the outcome variable used. After the first and second round of emails, honors students had a 2.4 percentage points higher likelihood of going to counseling. That was a sizable and significant increase of about 49% from the baseline average. After the second round of visits, honors students who utilized the services, visited them 0.3 times more (an 21% increase relative to mean levels) compared to non-honors students.

6.1.2 The Effect of Nudging on Utilization of All Services

The effects of nudging on the utilization of all services are comparable to those found on the utilization of counseling only. In the first round, receiving the nudging email had a minuscule negative and widely insignificant effect on the likelihood of utilizing a service. This result was aligned with the corresponding effect on the probability of going to counseling. Receiving the nudging email in the first round also caused a small insignificant increase on the number of services utilized by individuals who made use of a service at least once. The corresponding effect was also positive and insignificant when using the number of counseling visits as the outcome variable. Hence, the nudge impacted somewhat negatively the probability of receiving professional help and somewhat negatively the utilization of services for individuals who made use of a service with none of these effects being statistically significant.

In the second round of the intervention, none of the variables that indicated receiving a second informative or a nudging email significantly affected the probability of making use of a service. This finding if similar to the main results that used counseling as the outcome variable. When examining the effects for those who used the services, receiving a second informative email (compared to not receiving a second informative email) and receiving a second nudging email (compared to not receiving a second nudging email) had also no significant effect on the use of the services. The former effect was similar to the effect on the use of counseling services only, while the latter was statistically significant on the use of counseling services. Therefore, it seems that the second nudging email mostly impacted the use of counseling but not the use of other services. Since the first appointment with the services was recorded as a counseling appointment, and nudged students were more inclined to utilize counseling over other services, this finding provides another indication that the nudge impacted the students who did not have any prior experience with the services but when nudged they received treatment repeatedly.

The difference-in-difference estimate of the effect of the second round nudge on the number of visits for students, who utilized the services, was statistically significant at a 5% significance level, similar to the estimated result using counseling visits as the dependent variable. Nudging increased the use of services by 0.4 visits (a 25% increase from the baseline average). This effect was statistically significant at a 5% significance level. The respective effect on the use of counseling services was smaller in magnitude and statistically significant at the 10% significance level. Hence, the difference-in-difference estimate was reinforced when combining all services in the outcome.

6.1.3 The Effect of Nudging on Utilization of All Services by Race

The analysis of the effect of nudging on the utilization of all services by race entail similar results to those on the utilization of counseling only. In the first round, the nudge slightly decreased the probability of going to any service for White students. However, this effect

was very small in magnitude (0.2 percentage points) and it was statistically insignificant. This finding was similar to the one found using counseling visits as the outcome of interest both in terms of sign and in terms of significance. When looking at White students who utilized the services at least once the nudge insignificantly decreased the number of services they used in the first round by 6 percentage points or by 0.08 visits. This effect was similar in sign and still insignificant, compared to the effect found using counseling as the dependent variable.

Similar to the main findings, sending a second informative email to White students did not significantly increase the likelihood of utilizing the services. However, sending a second nudging email (compared to not sending a second nudging email) increased the probability of utilizing the services by 1 percentage point which was a 20% increase from the average levels. This effect was similar in magnitude to the effect on the likelihood of utilizing counseling and was also statistically significant at a 5% significance level. Similar to the main results, the difference-in-difference coefficient of the second round of the experiment did not significantly affect the likelihood of receiving help. When examining the effects for White students who utilized the services, the results are strengthened in terms of magnitude and significance when including all services in the outcome. Receiving the second informative email decreased the number of services utilized for White students, who made use of them, by 0.2 visits (which was a 13% decrease relative to the mean levels). This effect was statistically significant at a 10% significance level. When examining this finding further, it seems that white students who received the second informative email visited counseling, psychiatry and coaching (on average) a few times less, and group counseling a few times more, compared to than those who received only the first but not the second informative email. Hence, receivers of the second informative email substituted other services with group counseling. Receiving the second nudging email increased the number of services utilized for White students, who made use of them, by 0.3 visits (which represents a 15% increase relative to the average). This effect was statistically significant at a 5% significance level. The second round nudge increased the

use of services for White students, who made use of them, by 0.5 services (a 29% increase relative to the mean). This was a sizable and significant effect at a 1% significance level. Generally, White students, who utilized the services, seemed to be impacted differently depending on whether they received a second informative or nudging email. Those who received the second informative email seem to have substituted other services with group counseling, and experiencing a lower rate of treatment overall, while those who received the second informative email utilized more of all services. The absence of the nudging statement may have shifted students' attention to all services provided, which could overwhelm their decision to seek help. The nudging statement could be perceived as hinting at receiving counseling, increasing the use of that service. It might have also nudged repeated treatment as it refers to how useful it was proven for the majority of students.

Similar to the main results on the use of counseling, non-White, Black, and Asian students were more likely to make use of all services as a result of the nudge in the first round. After the first round, non-White students, who received the nudging email, were approximately 0.9 percentage points more likely to utilize the services. This effect represents an 18% increase compared to the average level. Black students were 2.1 percentage points more likely (a 53% increase compared to the average) and Asian students were 1.8 percentage points more likely (a 45% increase compared to the average) to utilize the services after receiving the first round nudging email. All were sizable effects, similar to the effects found on counseling, with the effect for Black students being statistically significant at the 5% significance level, the effect for Asian students being significant at the 10% significance level, and the effect for non-White students being marginally insignificant.

The second round results for racial minorities on the utilization of all services were statistically insignificant resembling the insignificance of the effects on counseling visits. All effects were very small in magnitude, as well. This was expected since these smaller groups had to be separated into four treatment groups in the second round (instead of two groups in the first round), reducing the sample size and increasing the variation.

6.2 Randomization Inference

Randomization inference can be used to test how extreme the distribution of the average treatment effect of the implemented randomization is. It considers what would have happened under a number of possible random assignments, and tests how unusual the effect found in the experiment at hand is. This method is valuable primarily when outcomes are skewed, subject pools are small, or the method of assignment is complicated (Gerber and Green (2012)). In this paper, the outcome of receiving professional help is highly skewed and its occurrence is so rare that randomization inference p-values can be used as a robustness check to the original estimated p-values. To calculate the p-values using randomization inference, I re-assigned treatment 1,000 times, using the exact same block randomization process used in the implemented treatment.

Randomization inference p-values are included in the last row of every table of results ("RI test p-value"). In the first round, the p-value corresponds to the effect of the nudge, and in the second round to the difference-in-difference estimate (Nudge x Reminder). I also graphed the distribution of the average treatment effects along with the one found under the implemented randomization for ease of interpretation in figures 5 through 8. Figure 5 with panels (a) and (b) shows how common the effect of the first round nudge was on the probability of going to counseling and how unique the effect of the second round nudge was on the number of visits, for individuals that made use of the service at least once. Figure 6 with panels (a) and (b) shows how common the effect of the second round nudge (difference-in-difference estimate) was on the probability of going to counseling and how unique the effect of the second round nudge was on the number of visits, for individuals that made use of the service at least once. Figure 7 plots the effect of the nudge in the first round and figure 8 plots the effect of the nudge (difference-in-difference estimate) in the second round. Panels (a) and (b) in figures 7 and 8 refer to the effects on the likelihood and use of counseling respectively, restricting the sample to White students. Panels (c), (d) and (e) refer to the effect on the probability of receiving help restricting the sample to non-White, Black and

Asian students, respectively.

Randomization inference p-values verify the significance of the results. Notably, the second round difference-in-difference estimate in table 6 remains significant at a 10% significance level. Significance is also verified for the effect of the first-round nudge for Non-White, Black and Asian students in table 7. Randomization inference also verifies that the difference-in-difference estimate of the effect of the nudge in the second round for White students is indeed marginally insignificant. The significance of results using all services as the outcome variable are also verified by randomization inference in tables 12 and 13. In table 12, the difference-in-difference estimate of the effect of the nudge in the second round remains statistically significant at a 5% significance level. In table 13, the effect of the nudge in the first round for non-White students is marginally insignificant, for Black students remains significant at a 1% significance level and for Asian students at a 5% significance level. Also in table 13, randomization inference verifies that the difference-in-difference estimate of the effect of the nudge in the second round for White students is statistically significant at a 1% significance level.

Reviewing figures 5 and 6, it is evident that the overall effect of the first round nudge on the rate of counseling treatment is very common, while the effect of the second round nudge is somewhat unusual for the use of services by students who made utilized them. Figures 7 and 8 provide additional support that the effect of the nudge in the first round for non-White, Black and Asian and the difference-in-difference estimate of the effect of the nudge in the second round for White students who utilized the services are relatively extreme. Randomization inference indicates that the estimated effects are not a product of the implemented randomization but, direct results of the treatment.

6.3 Linear Estimations

Table 14 presents the estimates of the main results using naive least squares instead of the logit and poisson estimations. The first column presents the effect of the treatment on the

probability of receiving counseling for the full sample. The second column presents the effect of the treatment on the number of services utilized by students who made use of counseling at least once. The third column presents the effect of the treatment on the probability of receiving counseling for White students. The forth column presents the effect of the treatment on the number of services utilized by White students who made use of counseling at least once. The fifth column presents the effect of the treatment on the probability of receiving counseling for non-White students. The sixth column presents the effect of the treatment on the probability of receiving counseling for Black students. The seventh column presents the effect of the treatment on the probability of receiving counseling for Asian students.

In the first round, analyzing the full student population shows that nudging does not have any significant effect on the probability or the number of counseling visits utilized (by students who used the counseling). An insignificant effect is also found when analyzing the effect for White students. However, nudging increased the probability of receiving help by 0.9 percentage point for non-White (that was a 24% increase from the average), and 2 percentage points for Black and Asian students (both of these effects represent a 53% increase from their averages.). All three effects are almost identical in magnitude and significance with the effect estimated using logistic regressions.

