THE EFFECTS OF APPOINTMENT DELAY AND REMINDERS ON APPOINTMENT-KEEPING BEHAVIOR

by

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Abstract

THE EFFECTS OF APPOINTMENT DELAY AND REMINDERS

ON APPOINTMENT-KEEPING BEHAVIOR

by

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For meetings and programs that require participants to make appointments, it is important to maximize the number of appointments kept. The present study investigated the effects of appointment delay and phone reminders on college students' appointment-keeping behavior. Experiments 1 and 2 took place in different semesters, in which 38 and 68 students, respectively, made appointments. A significantly higher percentage of students kept their appointments in the 1-day appointment delay condition than in the 15-day delay condition with no reminders in both experiments ($p = .034$ in Experiment 1; $p < .001$ in Experiment 2). Phone reminders provided 1 day prior to the appointment dates increased the percentage of appointments kept in the 15-day delay condition in Experiment 2 ($p = .002$). In Experiment 3, a total of 97 students made appointments. The percentage of appointments kept was higher in the 1-day delay condition than in the 8-, 15-, and 29-day delay conditions with no reminders ($p = .008$). There was no significant difference among the latter three conditions ($p = .919$). Phone reminders effectively increased appointment-keeping in the 8-, 15-, and 29-day delay conditions ($p = .014$). In addition, no statistical significance was detected between the 1-day with no

reminders condition and the 8-, 15-, and 29-day delay conditions with reminders (p = .336). A conceptual model to depict the effects of appointment delay and reminders is presented, which indicates that the value of appointment, or the probability of appointment-keeping behavior, decreases as the amount of appointment delay increases. To investigate the shape of the function of appointment delay further, another parametric study with appointment delay of 1-8 days is recommended. The effect of the time interval between reminders and appointment dates may also be studied in the future.

Dedication

This work is dedicated to my parents, Takashi and Tomino Watanabe, who have taught me innumerable life lessons.

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THE EFFECTS OF APPOINTMENT DELAY AND REMINDERS ON APPOINTMENT-KEEPING BEHAVIOR

by

MARI WATANABE-ROSE

Appointment-making is frequently occurring behavior in everyday life. Individuals make appointments before they see a doctor, have a job interview or business meeting, participate in a research study, etc. For meetings and programs that require individuals to make appointments, maximizing the number of appointments kept by those individuals is important for at least a few reasons (Greenspoon, 1997). First, a broken appointment creates idle time, during which the individual who originally made the appointment and/or others could have benefited in some way. Second, financial damage caused by broken appointments is not negligible. Not only did the appointments generate labor costs, but they also might have brought revenues. Third, when the appointment made was for a research program in which the effect of a treatment method would be assessed, the findings may not be externally valid because of some unknown variables that differentiate between those who kept their appointments and those who did not.

Appointment Delay and Appointment-Keeping Behavior

Appointment-keeping behavior has been extensively researched in the area of patient compliance in health care utilization over 30 years. Some research focused on subject variables that influence appointment-keeping, such as patients' demographic characteristics, the severity of their problems, and their expectations for the treatment

(e.g., Gottesfeld & Martinez, 1972; Slaikeu, Lester, & Tulkin, 1973). While some studies found relationships between appointment-keeping and variables including patients' age, gender, and socio-economic status, others reported no significant relationships between them (Stern & Brown, 1994). Although the outcomes of these studies may be useful to predict who may and may not keep their appointments, they unfortunately have no practical significance for problem-solving, namely, increasing appointment-keeping behavior.

Other research has demonstrated that patients' appointment-keeping behavior can in fact be influenced by certain environmental or contextual variables. One such variable is appointment delay, which is defined as the time interval between appointment-making and the actual appointment date (Greenspoon, 1997; Tucker & Davison, 2000). For example, Ross, Friman, and Christophersen (1993) investigated the effect of appointment delay on appointments kept at a pediatric clinic. When the appointment delay was less than 4 wks, 63% of the patients kept their appointment, while 47% kept appointments when appointment delay was more than 4 wks ($p < .02$). Benjamin-Bauman, Reiss, and Bailey (1984) conducted a similar study with appointments made for gynecologic exams. The two studies with 1-wk and 3-wk delays, and 1-day and 2-wk delays, respectively, showed that shorter appointment delays produced significantly higher percentages of appointments kept. Specifically, the percentages of appointments kept were 75% vs. 57% in the first study ($p < .01$) and 72% vs. 52% in the second ($p < .05$). These percentages of appointment-keeping for immediate and delayed appointments were consistent with Robin's (1976) study. When