In the second round, the effects of receiving a second informative email, a second nudging email and the overall effect of the nudge on the probability of receiving counseling are not statistically significant when analyzing the entire student population. When examining the population of students who made use of the services, receiving the second informative email had a minor and insignificant effect in the use of counseling for the students that utilized the services. However, receiving the second nudging email (compared to not receiving it) significantly increased the number of counseling services by 0.1 visits (or by 8% increase relative to the mean) for students who were making use of them. As a result, nudging in the second round of emails significantly increased the use of services by 0.2 visits (that

was an 11% increase form the mean) for the students who utilized them. These results verify the ones found using the poisson specification. Moreover, the results estimated for the full population seem to primarily by White students. Receiving the second nudging email (compared to not receiving it) significantly increased White students' likelihood of going to counseling by 1 percentage point (a 17% increase relative to the mean). Receiving the second nudging email (compared to not receiving it) also significantly increased White students' number of counseling visits by 0.1 visits (a 9% increase relative to the mean). Receiving the second informative email did not significantly impact the rate of receiving counseling. The difference-in-difference effect of the nudge was insignificant for the likelihood of receiving counseling and marginally insignificant for the number of counseling visits received for the students that visited the services. None of the effects of receiving a second informative email, a second nudging email or the overall effect of the nudge are statistically significant for minorities.

As expected, the linear specifications verified the main results. Black and Asian students were impacted significantly by the nudge in the first round while White students were impacted in the second round of the nudge. The difference-in-difference effect of the nudge on receiving professional help for the students who went to counseling was reinforced by other sub-populations.

7 Conclusion

In this section, I summarize the results and the implications they entail, discuss the cost effectiveness of the implemented intervention, and present possible future work. Summarizing, this is the first study, to the best of my knowledge, that used a descriptive social norm statement to improve the utilization of counseling services for college students. By using administrative data on the use of mental health services and by implementing a randomized control trial, I found that nudging impacted racial minorities the most in the first round of

the implementation regardless of the lower email engagement. On average, 1.7 more Black and Asian students received help as a result of the nudge.Black students specifically did not only experience an increase in the number of services they utilized, but also a significant increase in their social engagement on campus. This result is indicative of the high need of treatment among these populations that counteracted the lower impact of the email campaign. At the same time, there seem to be significant synergies between mental health outcomes and staff-led, fee-based social events organized on campus. Black students' higher engagement in social activities could also lead to a higher impact of the nudge, goes beyond just receiving professional help. In the second round of the intervention and at a busier time in the semester, nudging impacted White students the most, with their counseling appointments substituting those booked by minority students in the first round. This could be the result of minority students being busier and/or finding other mechanisms to cope with their mental health services, as well as the higher email engagement that could be primarily driven by White students.

The results of this study suggest that nudging could have some positive impact on the utilization of services, and hence, it should be considered among other traditional outreach activities. More importantly, a pro-counseling descriptive nudge could target some of the most vulnerable populations on campus that seek mental health care primarily on campus.[34]. Most of the existing interventions in the literature either do not have this impact or their differential impact has not been investigated yet.ot all colleges are in the business of providing mental health care. Even the universities that currently do are examining th

In 2021, SAMHSA announced the distribution of $3 billion in the American Rescue Plan funding for its mental health and substance use block grant programs. This was the largest aggregate amount of funding to date.[35] Grants were provided to various agencies to prevent and treat addictive and mental disorders and to suggest public campaigns, system reform,

[34]American College Health Association–National College Health Assessment, Undergraduate Student Reference Group , Executive Summary, Fall 2019, p.5

[35]The announcement of the Department of Health and Human Resources.

policy and program analysis.[36] In 2021, efforts are being focused on minorities that were heavily impacted by COVID-19. UofSC received over $300,000 in grant funds from 2018 to 2021 from SAMHSA to deepen the mental health infrastructure, increase access to mental health, and change the mental health culture on campus by decreasing barriers to care and by, focusing on at-risk individuals and individuals who do not utilize the services.[37] In examining the most efficient allocation of these resources, college officials need to take into account the relative effectiveness of nudges compared to traditional policy tools. Benartzi et al. (2017) suggested that the impact of nudges is often greater on a cost-adjusted basis than that of traditional tools. To evaluate this claim, officials should compare the effect of other traditional outreach activities with that of a nudge, correcting for the implementation costs.

A nudging email campaign could cost anywhere from a cent to $15.19 which is the average hourly rate that a graduate research assistant would make in the US to track and assess the impact of the campaign.[38] The exact cost would depend on the level of assessment needed. The average hourly wage of a director of communications in the US is $36.81.[39] With some back of the envelope calculations, all other traditional efforts should have at least 2.4 times the impact of nudging to justify their cost. In terms of the impact on minorities, traditional outreach efforts should result in approximately 4.3 more visits or about a 120% increase in the rate of treatment for Black and Asian students.[40]

This paper lacks information on students' health insurance plans. In future work, it will be interesting to investigate the use of services by the type of health insurance plan. The Student Health Insurance Plan at UofSC is the only one in-network. With this plan, students

[36]SAMHSA's budget can be found here.

[37]The SAMHSA website lists all grants by state.

[38]Find the average hourly wage of a graduate research assistant in the US in 2021 here.

[39]Find the average hourly wage of a director of communications in the US in 2021 here.

[40]Traditional efforts should have $\frac{36.18}{15.19} = 2.4$ times the impact of nudging based on costs. The effect of the nudge is an increase of 1.8 visits for Black and Asian students (based on the difference of visits for those who were and were not nudged in the first round) or a 53% increase for Black and a 54% increase for White students (based on the coefficient estimates). Therefore, traditional effects should result a $2.4 \cdot 1.8 = 4.32$ more visits or and increase of $2.4 \cdot 53 = 127.2\%$ to match the effect of the nudge.

have free access to coaching, group therapy, and the first 10 counseling sessions, and need only pay a small fee for psychiatry visits. However, some services may incur out-of-network costs for students who waive the Student Health Insurance Plan. If minority students in this study relied more on the Student Health Insurance Plan, then that might be another reason why the nudge was more effective for them. During the COVID-19 pandemic, access has been even more questionable, as out-of-state students who moved back with their parents struggled to get telehealth appointments covered by their insurance.

Another angle that is worth further investigation is the effect of nudging on students' academic success. The intervention in this paper occurred just before the COVID-19 outbreak in the US which impacted data collection and further analysis. Moreover, students at higher risk of mental health issues could have different access to treatment or different response to the pandemic altogether which would affect the results if those were to be estimated. Future work should account and model these differences to provide unbiased causal estimates.

All in all, there is a great need for mental health care that is not being matched with efforts to lower barriers and perceived stigmatization. Nudging is a promising intervention tool for bettering college student mental health, especially for minorities, and deserves further exploration by researchers in the helping professions.

References

Allcott, H. (2011). Social norms and energy conservation. *Journal of Public Economics 95*(9-10), 1082–1095.

Allcott, H. and T. Rogers (2014). The short-run and long-run effects of behavioral interventions: Experimental evidence from energy conservation. *American Economic Review 104*(10), 3003–37.

Asch, S. E. (1956). Studies of independence and conformity: I. a minority of one against a unanimous majority. *Psychological monographs: General and applied 70*(9), 1.

Aseltine, R. H., A. James, E. A. Schilling, and J. Glanovsky (2007). Evaluating the sos suicide prevention program: a replication and extension. *BMC Public Health 7*(1), 1–7.

Aseltine Jr, R. H. and R. DeMartino (2004). An outcome evaluation of the sos suicide prevention program. *American Journal of Public Health 94*(3), 446–451.

Ayres, I., S. Raseman, and A. Shih (2013). Evidence from two large field experiments that peer comparison feedback can reduce residential energy usage. *The Journal of Law, Economics, and Organization 29*(5), 992–1022.

Bauer, B. W., R. P. Tucker, and D. W. Capron (2019). A nudge in a new direction: integrating behavioral economic strategies into suicide prevention work. *Clinical Psychological Science 7*(3), 612–620.

Bean, G. and K. M. Baber (2011). Connect: An effective community-based youth suicide prevention program. *Suicide and Life-Threatening Behavior 41*(1), 87–97.

Bellatin, P., M. W. Silva, C. Bustin, M. Bustelo, and N. Hidalgo (2021). Behavioral insights and gender-based violence prevention: Evidence from a facebook trial in honduras. *Behavioral Economics Guide 2021*.

Benartzi, S., J. Beshears, K. L. Milkman, C. R. Sunstein, R. H. Thaler, M. Shankar, W. Tucker-Ray, W. J. Congdon, and S. Galing (2017). Should governments invest more in nudging? *Psychological Science 28*(8), 1041–1055.

Bhalla, R., S. Ramakrishnan, P. G, and N. Marwaha (2021). Nudging to improve the timely payment of loans: Results of a natural field experiment. *Behavioral Economics Guide 2021*.

Bicchieri, C. and E. Dimant (2019). Nudging with care: The risks and benefits of social information. *Public Choice*, 1–22.

Blanco, C., M. Okuda, C. Wright, D. S. Hasin, B. F. Grant, S.-M. Liu, and M. Olfson (2008). Mental health of college students and their non–college-attending peers: Results from the national epidemiologic study on alcohol and related conditions. *Archives of General Psychiatry 65*(12), 1429–1437.

Borsari, B. and K. B. Carey (2003). Descriptive and injunctive norms in college drinking: a meta-analytic integration. *Journal of Studies on Alcohol 64*(3), 331–341.

Brown, R. P., M. Imura, and L. Mayeux (2014). Honor and the stigma of mental healthcare. *Personality and Social Psychology Bulletin 40*(9), 1119–1131.

Bucher, T., C. Collins, M. E. Rollo, T. A. McCaffrey, N. De Vlieger, D. Van der Bend, H. Truby, and F. J. Perez-Cueto (2016). Nudging consumers towards healthier choices: a systematic review of positional influences on food choice. *British Journal of Nutrition 115*(12), 2252–2263.

Cialdini, R. B. (2003). Crafting normative messages to protect the environment. *Current Directions in Psychological Science 12*(4), 105–109.

Cialdini, R. B., R. R. Reno, and C. A. Kallgren (1990). A focus theory of normative conduct:

Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology 58*(6), 1015.

Cleofas, J. V. (2020). Student involvement, mental health and quality of life of college students in a selected university in manila, philippines. *International Journal of Adolescence and Youth 25*(1), 435–447.

Coleman, S. (1996). The minnesota income tax compliance experiment: State tax results.

Cusimano, M. D. and M. Sameem (2011). The effectiveness of middle and high school-based suicide prevention programmes for adolescents: a systematic review. *Injury Prevention 17*(1), 43–49.

Czajkowski, M., K. Zagórska, and N. Hanley (2019). Social norm nudging and preferences for household recycling. *Resource and Energy Economics 58*, 101110.

Czyz, E. K., A. G. Horwitz, D. Eisenberg, A. Kramer, and C. A. King (2013). Self-reported barriers to professional help seeking among college students at elevated risk for suicide. *Journal of American College Health 61*(7), 398–406.

Demyan, A. L. and T. Anderson (2012). Effects of a brief media intervention on expectations, attitudes, and intentions of mental health help seeking. *Journal of Counseling Psychology 59*(2), 222.

Drum, D. J., C. Brownson, A. Burton Denmark, and S. E. Smith (2009). New data on the nature of suicidal crises in college students: Shifting the paradigm. *Professional Psychology: Research and Practice 40*(3), 213.

Dupas, P. (2011). Health behavior in developing countries. *Annual Review of Economics 3*(1), 425–449.

Eisenberg, D., J. Hunt, and N. Speer (2012). Help seeking for mental health on college

campuses: Review of evidence and next steps for research and practice. *Harvard Review of Psychiatry 20*(4), 222–232.

Eisenberg, D., J. Hunt, N. Speer, and K. Zivin (2011). Mental health service utilization among college students in the united states. *The Journal of Nervous and Mental Disease 199*(5), 301–308.

Fink, J. E. (2014). Flourishing: Exploring predictors of mental health within the college environment. *Journal of American College Health 62*(6), 380–388.

Freedenthal, S. (2010). Adolescent help-seeking and the yellow ribbon suicide prevention program: an evaluation. *Suicide and Life-Threatening Behavior 40*(6), 628–639.

Friedlander, J. and P. MacDougall (1992). Achieving student success through student involvement. *Community College Review 20*(1), 20–28.

Gallagher, R. P. (2006). National survey of counseling center directors 2005.

Gerber, A. S. and D. P. Green (2012). *Field experiments: Design, analysis, and interpretation*. WW Norton.

Giné, X., D. Karlan, and J. Zinman (2010). Put your money where your butt is: a commitment contract for smoking cessation. *American Economic Journal: Applied Economics 2*(4), 213–35.

Gneezy, U., S. Meier, and P. Rey-Biel (2011). When and why incentives (don't) work to modify behavior. *Journal of Economic Perspectives 25*(4), 191–210.

Grant-Vallone, E., K. Reid, C. Umali, and E. Pohlert (2003). An analysis of the effects of self-esteem, social support, and participation in student support services on students' adjustment and commitment to college. *Journal of College Student Retention: Research, Theory & Practice 5*(3), 255–274.

Haas, A., B. Koestner, J. Rosenberg, D. Moore, S. J. Garlow, J. Sedway, L. Nicholas, H. Hendin, J. J. Mann, and C. B. Nemeroff (2008). An interactive web-based method of outreach to college students at risk for suicide. *Journal of American College Health 57*(1), 15–22.

Hallsworth, M., T. Chadborn, A. Sallis, M. Sanders, D. Berry, F. Greaves, L. Clements, and S. C. Davies (2016). Provision of social norm feedback to high prescribers of antibiotics in general practice: a pragmatic national randomised controlled trial. *The Lancet 387*(10029), 1743–1752.

Hallsworth, M., J. A. List, R. D. Metcalfe, and I. Vlaev (2017). The behavioralist as tax collector: Using natural field experiments to enhance tax compliance. *Journal of Public Economics 148*, 14–31.

Herman, S., O. G. Archambeau, A. N. Deliramich, B. S. Kim, P. H. Chiu, and B. C. Frueh (2011). Depressive symptoms and mental health treatment in an ethnoracially diverse college student sample. *Journal of American College Health 59*(8), 715–720.

Hom, M. A., I. H. Stanley, and T. E. Joiner Jr (2015). Evaluating factors and interventions that influence help-seeking and mental health service utilization among suicidal individuals: A review of the literature. *Clinical Psychology Review 40*, 28–39.

Hummel, D. and A. Maedche (2019). How effective is nudging? a quantitative review on the effect sizes and limits of empirical nudging studies. *Journal of Behavioral and Experimental Economics 80*, 47–58.

Kalafat, J. and M. Elias (1994). An evaluation of a school-based suicide awareness intervention. *Suicide and Life-Threatening Behavior 24*(3), 224–233.

Ketchen Lipson, S., S. M. Gaddis, J. Heinze, K. Beck, and D. Eisenberg (2015). Variations in student mental health and treatment utilization across us colleges and universities. *Journal of American College Health 63*(6), 388–396.

Keyes, C. L., D. Eisenberg, G. S. Perry, S. R. Dube, K. Kroenke, and S. S. Dhingra (2012). The relationship of level of positive mental health with current mental disorders in predicting suicidal behavior and academic impairment in college students. *Journal of American College Health 60*(2), 126–133.

King, C. A., D. Eisenberg, K. Zheng, E. Czyz, A. Kramer, A. Horwitz, and S. Chermack (2015). Online suicide risk screening and intervention with college students: A pilot randomized controlled trial. *Journal of Consulting and Clinical Psychology 83*(3), 630.

King, K. A., C. M. Strunk, and M. T. Sorter (2011). Preliminary effectiveness of surviving the teens® suicide prevention and depression awareness program on adolescents' suicidality and self-efficacy in performing help-seeking behaviors. *Journal of School Health 81*(9), 581–590.

Kisch, J., E. V. Leino, and M. M. Silverman (2005). Aspects of suicidal behavior, depression, and treatment in college students: Results from the spring 2000 national college health assessment survey. *Suicide and Life-Threatening Behavior 35*(1), 3–13.

Lipson, S. K., E. G. Lattie, and D. Eisenberg (2019). Increased rates of mental health service utilization by us college students: 10-year population-level trends (2007–2017). *Psychiatric Services 70*(1), 60–63.

Loschelder, D. D., H. Siepelmeyer, D. Fischer, and J. A. Rubel (2019). Dynamic norms drive sustainable consumption: Norm-based nudging helps café customers to avoid disposable to-go-cups. *Journal of Economic Psychology 75*, 102146.

Masuda, A., P. L. Anderson, M. P. Twohig, A. B. Feinstein, Y.-Y. Chou, J. W. Wendell, and A. R. Stormo (2009). Help-seeking experiences and attitudes among african american, asian american, and european american college students. *International Journal for the Advancement of Counselling 31*(3), 168–180.

Miranda, R., A. Soffer, L. Polanco-Roman, A. Wheeler, and A. Moore (2015). Mental health treatment barriers among racial/ethnic minority versus white young adults 6 months after intake at a college counseling center. *Journal of American College Health 63*(5), 291–298.

Mollen, S., R. N. Rimal, R. A. Ruiter, and G. Kok (2013). Healthy and unhealthy social norms and food selection. findings from a field-experiment. *Appetite 65*, 83–89.

Moutier, C., W. Norcross, P. Jong, M. Norman, B. Kirby, T. McGuire, and S. Zisook (2012). The suicide prevention and depression awareness program at the university of california, san diego school of medicine. *Academic Medicine 87*(3), 320–326.

Perkins, H. W. (2002). Social norms and the prevention of alcohol misuse in collegiate contexts. *Journal of Studies on Alcohol* (14), 164–172.

Pinfold, V., H. Toulmin, G. Thornicroft, P. Huxley, P. Farmer, and T. Graham (2003). Reducing psychiatric stigma and discrimination: evaluation of educational interventions in uk secondary schools. *The British Journal of Psychiatry 182*(4), 342–346.

Purswell, K. E., A. Yazedjian, and M. L. Toews (2008). Students' intentions and social support as predictors of self-reported academic behaviors: A comparison of first-and continuing-generation college students. *Journal of College Student Retention: Research, Theory & Practice 10*(2), 191–206.

Reese, G., K. Loew, and G. Steffgen (2014). A towel less: Social norms enhance pro-environmental behavior in hotels. *The Journal of Social Psychology 154*(2), 97–100.

Sanders, M. (2017). Social influences on charitable giving in the workplace. *Journal of Behavioral and Experimental Economics 66*, 129–136.

Schultz, P. W. (1999). Changing behavior with normative feedback interventions: A field experiment on curbside recycling. *Basic and Applied Social Psychology 21*(1), 25–36.

Schultz, W. P., A. M. Khazian, and A. C. Zaleski (2008). Using normative social influence to promote conservation among hotel guests. *Social Influence 3*(1), 4–23.

Shang, J. and R. Croson (2009). A field experiment in charitable contribution: The impact of social information on the voluntary provision of public goods. *The Economic Journal 119*(540), 1422–1439.

Silva, A. and P. John (2017). Social norms don't always work: An experiment to encourage more efficient fees collection for students. *Plos one 12*(5), e0177354.

Thaler, R. H. and C. R. Sunstein (2008). Nudge: Improving decisions about health, wealth, and happiness.

Thornicroft, G., N. Mehta, S. Clement, S. Evans-Lacko, M. Doherty, D. Rose, M. Koschorke, R. Shidhaye, C. O'Reilly, and C. Henderson (2016). Evidence for effective interventions to reduce mental-health-related stigma and discrimination. *The Lancet 387*(10023), 1123–1132.

Tversky, A. and D. Kahneman (1981). The framing of decisions and the psychology of choice. *Science 211*(4481), 453–458.

Wu, L.-T., D. J. Pilowsky, W. E. Schlenger, and D. Hasin (2007). Alcohol use disorders and the use of treatment services among college-age young adults. *Psychiatric Services 58*(2), 192–200.

Wyman, P. A., C. H. Brown, J. Inman, W. Cross, K. Schmeelk-Cone, J. Guo, and J. B. Pena (2008). Randomized trial of a gatekeeper program for suicide prevention: 1-year impact on secondary school staff. *Journal of Consulting and Clinical Psychology 76*(1), 104.