psychiatric out-patients were offered appointments within 7 days, 76% of them kept the appointments; on the other hand, 53% kept appointments that were 6-18 wks delayed, or12 wks of delay on average ($p < .001$). Further, Grieves (1973) found that 81% of clients with 2-day appointment delays kept their appointments for pre-therapy sessions at a mental health center, while 71% with 10-day appointment delays kept their appointments ($p < .10$).

Folkins, Hersch, and Dahlen (1980), unlike the above studies, had three conditions of appointment delay. They randomly assigned potential clients for mental health services into one of the following groups: 3 days or less, 6 - 8 days, and 16 - 19 days. The results showed that appointment-keeping decreased as the waiting period increased (76%, 62%, and 46% for the three conditions, respectively, $p < .01$). Although the definitions of “immediate” and “delayed” appointments differed in each study, the overall trend was identical: as the appointment delay increased, the percentage of appointments kept decreased.

When similar studies were conducted for substance abuse treatment programs, as opposed to general health and mental health programs, overall appointment-keeping seemed to be somewhat suppressed. The outcome of such studies, however, consistently demonstrated the inverse effect of appointment delay on appointment-keeping behavior. For example, Festinger, Lamb, Kirby, and Marlowe (1996) reported that when potential patients called and were told to come immediately to the cocaine treatment clinic, more appointments were kept (59%) than when patients were told to wait 1 - 7 days, or 4.4 days on average (39%). These outcomes were

significantly different ($p < .05$). In Stark, Campbell, and Brinkerhoff (1990), potential patients for a drug treatment program called and were told to come immediately to the clinic or in 1 - 14 days (a mean of 9.7-day delay). The percentages of appointment-keeping were 61% for the immediate group and 38% for the delayed group ($p < .025$).

The inverse relationship between appointment delay and appointment-keeping was confirmed further by Tucker and Davison (2000). They reviewed 8 experimental and 19 descriptive studies and found the correlation of $r = -.464$ between appointment delay and appointments kept for health-related services. Tucker and Davison concluded that potential patients for general health services, substance abuse treatment program, and mental health programs are more likely to keep their initial appointments when they are seen more immediately after making the appointments.

Appointment Reminders and Appointment-Keeping Behavior

While some researchers have looked for variables that influence appointment-keeping, others have attempted to find more practical and realistic procedures to increase appointment-keeping. For example, Turner and Vernon (1976) demonstrated that telephone appointment reminders significantly increased attendance in a mental-health center. The percentages of no-shows in an ABAB reversal design were 32% and 25% in baseline (no reminders) and 11% and 14% with phone reminders provided 1 - 3 days before the appointments.

Friman, Finney, Rapoff, and Christophersen (1985) examined the combined effect of having a parking pass, mailed reminders (provided at least 5 weekdays before

the appointment), and telephone reminders (provided at least 24 hrs before the appointment) on the appointments kept and broken. A multiple-baseline design across pediatric care providers showed overall mean percentages for five providers for kept appointments were 56% in baseline and 75.3% in intervention. Overall means for broken appointments were 30.5% in baseline and 9.8% in intervention. In baseline and intervention, 13.5% and 14.9% of participants, respectively, cancelled their appointments. A follow-up study conducted by Ross et al. (1993) investigated the effects of various combinations of the three components: parking pass, mail reminder, and phone reminder. It was found that the effect of phone reminders alone on appointment-keeping did not significantly differ from those of the mail/telephone/pass or mail/pass combinations.

Present Study

As introduced above, the effect of appointment delay on appointment-keeping has been observed in several studies. Further, Tucker and Davison's (2000) review indicated a negative correlation between appointment delay and appointment-keeping. The relationship between the two variables, however, was researched solely in health-related settings. Therefore, it was not clear whether the effect of appointment delay on appointment-keeping would be universal. Additionally, since the previous studies were conducted in applied settings, one may point out some procedural limitations in these studies. For example, many of them did not clearly describe what was told to the potential participant when the participant turned down the appointment date that was initially suggested. The necessity for suggesting a second or possibly

third appointment date derived from initial scheduling difficulties may be a reason why many of the studies had a range of days as a single level to the independent variable (e.g., 3 days or less, 6-8 days, and 16-19 days in Folkins et al., 1980). In short, at least some of the initial offers may have been rejected, which probably prevented the researchers from conducting more precise parametric studies.