Wyman, P. A., C. H. Brown, M. LoMurray, K. Schmeelk-Cone, M. Petrova, Q. Yu, E. Walsh, X. Tu, and W. Wang (2010). An outcome evaluation of the sources of strength suicide

prevention program delivered by adolescent peer leaders in high schools. *American Journal of Public Health 100*(9), 1653–1661.

Figures

Figure 1: Control E-mail

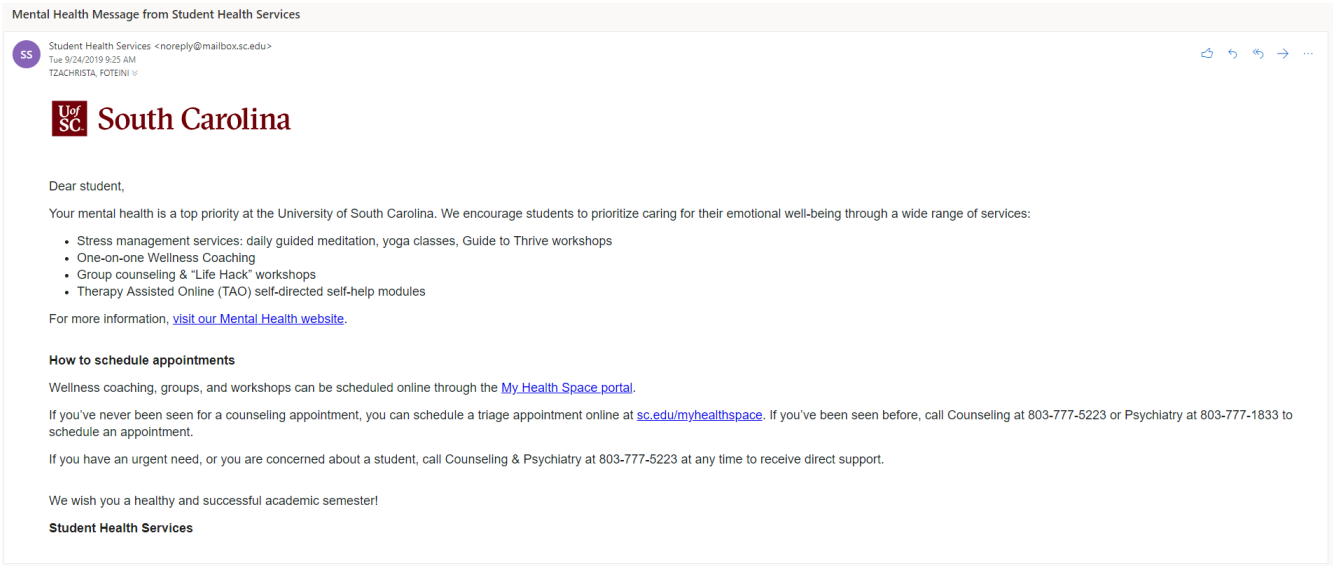


Figure 2: Treatment E-mail

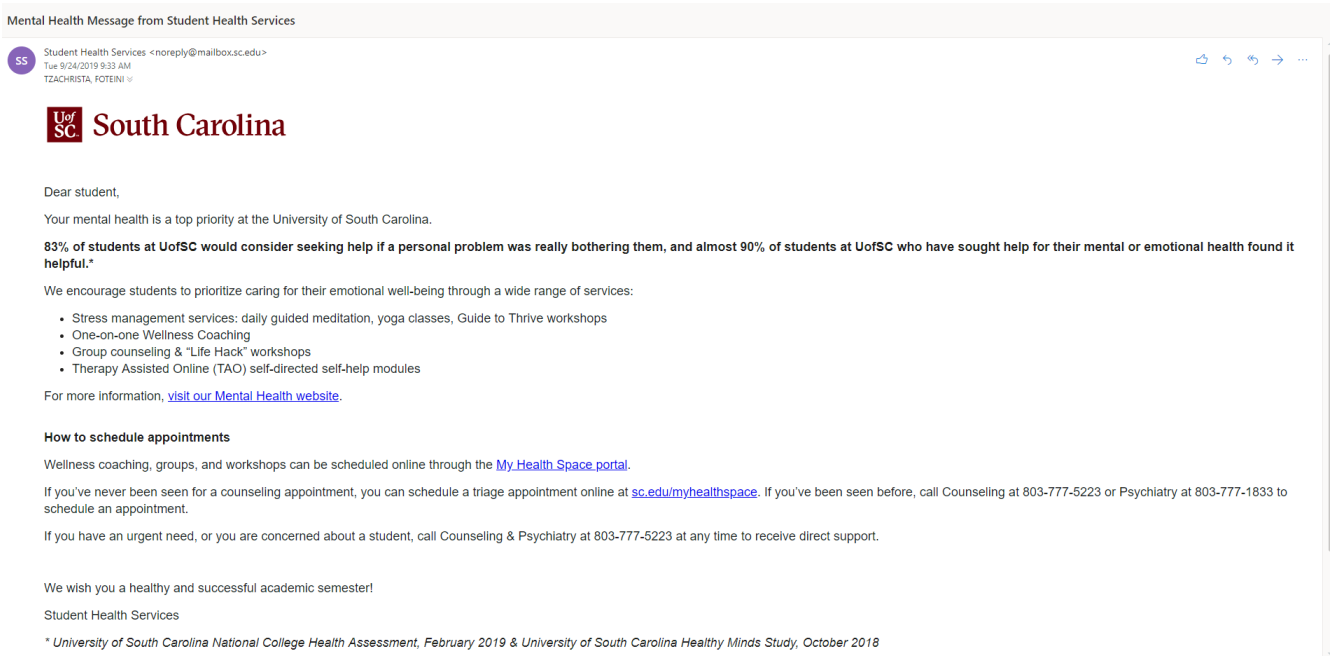
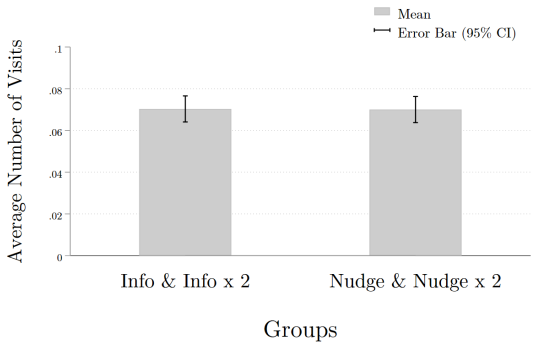


Figure 3: Average Number of Counseling Visits

(a) First Round



(b) Second Round

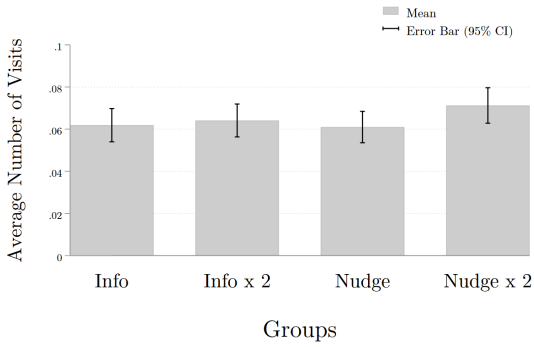
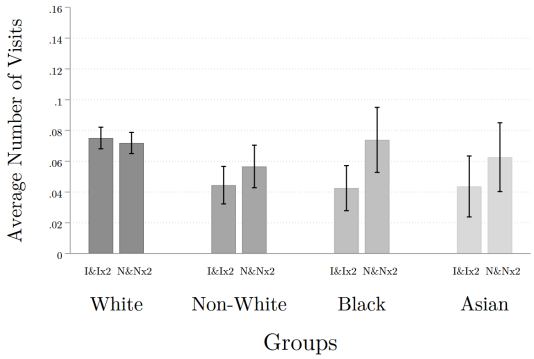


Figure 4: Average Number of Counseling Visits by Race

(a) First Round



(b) Second Round

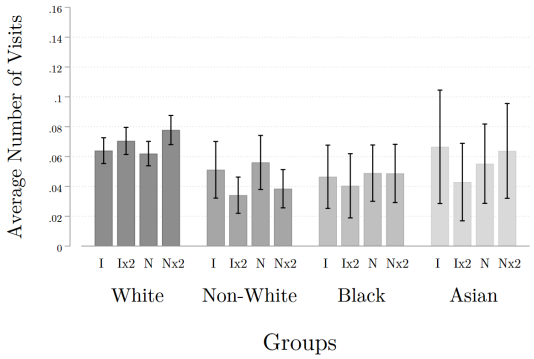
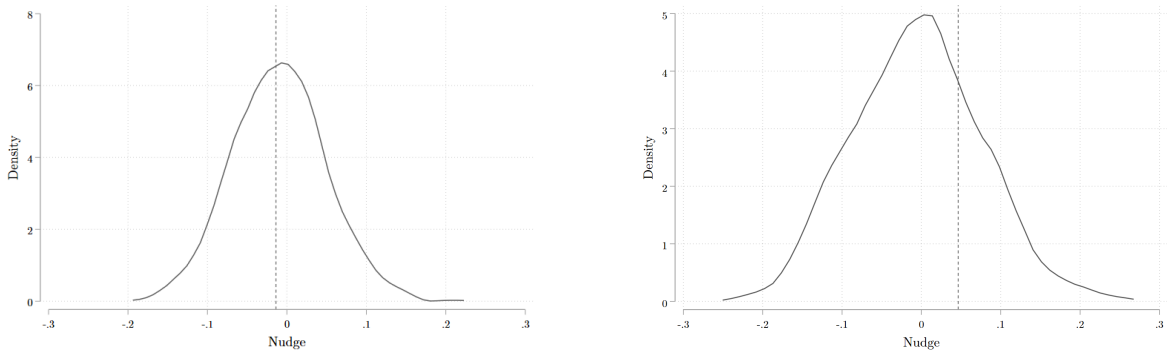


Figure 5: Nudge Estimate Densities on Counseling (First Round)

(a) Logit Model

(b) Poisson Model

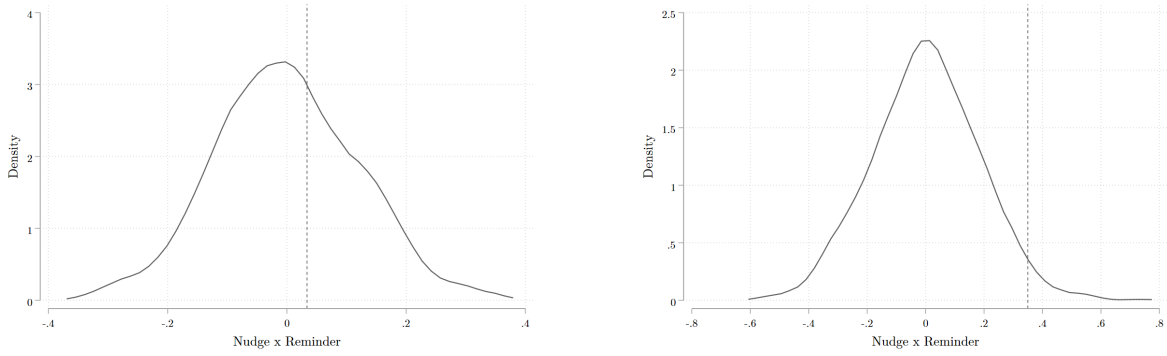


Note– Densities were obtained through randomization inference resampling under the null hypothesis that the estimate was insignificant. The vertical line indicates the location of the estimate under the implemented treatment assignment. The estimate in figure (a) corresponds to the one in the fifth column of Panel A in Table 6. The estimate in figure (b) corresponds to the one in the sixth column of Panel A in Table 6.

Figure 6: Nudge x Reminder Estimate Densities on Counseling (Second Round)

(a) Logit Model

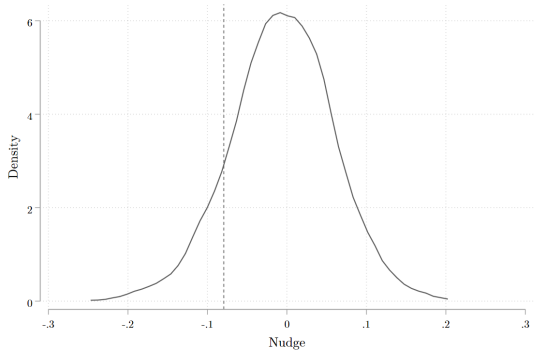
(b) Poisson Model



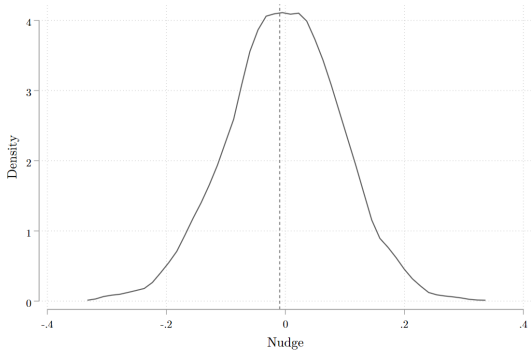
Note– Densities were obtained through randomization inference resampling under the null hypothesis that the estimate was insignificant. The vertical line indicates the location of the estimate under the implemented treatment assignment. The estimate in the figure (a) corresponds to the one in the fifth column of Panel B in Table 6. The estimate in figure (b) corresponds to the one in the sixth column of Panel B in Table 6.

Figure 7: Nudge Estimate Densities on Counseling by Race (First Round)

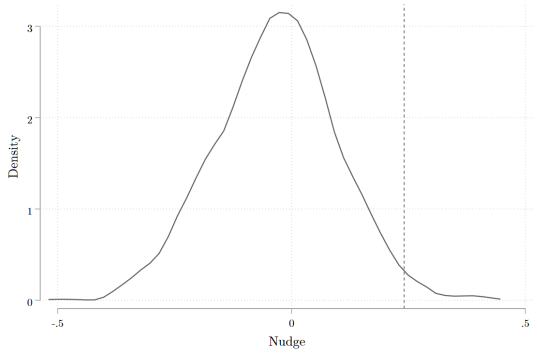
(a) White - Logit Model



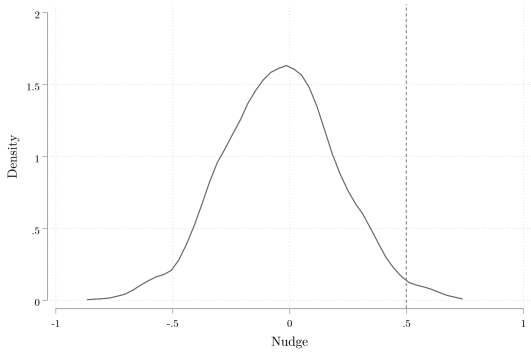
(b) White - Poisson Model



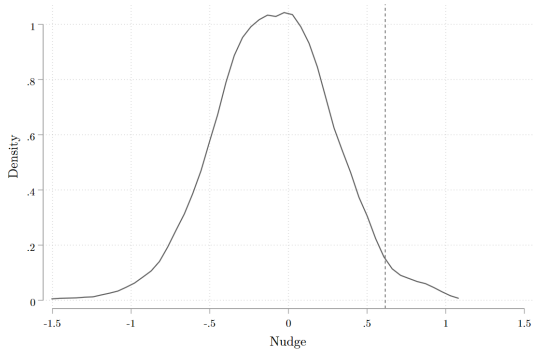
(c) Non-White Students - Logit Model



(d) Black Students - Logit Model



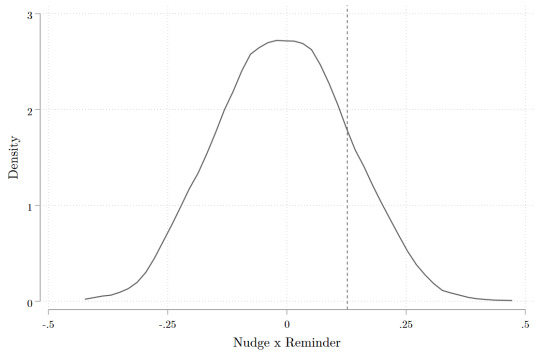
(e) Asian Students - Logit Model



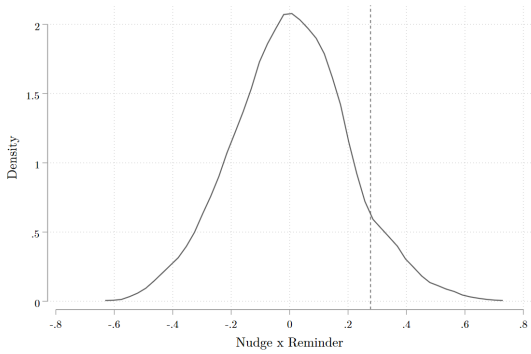
Note– Densities were obtained through randomization inference resampling under the null hypothesis that the estimate was insignificant. The vertical line indicates the location of the estimate under the implemented treatment assignment. The estimate in figure (a) corresponds to the one in the first column of Panel A in Table 7. The estimate in figure (b) corresponds to the one in the third column of Panel A in Table 7. The estimate in figure (c) corresponds to the one in the fifth column of Panel A in Table 7. The estimate in figure (d) corresponds to the one in the seventh column of Panel A in Table 7. The estimate in figure (e) corresponds to the one in the ninth column of Panel A in Table 7.

Figure 8: Nudge x Reminder Estimate Densities on Counseling by Race (Second Round)

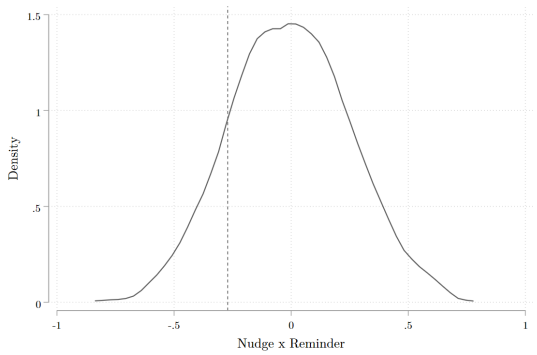
(a) White - Logit Model



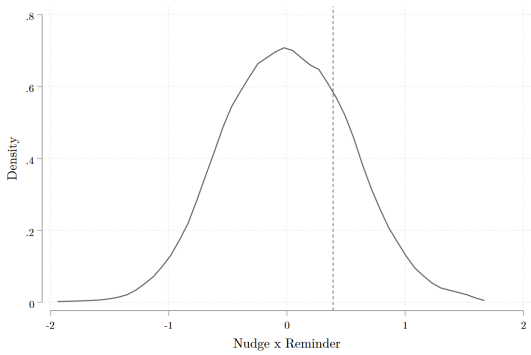
(b) White - Poisson Model



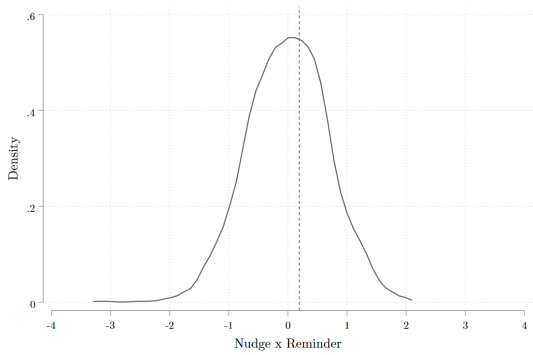
(c) Non-White Students - Logit Model



(d) Black Students - Logit Model



(e) Asian Students - Logit Model



Note– Densities were obtained through randomization inference resampling under the null hypothesis that the estimate was insignificant. The vertical line indicates the location of the estimate under the implemented treatment assignment. The estimate in figure (a) corresponds to the one in the first column of Panel A in Table 7. The estimate in figure (b) corresponds to the one in the third column of Panel B in Table 7. The estimate in figure (c) corresponds to the one in the fifth column of Panel B in Table 7. The estimate in figure (d) corresponds to the one in the seventh column of Panel B in Table 7. The estimate in figure (e) corresponds to the one in the ninth column of Panel B in Table 7.