In the present study, the experimenter investigated the effects of appointment delay and telephone reminders on the percentage of appointments kept in a laboratory setting. Three experiments were conducted with college students and the time interval between appointment-making and the appointment (i.e., appointment delay) was manipulated into two (Experiments 1 and 2) and four conditions (Experiment 3). One of the goals of the present study was to conduct a parametric study to investigate the shape of the function of appointment delay. Moreover, the present study would be the first to test the effects of appointment delay and reminders together to examine the presence of an interaction between these two variables.

When making an appointment by phone, the student was only told that the appointment would be for a research project regarding volunteer work (cover story). The student was also told that, as a result of participating in the research, s/he would be given partial credit required for the course s/he was taking. The students' appointment-keeping behavior was measured. In Experiments 1 and 2, the two conditions for appointment delay were 1 day and 15 days. The students in the 15-day delay conditions were divided into reminder and no reminder conditions. In Experiment 3, although the parameters were identical to those in the earlier

experiments, students were assigned to one of four appointment-delay conditions: 1, 8, 15, and 29 days. The students in the latter three conditions were further divided into reminder and no reminder conditions.

Based on the results of the previous studies, the outcome of the present study was predicted as follows: (a) the percentage of appointments kept would be an inverse function of appointment delay; and (b) the participants in the reminder condition would show a higher percentage of appointment-keeping behavior than those in the no reminder condition.

Experiments 1 and 2

Method

Setting, Participants, and Recruitment Procedures

Experiments 1 was conducted in the Spring 2006 semester and Experiment 2 in the Fall 2006 semester with students from the Introductory Psychology course (Psychology 101) at Queens College as participants. Psychology 101 students were required to fulfill a course requirement by either participating in research studies as subjects or writing reports. Students who participated in the present experiments were given partial credit for the requirement.

In Spring 2006 (January 26th – May 17th), the experimenter requested Psychology 101 instructors on April 23rd to provide their students with the following information in class: 1) participants are wanted for a "research project on volunteer work"; 2) each participant will be given a 1-hour credit toward the Psychology 101 research requirement; 3) the duration of the experimental session for each participant will be approximately 30 min; 4) the participants must be 18 years old or older; and 5) students who are interested in participating are expected to call the experimenter to make appointments. Forty-three students called the experimenter during the period of May 1st through 10th. The number of students who made appointments for experimental sessions is provided in Table 1 below.

Since only a small number of students contacted the experimenter in Spring 2006, the procedure for recruiting participants was modified as follows in Fall 2006 (August 30th – December 13th) to increase the number of participants. The

experimenter requested Psychology 101 instructors to distribute sign-up sheets (Appendix A), which contained the information in 1) - 4) above, to their students in class. Students who were interested in participating in the experiment wrote their names and phone numbers on the sign-up sheet, which also stated that the experimenter would call the students who signed up. The sheets were distributed in class during the period of October 16th through 31st. A total of 121 students wrote their names and phone numbers on the sign-up sheets, each of whom the experimenter called between October 25th and November 13th. The number of students who made appointments for experimental sessions is provided in Table 1 below.

Variables

Definitions of terms. The following definitions were used in Experiments 1 - 3. *Appointment-making* occurred when the experimenter and the student talked directly on the phone and decided the date and time for the student's visit to the laboratory. *Appointment delay* was defined as the number of days between appointment-making and the appointment date. For example, when the appointment was made for the next day, there was an appointment delay of 1 day. A *phone reminder*, which consisted of the date, time, and location for the appointment, occurred when this information was provided to the students via telephone 1 day prior to the appointment date. A *kept appointment* occurred when the students came to the designated laboratory within 20 min after the agreed-upon appointment time. A *cancellation* occurred when the student called the experimenter before the agreed-upon appointment time to cancel or reschedule the appointment. A *broken appointment* was recorded when the student did

not come to the laboratory within 20 min after the agreed-upon appointment time without canceling or rescheduling.