Tables

Table 1: Setup

	No Reminder	Reminder
Info	Info	Info x 2
Nudge	Nudge	Nudge x 2

Table 2: Descriptives Across Treatment Groups

	Info		Info x 2		Nudge		Nudge x 2	
Variable	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Female	0.546	0.498	0.547	0.498	0.535	0.499	0.540	0.498
White	0.778	0.005	0.762	0.005	0.766	0.005	0.777	0.005
Black	0.081	0.003	0.088	0.003	0.088	0.003	0.084	0.003
Asian	0.047	0.003	0.050	0.003	0.049	0.003	0.048	0.003
Mixed Race	0.039	0.002	0.041	0.002	0.046	0.003	0.036	0.002
Other Race	0.003	0.001	0.004	0.001	0.002	0.001	0.003	0.001
Hispanic	0.052	0.003	0.055	0.003	0.049	0.003	0.052	0.003
Freshman	0.239	0.426	0.228	0.420	0.230	0.421	0.227	0.419
Sophomore	0.241	0.428	0.238	0.426	0.247	0.431	0.240	0.427
Junior	0.238	0.426	0.250	0.433	0.242	0.429	0.245	0.430
Senior	0.282	0.450	0.284	0.451	0.281	0.449	0.288	0.453
GPA	3.350	0.545	3.357	0.528	3.355	0.543	3.343	0.543
Honors	0.180	0.384	0.181	0.385	0.178	0.382	0.190	0.393
In-State	0.560	0.496	0.571	0.495	0.566	0.496	0.573	0.495
Counseling-1st Round	0.069	0.366	0.071	0.368	0.065	0.353	0.075	0.383
Counseling-2nd Round	0.062	0.331	0.065	0.328	0.061	0.309	0.072	0.354
Social Events-1st Round	0.088	0.283	0.088	0.284	0.085	0.279	0.084	0.278
Social Events-2nd Round	0.089	0.284	0.088	0.283	0.086	0.281	0.084	0.277
Fitness & Wellness-1st Round	0.355	0.479	0.363	0.481	0.362	0.481	0.369	0.483
Fitness & Wellness-2nd Round	0.322	0.467	0.332	0.471	0.327	0.469	0.330	0.470
Observations	6,643		6,642		6,643		6,642	

Note— Students in group "Info" received the basic information email once. Students in group "Info x 2" received the basic information email twice. Students in group "Nudge" received the nudging email once. Students in group "Nudge x 2" received the nudging email twice.

Table 3: Mean Differences Tests

	Ix2-I	N-I	Nx2-I	N-Ix2	Nx2-Ix2	Nx2-N
	(1)	(2)	(3)	(4)	(5)	(6)
Female	0.001	−0.011	−0.006	−0.012	−0.007	0.005
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
White	−0.016**	−0.012*	−0.002	0.004	0.014*	0.010
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Black	0.007	0.007	0.003	0.000	−0.004	−0.004
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Asian	0.003	0.001	0.001	−0.001	−0.002	0.000
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Mixed Race	0.002**	0.007	−0.003	0.005	−0.004	−0.010***
	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)
Other Race	0.001	0.000	0.000	−0.002	−0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Hispanic	0.003	−0.003	0.000	−0.006	−0.003	0.003
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Freshman	−0.010	−0.009	−0.012	0.001	−0.002	−0.003
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Sophomore	0.012	0.005	0.008	−0.007	−0.004	0.003
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Junior	−0.003	0.006	−0.001	0.009	0.002	−0.007
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Senior	0.001	−0.002	0.005	−0.003	0.004	0.007
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Honors	0.001	−0.002	0.010	−0.004	0.009	0.013*
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
GPA	0.007	0.005	−0.007	−0.002	−0.014	−0.012
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
In-state	0.011	0.006	0.013	−0.005	0.002	0.007
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
P-value joint significance	0.52	0.40	0.54	0.35	0.68	0.18

Note— The table provides the mean comparison tests between the indicated columns. Group I represents the "Info" group that received the basic email once. Group Ix2 represents the "Info x 2" group that received the basic email twice. Group N represents the "Nudge" group that received the nudging email once. Group Nx2 represents the "Nudge x 2" group that received the nudging email twice. "P-value joint significance" refers to the p-value from the joint significance test of all coefficients obtained from a probit model using all controls to predict assignment to the Ix2 group restricting sample to Ix2 and I treatment groups (column (1)), the N group restricting sample to N and I treatment groups (column (2)), the Nx2 group restricting sample to Nx2 and I treatment groups (column (3)), the N group restricting sample to N and Ix2 treatment groups (column (4)), the Nx2 group restricting sample to Nx2 and Ix2 treatment groups (column (5)) and the Nx2 group restricting sample to Nx2 and N treatment groups (column (6)). Robust standard errors are in parentheses. *, **, *** denotes significant at 10, 5, and 1 percent, respectively.

Table 4: Email Engagement Across Rounds

	Email Recipients	Number of Clicks
First Round - Basic Email	13,285	3,339
First Round - Nudging Email	13,285	4,799
Second Round - Basic Email	6,642	5,534
Second Round - Nudging Email	6,642	7,937

Table 5: The Effect of Block Variables on Counseling Visits

	First Round of Visits		Second Round of Visits	
	$P(Visits_i)$	$E(Visits_i \mid Visits_i \geq 1)$	$P(Visits_i)$	$E(Visits_i \mid Visits_i \geq 1)$
Female	0.0299***	−0.2768***	0.0302***	0.0151
	(0.0027)	(0.0974)	(0.0027)	(0.0784)
Black	−0.0141***	0.0271	−0.0185***	−0.2395**
	(0.0040)	(0.1647)	(0.0038)	(0.1106)
Asian	−0.0199***	0.0200	−0.0142***	−0.0807
	(0.0047)	(0.2553)	(0.0052)	(0.2038)
Hispanic	0.0071	−0.0500	0.0258	−0.3175
	(0.0137)	(0.2710)	(0.0160)	(0.2195)
Other Race	−0.0129	−0.5227	−0.0156	−0.2803
	(0.0164)	(0.3354)	(0.0157)	(0.3317)
Mixed Race	0.0001	0.1073	0.0017	0.1063
	(0.0060)	(0.1590)	(0.0061)	(0.1799)
Freshman	−0.0004	−0.0600	0.0065*	−0.2373***
	(0.0036)	(0.1020)	(0.0039)	(0.0787)
Sophomore	−0.0041	−0.1504*	0.0003	−0.1698**
	(0.0035)	(0.0905)	(0.0036)	(0.0779)
Junior	0.0047	−0.1369	0.0009	−0.1257
	(0.0037)	(0.0921)	(0.0037)	(0.0776)
Honors	0.0215***	−0.0130	0.0190***	0.1634**
	(0.0039)	(0.0869)	(0.0038)	(0.0744)
Observations	26,570	1,206	26,570	1,229
Mean dep. variable	0.05	1.55	0.05	1.40
College FE	Yes	Yes	Yes	Yes

Note—Results come from estimating equations (1), and (2), and the effects of block variables on counseling visits. The first two columns include the average marginal effect of the Logit and the Poisson model for the first round of visits and the last two columns include the average marginal effect of the Logit and the Poisson model for the second round of visits. All estimations include college fixed effects. Robust standard errors are in parentheses. *, **, *** denotes significant at 10, 5, and 1 percent, respectively.

Table 6: Effect of Nudge & Reminder on Counseling Visits

	$P(Visits_i)$		$E(Visits_i \mid Visits_i \geq 1)$		$P(Visits_i)$		$E(Visits_i \mid Visits_i \geq 1)$	
	Est.	AME	Est.	AME	Est.	AME	Est.	AME
Panel A: First Round Results								
Nudge	−0.0160	−0.0007	0.0497	0.0470	−0.0138	−0.0006	0.0464	0.0439
	(0.0592)	(0.0026)	(0.0783)	(0.0740)	(0.0592)	(0.0026)	(0.0783)	(0.0739)
Observations	26,570	26,570	1,206	1,206	26,570	26,570	1,206	1,206
Mean dep. variable	0.05	0.05	1.55	1.55	0.05	0.05	1.55	1.55
RI test p-value	0.79		0.53		0.80		0.54	
Panel B: Second Round Results								
Reminder (Info Groups)	0.0578	0.0025	−0.0798	−0.0598	0.0543	0.0023	−0.0726	−0.0541
	(0.0843)	(0.0036)	(0.1258)	(0.0945)	(0.0844)	(0.0036)	(0.1244)	(0.0928)
Reminder (Nudge Groups)	0.0835	0.0038	0.2587**	0.1773**	0.0880	0.0040	0.2769**	0.1903**
	(0.0817)	(0.0037)	(0.1302)	(0.0882)	(0.0818)	(0.0037)	(0.1304)	(0.0885)
Nudge × Reminder	0.0257	0.0014	0.3385*	0.2371*	0.0337	0.0017	0.3495*	0.2444*
	(0.1174)	(0.0052)	(0.1813)	(0.1294)	(0.1175)	(0.0052)	(0.1706)	(0.1285)
Observations	26,570	26,570	1,229	1,229	26,570	26,570	1,229	1,229
Mean dep variable	0.05	0.05	1.40	1.40	0.05	0.05	1.40	1.40
RI test p-value	0.84		0.06		0.78		0.05	
College FE	No	No	No	No	Yes	Yes	Yes	Yes

Note—Results come from estimating equations (1), and (2) with counseling visits as the dependent variable. The first column of every estimation includes the coefficient estimates (Est.) and the second the average marginal effects (AME). Each observation is weighted by the inverse of the proportion of subjects in its block that are assigned to a certain group (Info, Infox2, Nudge and Nudgex2). All estimations control for honors status. On panel A, the "RI test p-value" row includes the p-values of the "Nudge" estimate using randomization inference. On panel B, the "RI test p-value" row includes the p-values of the "Nudge x Reminder" estimate using randomization inference. Robust standard errors are in parentheses. *, **, *** denotes significant at 10, 5, and 1 percent, respectively.