Independent variables. There were two independent variables in the present study: appointment delay and phone reminders. First, appointment delay consisted of two levels, 1 day and 15 days. The experimenter randomly assigned the students into each condition, by drawing one of the two cards saying “1-DAY” and “15-DAY” (Experiment 1) or three cards saying “1-DAY,” “15-DAY,” and “15-DAY” (Experiment 2) from a bag. Then, the experimenter randomly assigned the students in the 15-day delay condition into the reminder and no reminder conditions by again drawing one of the “REMINDER” and “NO REMINDER” cards. Each participant in the reminder condition was given a phone reminder 1 day prior to the appointment date. The students in the no reminder condition did not receive any phone calls.

Dependent variable. The dependent variable was the percentage of appointments kept. Specifically, the number of students who showed up within 20 min after their appointment times was divided by the number of appointments made but not cancelled; the quotient was multiplied by 100. The numbers of cancellations were also recorded.

Procedure

Initial calls. As described above, the initial phone call to make an appointment was made either by the students (Experiment 1) or by the experimenter (Experiment 2). In both experiments, all the appointments were made for Tuesday, Wednesday, Thursday, or Friday because of the experimenter’s availability. Therefore, in

Experiment 1, when the student called Monday through Thursday, the experimenter returned their calls on the same day to make appointments. When the students called Friday through Sunday, the calls were returned on the next Monday. In Experiment 2, the experimenter called the students Monday through Thursday to make appointments. When the student did not answer the phone, the experimenter left a message in her/his voice mailbox or with a family member or roommate. If the student did not return the initial call, the experimenter did not make any further attempt to contact the student.

Appointment-making. In the phone conversation to make an appointment, the experimenter told the student the following: 1) the experimental session will take approximately 30 min; 2) there will be open time slots for an appointment either tomorrow (1-day delay) or in 15 days, depending on the condition into which the student was assigned; 3) the student can make an appointment anytime during a given 3- to 4-hr period (e.g., between 11 a.m. and 3 p.m.); and 4) as a result of participation, the student will be awarded a 1-hr credit toward the Psychology 101 research requirement.

If the student said s/he would not be available on the appointment date suggested by the experimenter, an appointment was made for another day but the student's data were not included in the study. To minimize the number of such rejections of first appointment date suggested, the 3- to 4-hr time period mentioned above always included the college's "free hours" (12:00 – 12:50 pm) during which classes were not scheduled to meet. After the student agreed to participate in the study on the suggested date and chose an appointment time, the experimenter repeated the

date and time for the appointment, the building and room number to which the student would come, and the experimenter's name and phone number.

Phone reminder. The students in the 15-day delay condition in each experiment were randomly assigned into the reminder or no reminder condition. Each student in the reminder condition received a phone call from the experimenter, 1 day (17 – 27 hrs) prior to the appointment date. The experimenter told the students that she called to make sure they "still have an appointment tomorrow." The experimenter then stated the date, time, and location of the appointment, said, "I'll see you tomorrow," and hung up the phone. When the student did not answer the phone, the experimenter left the above message in the student's voice mailbox, or with a family member or roommate. The experimenter did not call the students in the no reminder condition between appointment-making and the appointment date.

Experimental session. When the student showed up for her/his appointment, s/he was debriefed concerning the actual purpose of the research. Specifically, the experimenter told the student the following: (a) the purpose of the research is to investigate the effect of appointment delay and reminders on appointment-keeping behavior; (b) this is a pilot study for a larger project for recruiting more individuals to community-based programs; (c) the student is required to carefully read the consent form (Appendix B) and sign it if s/he decides to participate in the study; and (d) if the student decides not to participate in the study, all the records regarding her/him will be destroyed. None of the students at this point withdrew from the study in either experiment. After completing the above process, the experimenter gave the student a

paper document that specified that the student received a 1-hr credit toward the Psychology 101 research requirement. The experimental session lasted approximately 15-20 min for each student.

Results

Final Number of Participants

Table 1 shows the number of students who called or signed up to participate, made appointments, and were assigned into each condition in Experiments 1 and 2. In Experiment 1, 43 students called the experimenter, of which 38 made appointments; 5 students told the experimenter that they would not be available on the suggested appointment dates. Seventeen students of the 38 students were randomly assigned into the 1-day delay condition, and 21 students into the 15-day condition. Four of the latter, however, cancelled their appointments by phone prior to the appointment times, resulting in 17 students participating in the 15-day condition. The students in the 15-day delay condition were further divided into the reminder (8 students) or no reminder condition (9 students).

In Experiment 2, 121 students wrote their names and phone numbers on the sign-up sheets, all of whom the experimenter called. A total of 68 students made appointments. Six students were not available on the suggested dates, 10 students decided to participate in another study, and 37 students did not return the experimenter's initial phone call. Twenty nine students were randomly assigned into the 1-day delay condition, and 39 into the 15-day delay condition. Three of the latter, however, cancelled their appointments by phone prior to the appointment times, resulting in 36 students participating in the 15-day condition. Sixteen students in the 15-day delay condition were further assigned to the reminder condition; 20 to the no reminder condition.

Table 1. The final number of participants in Experiments 1 and 2. In the right-hand column, R stands for Reminders and NR for No Reminders.

Exp	Called/ Signed Up	Made Appts	Delays	Reminders
1	43	38 5 not available	1 day - 17	NR - 17
			15 days - 17 4 cancelled	R - 8 NR - 9
2	121	68 6 not available 10 another study 37 not returned calls	1 day - 29	NR - 29
			15 days - 36 3 cancelled	R - 16 NR - 20

Appointment Delay and Reminders

Figure 1 shows the percentages of appointments kept plotted as a function of appointment delay and reminders in Experiments 1 and 2. In Experiment 1, when the students were offered appointments for the next day, 16 out of 17 (94%) of the appointments were kept. When the students were told to come in 15 days, the percentage of appointments kept was 5 out of 9 (56%) without reminders. When the students in the 15-day delay condition were provided with phone reminders, 6 out of 8 appointments (75%) were kept. One-tailed Fisher's exact tests showed that significantly more students kept their appointments in 1-day delay than in 15-day delay with no reminders ($p = .034$). Although there was a trend between 15-day delay with reminders and with no reminders, the difference was not significant ($p = .373$).

In Experiment 2, when the students were offered appointments for the next day, 26 out of 29 appointments (90%) were kept. When the students were told to come in 15 days, the percentage of appointments kept was 7 out of 20 appointments (35%). When the students were offered appointments in 15 days and provided with phone reminders, 14 out of 16 (88%) appointments were kept. One-tailed Fisher's exact tests showed that there was a significant difference between the appointment-keeping in 1-day delay and 15-day delay with no reminders ($p < .001$). There was also a significant difference found between 15-day delay with reminders and with no reminders ($p = .002$).

Figure 1. The percentages of appointments kept in the 1-day and 15-day delay conditions as a function of appointment delay and reminders. The top and bottom panels show the results for the Spring (Experiment 1) and Fall (Experiment 2) semesters in 2006, respectively. The timing of the experiment in the semester and appointment-making procedures differed in the two experiments.