Table 7: Effect of Nudge & Reminder on Counseling Visits by Race

	White				Non-White		Black		Asian	
	$P(Visits_i)$		$E(Visits_i \mid Visits_i \geq 1)$		$P(Visits_i)$		$P(Visits_i)$		$P(Visits_i)$	
	Est.	AME	Est.	AME	Est.	AME	Est.	AME	Est.	AME
Panel A: First Round Results										
NNudge	−0.0794	−0.0035	−0.0095	−0.0088	0.2408*	0.0094*	0.4987**	0.0159**	0.6489*	0.0166*
	(0.0663)	(0.0029)	(0.0895)	(0.0829)	(0.1327)	(0.0052)	(0.2411)	(0.0076)	(0.3656)	(0.0093)
Observations	20,481	20,481	961	961	6,089	6,089	2,270	2,270	1,289	1,289
Mean dep. variable	0.05	0.05	1.54	1.54	0.04	0.04	0.03	0.03	0.03	0.03
RI test p-value	0.24		0.90		0.08		0.04		0.06	
Panel B: Second Round Results										
Reminder (Info Groups)	0.0644	0.0029	−0.0081	−0.0058	0.0134	0.0005	−0.4597	−0.0113	−0.3230	−0.0092
	(0.0940)	(0.0042)	(0.1351)	(0.0971)	(0.1926)	(0.0069)	(0.3851)	(0.0095)	(0.4767)	(0.0135)
Reminder (Nudge Groups)	0.1910**	0.0086**	0.2687*	0.1997*	−0.2575	−0.0120	−0.0692	−0.0023	0.3443	0.0007
	(0.0932)	(0.0042)	(0.1370)	(0.1011)	(0.1734)	(0.0080)	(0.3348)	(0.0110)	(0.6474)	(0.0148)
Nudge × Reminder	0.1266	0.0058	0.2768	0.2056	−0.2710	−0.0125	0.3906	0.0091	0.0213	0.0099
	(0.1323)	(0.0059)	(0.1941)	(0.1405)	(0.2599)	(0.0106)	(0.5132)	(0.0146)	(0.4381)	(0.0200)
Observations	20,481	20,481	969	969	6,089	6,089	2,270	2,270	1,289	1,289
Mean dep variable	0.05	0.05	1.42	1.42	0.04	0.04	0.03	0.03	0.03	0.03
RI test p-value	0.35		0.14		0.30		0.46		0.74	
College FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note—Results come from estimating equations (1), and (2) with counseling visits as the dependent variable. The first column of every estimation includes the coefficient estimates (Est.) and the second the average marginal effects (AME). For White students the sample size allows the estimation of the Logit and Poisson model. For Non-White, Black and Asian sample size allows the estimation of the Logit model only. Each observation is weighted by the inverse of the proportion of subjects in its block that are assigned to a certain group (Control, Control x 2, Nudge and Nudge x 2). All estimations control for honors status. On panel A, the "RI test p-value" row includes the p-values of the "Nudge" estimate with randomization inference. On panel B, the "RI test p-value" row includes the p-values of the "Nudge x Reminder" estimate with randomization inference. Robust standard errors are in parentheses. *, **, *** denotes significant at 10, 5, and 1 percent, respectively.

Table 8: Effect of Nudge & Reminder on Involvement

	$P(Social\ Events_i)$		$P(Wellness\ \&\ Fitness_i)$	
	Est.	AME	Est.	AME
Panel A: First Round Results				
Nudge	−0.0291	−0.0022	0.0246	0.0055
	(0.0443)	(0.0034)	(0.0261)	(0.0058)
Observations	26,570	26,570	26,570	26,570
Mean dep. variable	0.09	0.09	0.36	0.36
RI test p-value	0.52		0.35	
Panel B: Second Round Results				
Reminder (Info Groups)	−0.0103	−0.0008	0.0457	0.0097
	(0.0618)	(0.0048)	(0.0377)	(0.0080)
Reminder (Nudge Groups)	−0.0452	−0.0035	0.0004	0.0001
	(0.0630)	(0.0048)	0.0377	(0.0080)
Nudge × Reminder	−0.0349	−0.0027	−0.0453	−0.0097
	(0.0883)	(0.0068)	(0.0533)	(0.0114)
Observations	26,570	26,570	26,570	26,570
Mean dep. variable	0.09	0.09	0.33	0.33
RI test p-value	0.67		0.41	
College FE	Yes	Yes	Yes	Yes

Note—Results come from estimating equations (5) and (6) with attending social events as the dependent variable in the first two columns, and visiting to the wellness and fitness center as the dependent variable in the third and fourth columns. The first column of every set of estimations includes the coefficient estimates (Est.) and the second the average marginal effects (AME). Each observation is weighted by the inverse of the proportion of subjects in its block that are assigned to a certain group (Info, Infox2, Nudge and Nudgex2). All estimations include honors status and college fixed effects. On panel A, the "RI test p-value" row includes the p-values of the "Nudge" estimated using randomization inference. On panel B, the "RI test p-value" row includes the p-values of the "Nudge x Reminder" estimated using randomization inference. Robust standard errors are in parentheses. *, **, *** denotes significant at 10, 5, and 1 percent, respectively.

Table 9: Effect of Nudge & Reminder on Attendance on Social Events

	White		Non-White		Black		Asian	
	Est.	AME	Est.	AME	Est.	AME	Est.	AME
Panel A: First Round Results								
Nudge	−0.0700	−0.0053	0.1115	0.0092	0.2474*	0.0205*	−0.1152	−0.0094
	(0.0497)	(0.0038)	(0.0976)	(0.0080)	(0.1452)	(0.0120)	(0.1956)	(0.0160)
Observations	20,481	20,481	6,089	6,089	2,270	2,270	1,289	1,289
Mean dep. variable	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10
RI test p-value	0.15		0.35		0.13		0.60	
Panel B: Second Round Results								
Reminder (Info Groups)	−0.0687	−0.0052	0.1619	0.0141	0.0272	0.0021	−0.0964	−0.0100
	(0.0719)	(0.0054)	(0.1225)	(0.0106)	(0.2118)	(0.0165)	(0.2409)	(0.0251)
Reminder (Nudge Groups)	−0.0122	−0.0009	−0.1390	−0.0124	−0.1279	−0.0118	0.0083	0.0007
	(0.0733)	(0.0053)	(0.1241)	(0.0111)	(0.1953)	(0.0180)	(0.2803)	(0.0241)
Nudge × Reminder	0.0565	0.0043	−0.3009*	−0.0265*	−0.1552	−0.0139	0.1047	0.0108
	(0.1027)	(0.0076)	(0.1741)	(0.0153)	(0.2879)	(0.0244)	(0.3696)	(0.0348)
Observations	20,481	20,481	6,089	6,089	2,270	2,270	1,289	1,289
Mean dep. variable	0.08	0.08	0.10	0.10	0.10	0.10	0.11	0.11
RI test p-value	0.59		0.09		0.63		0.79	
College FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note— Results come from estimating equations (5) and (6) with attending social events as the dependent variable. The first column of every estimation includes the coefficient estimates (Est.) and the second the average marginal effects (AME). Each observation is weighted by the inverse of the proportion of subjects in its block that are assigned to a certain group (Info, Infox2, Nudge and Nudgex2). All estimations include honors status and college fixed effects. On panel A, the "RI test p-value" row includes the p-values of the "Nudge" estimated using randomization inference. On panel B, the "RI test p-value" row includes the p-values of the "Nudge x Reminder" estimated using randomization inference. Robust standard errors are in parentheses. *, **, *** denotes significant at 10, 5, and 1 percent, respectively.

Table 10: Effect of Nudge & Reminder on Fitness & Wellness Center Visits

	White		Non-White		Black		Asian	
	Est.	AME	Est.	AME	Est.	AME	Est.	AME
Panel A: First Round Results								
Nudge	0.0372	0.0084	−0.0308	−0.0065	0.1096	0.0212	−0.1113	−0.0257
	(0.0288)	(0.0065)	(0.0613)	(0.0130)	(0.0952)	(0.0184)	(0.1166)	(0.0269)
Observations	20,481	20,481	6,089	6,089	2,270	2,270	1,289	1,289
Mean dep. variable	0.37	0.37	0.32	0.32	0.28	0.28	0.38	0.38
RI test p-value	0.19		0.61		0.26		0.34	
Panel B: Second Round Results								
Reminder (Info Groups)	0.0474	0.0102	0.0390	0.0081	0.0047	0.0008	−0.0730	−0.0175
	(0.0426)	(0.0092)	(0.0806)	(0.0167)	(0.1465)	(0.0249)	(0.1622)	(0.0388)
Reminder (Nudge Groups)	0.0109	0.0023	−0.0374	−0.0077	−0.0720	−0.0130	−0.0417	−0.0098
	(0.0426)	(0.0092)	0.0805	(0.0166)	(0.1395)	(0.0252)	(0.1638)	(0.0386)
Nudge × Reminder	−0.0366	−0.0079	−0.0764	−0.0158	−0.0767	−0.0138	0.0313	0.0076
	(0.0603)	(0.0130)	(0.1139)	(0.0236)	(0.2027)	(0.0356)	(0.2305)	(0.0548)
Observations	20,481	20,481	6,089	6,089	2,270	2,270	1,289	1,289
Mean dep. variable	0.33	0.33	0.30	0.30	0.23	0.23	0.39	0.39
RI test p-value	0.52		0.50		0.72		0.85	
College FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note— Results come from estimating equations (5) and (6) with visiting the wellness and fitness center as the dependent variable. The first column of every estimation includes the coefficient estimates (Est.) and the second the average marginal effects (AME). Each observation is weighted by the inverse of the proportion of subjects in its block that are assigned to a certain group (Info, Infox2, Nudge and Nudgex2). All estimations include honors status and college fixed effects. On panel A, the "RI test p-value" row includes the p-values of the "Nudge" estimated using randomization inference. On panel B, the "RI test p-value" row includes the p-values of the "Nudge x Reminder" estimated using randomization inference. Robust standard errors are in parentheses. *, **, *** denotes significant at 10, 5, and 1 percent, respectively.