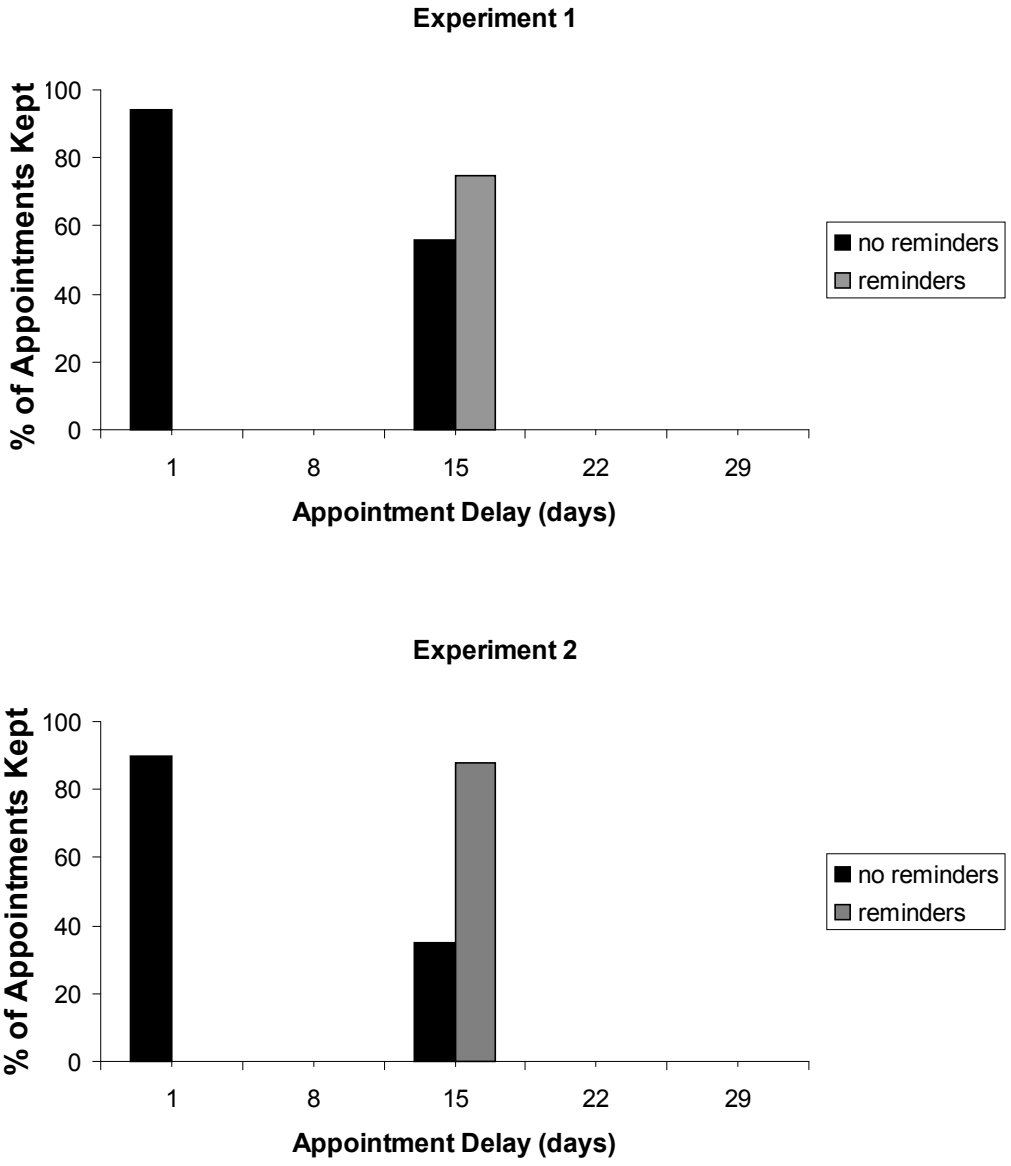
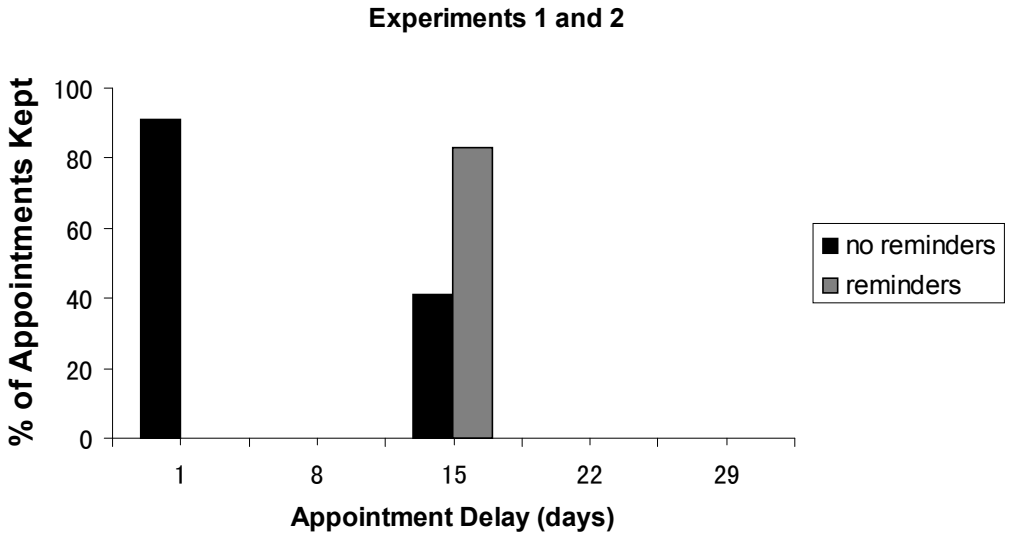


Figure 2 shows that when the data of Experiments 1 and 2 were combined, 91% (42 out of 46) of the students kept their appointments when appointment delay was 1 day, while 41% (12 out of 28) of appointments were kept when appointment delay was 15 days without reminders. When the students with 15-day appointment delay were given phone reminders, the percentage of appointments kept was 83% (20 out of 24). One-tailed Fisher's exact tests showed that there was a significant difference between 1-day and 15-day delays with no reminders ($p < .001$). The tests also showed a significant difference between 15-day delays with and without reminders ($p = .002$) and no significant difference between 1 day with no reminders and 15 days with reminders ($p = .27$).

Figure 2. The combined data of Experiments 1 and 2. The figure shows the percentages of appointments kept in the 1-day and 15-day delay conditions as a function of appointment delay and reminders.



Direct vs. Indirect Reminders

When the experimenter called to give reminders, some students answered the phone (direct reminders). Others did not and the experimenter left a reminder message in their voice mailbox (indirect reminders). In Experiment 1, a total of 8 students were in the reminder condition, of which 5 received direct reminders and 3 indirect reminders. All 5 students (100%) with direct reminders kept their appointments, while 1 out of 3 students (33%) with indirect reminders did. In Experiment 2, 16 students were in the reminder condition. Seven out of 8 of students (88%) who received direct reminders kept their appointments. The numbers were identical for the students with indirect reminders; 7 out of 8 students (88%) kept their appointments.

Discussion

The results indicated a significant effect of appointment delay on appointment-keeping; more appointments were kept in the 1-day than in the 15-day delay conditions when phone reminders were not provided to the students. This inverse function of appointment delay was observed in both experiments. Although these outcomes were consistent with those of the previous studies (e.g., Benjamin-Bauman et al., 1984; Stark et al., 1990), the overall percentages of appointment-keeping were higher for both immediate and delayed conditions in the present study. This difference may be due to the difference in some properties of the consequences provided as a result of appointment-keeping in the present and previous studies, such as the amount and the certainty of those consequences.

The effect of phone reminders was significant in Experiment 2. While a similar trend was found in Experiment 1, the difference between the 15-day delay with reminders and with no reminders conditions was not significant. There may be several variables responsible for these inconsistent outcomes. First, the percentage of appointments kept was rather high in 15-day delay with no reminders in Experiment 1, probably partly due to the timing of the experiment in the semester. In the present study, receiving a 1-hr credit was not the primary goal for the participating students. Receiving the credit, in fact, served as a response resulting in the terminal consequence of a large behavioral chain, namely, passing the Psychology 101 course. When Experiment 1 took place towards the end of the semester, the contingency in the experiment, keeping the appointment and receiving credit, was closer to the terminal

consequence than in Experiment 2. That is, the value of the credit provided to the students may have been greater in Experiment 1, which in turn made the effect of appointment delay less significant. Second, since appointment-making was initiated by the students in Experiment 1, rather than the experimenter, the students' characteristics such as the level of motivation may have differed from those in Experiment 2. Finally, because of its small sample size, Experiment 1 may not have had sufficient power to detect a true difference between the conditions.

The effect of direct and indirect reminders on appointment-keeping behavior was assessed after the two experiments had been completed. While the results of Experiment 1 suggested that the probability of appointment-keeping would be higher with direct reminders than with indirect reminders, the percentage of appointment-keeping was identical with direct and indirect reminders in Experiment 2. This inconsistency in the outcomes, again, may be attributed to the small sample size in Experiment 1.

Experiment 3

From the results of Experiments 1 and 2, it was unclear whether the function of appointment delay would be linear across the entire range of appointment delay, or the reduction of appointment-keeping would reach an asymptote at some point before or after the 15-day delay condition. In other words, although there was a reduction in appointment-keeping in the 15-day delay condition, the shape of the inverse function of appointment delay was not yet established. To investigate this, Experiment 3 was conducted with Psychology 101 students with an increased number of delay conditions.