Table 11: The Effect of Block Variables on All Visits

	First Round of Visits		Second Round of Visits	
	$P(Visits_i)$	$E(Visits_i \mid Visits_i \geq 1)$	$P(Visits_i)$	$E(Visits_i \mid Visits_i \geq 1)$
Female	0.0358***	−0.1222	0.0365***	0.1325
	(0.0029)	(0.1101)	(0.0030)	(0.0983)
Black	−0.0185***	−0.0724	−0.0240***	−0.1783
	(0.0042)	(0.1949)	(0.0042)	(0.1640)
Asian	−0.0239***	0.2815	−0.0166***	−0.3023
	(0.0050)	(0.3430)	(0.0058)	(0.1984)
Hispanic	0.0023	0.5126	0.0254	0.6920
	(0.0140)	(0.4968)	(0.0169)	(0.5576)
Other Race	0.0007	−0.5270	−0.0031	0.6021
	(0.0265)	(0.6471)	(0.0264)	(1.2965)
Mixed Race	0.0072	0.1747	0.0094	−0.0530
	(0.0051)	(0.1483)	(0.0073)	(0.1304)
Freshman	−0.0063*	−0.0421	−0.0044	−0.1890*
	(0.0037)	(0.1316)	(0.0039)	(0.1100)
Sophomore	−0.0087**	−0.2106*	−0.0057	−0.1541
	(0.0036)	(0.1184)	(0.0038)	(0.1089)
Junior	0.0009	−0.0268	−0.0019	0.0437
	(0.0038)	(0.1217)	(0.0038)	(0.1147)
Honors	0.0244***	0.0428	0.0244***	0.3456***
	(0.0042)	(0.1131)	(0.0043)	(0.1055)
Observations	26,570	1,415	26,570	1,513
Mean dependent variable	0.05	1.84	0.06	1.68
College FE	Yes	Yes	Yes	Yes

Note—Results come from estimating equations (1), and (2) and the effect of block variables on all visits including, counseling, psychiatry, group therapy and coaching. The first two columns include the average marginal effect of the Logit and the Poisson model for the first round of visits and the last two columns include the average marginal effect of the Logit and the Poisson model for the second round of visits. All estimations include college fixed effects. Robust standard errors are in parentheses. *, **, *** denotes significant at 10, 5, and 1 percent, respectively.

Table 12: Effect of Nudge & Reminder on All Visits

	$P(Visits_i)$		$E(Visits_i \mid Visits_i \geq 1)$		$P(Visits_i)$		$E(Visits_i \mid Visits_i \geq 1)$	
	Est.	AME	Est.	AME	Est.	AME	Est.	AME
Panel A: First Round Results								
Nudge	−0.0013	−0.0001	0.0025	0.0035	−0.0012	−0.0001	0.0002	0.0003
	(0.0548)	(0.0028)	(0.0673)	(0.0924)	(0.0549)	(0.0028)	(0.0675)	(0.0926)
Observations	26,570	26,570	1,415	1,415	26,570	26,570	1,415	1,415
Mean dependent variable	0.05	0.05	1.84	1.84	0.05	0.05	1.84	1.84
RI test p-value	0.98		0.97		0.98		0.99	
Panel B: Second Round Results								
Reminder (Info Groups)	0.0284	0.0015	−0.2018	−0.2374	0.0237	0.0012	−0.2025	−0.2372
	(0.0763)	(0.0040)	(0.1036)	(0.1221)	(0.0764)	(0.0039)	(0.1036)	(0.1216)
Reminder (Nudge Groups)	0.0893	0.0049	0.1617	0.1770	0.0941	0.0052	0.1692	0.1853
	(0.0742)	(0.0041)	(0.1097)	(0.1192)	(0.0743)	(0.0041)	(0.1102)	(0.1197)
Nudge × Reminder	0.0609	0.0035	0.3635**	0.4144**	0.0704	0.0040	0.3717**	0.4225**
	(0.1064)	(0.0057)	(0.1506)	(0.1703)	(0.1066)	(0.0057)	(0.1506)	(0.1699)
Observations	26,570	26,570	1,513	1,513	26,570	26,570	1,513	1,513
Mean dependent variable	0.06	0.06	1.68	1.68	0.06	0.06	1.68	1.68
RI test p-value	0.52		0.02		0.50		0.02	
College FE	No	No	No	No	Yes	Yes	Yes	Yes

Note—Results come from estimating equations (1), and (2) with all visits including, counseling, psychiatry, group therapy and coaching, as the dependent variable. The first column of every model includes the coefficient estimates (Est.) and the second the average marginal effects (AME). Each observation is weighted by the inverse of the proportion of subjects in its block that are assigned to a certain group (Info, Infox2, Nudge and Nudgex2). All estimations control for honors status. On panel A, the "RI test p-value" row includes the p-values of the "Nudge" estimated using randomization inference. On panel B, the "RI test p-value" row includes the p-values of the "Nudge x Reminder" estimated using randomization inference. Robust standard errors are in parentheses. *, **, *** denotes significant at 10, 5, and 1 percent, respectively.

Table 13: Effect of Nudge & Reminder on All Visits by Race

	White				Non-White		Black		Asian	
	$P(Visits_i)$		$E(Visits_i \mid Visits_i \geq 1)$		$P(Visits_i)$		$P(Visits_i)$		$P(Visits_i)$	
	Est.	AME	Est.	AME	Est.	AME	Est.	AME	Est.	AME
Panel A: First Round Results										
Nudge	−0.0468	−0.0024	−0.0566	−0.0762	0.1908	0.0085	0.5879**	0.0208***	0.6347*	0.0184*
	(0.0614)	(0.0032)	(0.0767)	(0.1033)	(0.1232)	(0.0055)	(0.2295)	(0.0080)	(0.3409)	(0.0098)
Observations	20,481	20,481	1,130	1,130	6,089	6,089	2,270	2,270	1,289	1,289
Mean dependent variable	0.06	0.06	1.82	1.82	0.05	0.05	0.04	0.04	0.04	0.04
RI test p-value	0.44		0.49		0.13		0.01		0.06	
Panel B: Second Round Results										
Reminder (Info Groups)	0.0398	0.0021	−0.1940*	−0.2254*	−0.0424	−0.0019	−0.2813	−0.0083	−0.2423	−0.0089
	(0.0852)	(0.0046)	(0.1209)	(0.1358)	(0.1725)	(0.0076)	(0.3475)	(0.0103)	(0.4149)	(0.0152)
Reminder (Nudge Groups)	0.1785**	0.0099**	0.2334**	0.2599**	−0.2088	−0.0113	0.2219	0.0087	−0.0721	−0.0029
	(0.0840)	(0.0047)	(0.1180)	(0.1307)	(0.1607)	(0.0086)	0.3062	(0.0120)	(0.3971)	(0.0161)
Nudge × Reminder	0.1388	0.0078	0.4273***	0.4853***	−0.1664	−0.0094	0.5032	0.0170	0.1702	0.0060
	(0.1197)	(0.0065)	(0.1654)	(0.1884)	(0.2365)	(0.0115)	(0.4659)	(0.0159)	(0.5744)	(0.0222)
Observations	20,481	20,481	1,199	1,199	6,089	6,089	2,270	2,270	1,289	1,289
Mean dep variable	0.05	0.05	1.69	1.69	0.04	0.04	0.03	0.03	0.04	0.04
RI test p-value	0.23		0.01		0.47		0.27		0.90	
College FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note—Results come from estimating equations (1), and (2) with all visits including, counseling, psychiatry, group therapy and coaching, as the dependent variable. The first column of every model includes the coefficient estimates (Est.) and the second the average marginal effects (AME). For White students the sample size allows for the estimation of the Logit and the Poisson model. For non-White, Black and Asian students, sample size allows for the estimation of the Logit model only. Each observation is weighted by the inverse of the proportion of subjects in its block that are assigned to a certain group (Control, Control x 2, Nudge and Nudge x 2). All estimations control for honors status. On panel A, the "RI test p-value" row includes the p-values of the "Nudge" estimated using randomization inference. On panel B, the "RI test p-value" row includes the p-values of the "Nudge x Reminder" estimated using randomization inference. Robust standard errors are in parentheses. *, **, *** denotes significant at 10, 5, and 1 percent, respectively.

Table 14: Effect of Nudge & Reminder on Counseling - Linear Estimations

	Full Sample		White		Non-White	Black	Asian
	$P(Visits_i)$	$E(Visits_i \mid Visits_i \geq 1)$	$P(Visits_i)$	$E(Visits_i \mid Visits_i \geq 1)$	$P(Visits_i)$	$P(Visits_i)$	$P(Visits_i)$
Panel A: First Round Results							
Nudge	−0.0006	0.0287	−0.0035	−0.0059	0.0094*	0.0159**	0.0158*
	(0.0026)	(0.0485)	(0.0029)	(0.0542)	(0.0052)	(0.0076)	(0.0092)
Observations	26,570	1,206	20,481	961	6,089	2,270	1,289
Mean dep variable	0.05	1.55	0.05	1.54	0.04	0.03	0.03
Panel B: Second Round Results							
Reminder (Info Groups)	0.0023	−0.0343	0.0028	−0.0054	0.0005	−0.0114	−0.0081
	(0.0036)	(0.0585)	(0.0042)	(0.0609)	(0.0069)	(0.0096)	(0.0135)
Reminder (Nudge Groups)	0.0040	0.1164**	0.0086*	0.1248	−0.0119	−0.0020	−0.0028
	(0.0037)	(0.0549)	(0.0042)	(0.0639)	(0.0080)	(0.0109)	(0.0145)
Nudge × Reminder	0.0017	0.1507*	0.0057	0.1302	−0.0123	0.0094	0.0053
	(0.0052)	(0.0804)	(0.0059)	(0.0884)	(0.0106)	(0.0146)	(0.0200)
Observations	26,570	1,229	20,481	969	6,089	2,270	1,289
Mean dep variable	0.05	1.40	0.05	1.42	0.04	0.03	0.03
College FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note—Results come from estimating equations (1), and (2) for the full sample and White students, and from estimating equation (1) for non-White, Black and Asian students using ordinary least square estimations with counseling visits as the dependent variable. Each observation is weighted by the inverse of the proportion of subjects in its block that are assigned to a certain group (Control, Control x 2, Nudge and Nudge x 2). All estimations control for honors status. Robust standard errors are in parentheses. *, **, *** denotes significant at 10, 5, and 1 percent, respectively.