To maximize the number of participating students, the timing of the experiment in the semester and recruitment procedure were carefully determined. First, the experiment was conducted at the beginning of the semester, so a great number of students had not yet completed their research requirements and would be available for the present experiment. Second, the initial appointment-making procedure was identical to the one in Experiment 2. It was predicted that the response effort for writing names on the sign-up sheets would be lower than contacting the experimenter by phone, hence the procedure would give more students the opportunity to express their interests in participating in the experiment.

Method

Setting, Participants, and Recruitment Procedures

The third experiment was conducted in the Spring 2007 semester (January 29th – May 17th). Participants were students from the Introductory Psychology course

(Psychology 101) at Queens College, who were required to fulfill a course requirement by either participating in some research studies or writing reports. The participants of the present study were given partial credit for the requirement. The recruitment procedure was identical to that of Experiment 2. On January 29th and 30th, Psychology 101 instructors distributed sign-up sheets in class, on which students who were interested in participating in the experiment wrote their names and phone numbers. One hundred fifty three students signed up, all of whom the experimenter called during the period of February 5th through 20th. The number of students who made appointments for experimental sessions is provided in Table 2 below.

Variables

As in Experiments 1 and 2, there were two independent variables. First, appointment delay had four conditions: 1, 8, 15, and 29 days. The students were randomly assigned into one of the conditions. The students in the 8-, 15-, and 29-day delay conditions were further divided into the reminder and no reminder conditions. The difference between these conditions and the definition of dependent variable were identical to those of Experiments 1 and 2.

Procedure

Initial calls. All the appointments were made for Tuesday, Wednesday, Thursday, or Friday due to the experimenter's availability. Therefore, the experimenter called the students Monday through Thursday. When the student did not answer the phone, the experimenter followed the same procedure as that of Experiment 2.

Appointment-making. As in Experiments 1 and 2, the experimenter called the

students who signed up for the experiments and told them: 1) the experimental session will take approximately 30 min; 2) there will be open time slots either tomorrow (1-day delay), in 8 days, in 15 days, or in 29days, depending on the condition into which the student was assigned; 3) the student can make an appointment anytime during a given 3- to 4-hr period; and 4) as a result of participation, the student will be awarded a 1-hr credit toward the Psychology 101 research requirement. The remaining part of the phone conversation was identical to that in Experiments 1 and 2.

Phone reminders. The procedure was identical to that of Experiments 1 and 2. Each student in the reminder conditions received a phone call 1 day (17 – 27 hrs) prior to the appointment date.

Experimental session. The procedure was also identical to the procedure in Experiments 1 and 2, with the exception of the way in which the partial credit for the Psychology 101 research requirement was provided to the students. Instead of giving a paper document, the experimenter went onto an online system designed especially for research studies using Psychology 101 students, found the student's name, and verified the student's participation in the study. This procedure was followed when the student signed the consent form, after which the experimenter told the student that s/he had received a 1-hr credit. None of the students withdrew from the study after debriefing.

Follow-up for broken appointments. The experimenter called the students who did not keep their appointments without canceling or rescheduling. The purpose of the follow-up calls was to interview the students concerning the reason for not showing for the appointments. Also, the broken appointments were to be rescheduled so that the

experimenter would notify these students of the purpose of the study and obtain their informed consent. If broken appointments were rescheduled with these students, their data would not be included in the experiment.

Results

Final Number of Participants

Table 2 shows the number of students who signed up to participate, made appointments, and were assigned into each condition in Experiment 3. Of 173 students who wrote their names and phone numbers on the sign-up sheets, 97 (56%) made appointments. Six students (4%) were not available on the suggested dates and 70 students (40%) did not return the experimenter's initial phone call. The number of students assigned to the 1-, 8-, 15-, and 29-day delay conditions, respectively, was 14, 28, 29, and 26. In the 8-, 15, and 29-day delay conditions, however, 3, 2, and 2 students, respectively, cancelled their appointments by phone prior to the appointment times. Therefore, the number of students in the 8-, 15-, and 29-day delay conditions was 25, 27, and 24, respectively.

The students in each of the 8-, 15, and 29-day delay conditions were divided into reminder and no reminder conditions as follows: 10 and 15 in 8-day delay; 13 and 14 in 15-day delay; and 10 and 14 in 29-day delay.

Table 2. The final number of participants in Experiment 3. In the right-hand column, R stands for Reminders and NR for No Reminders.

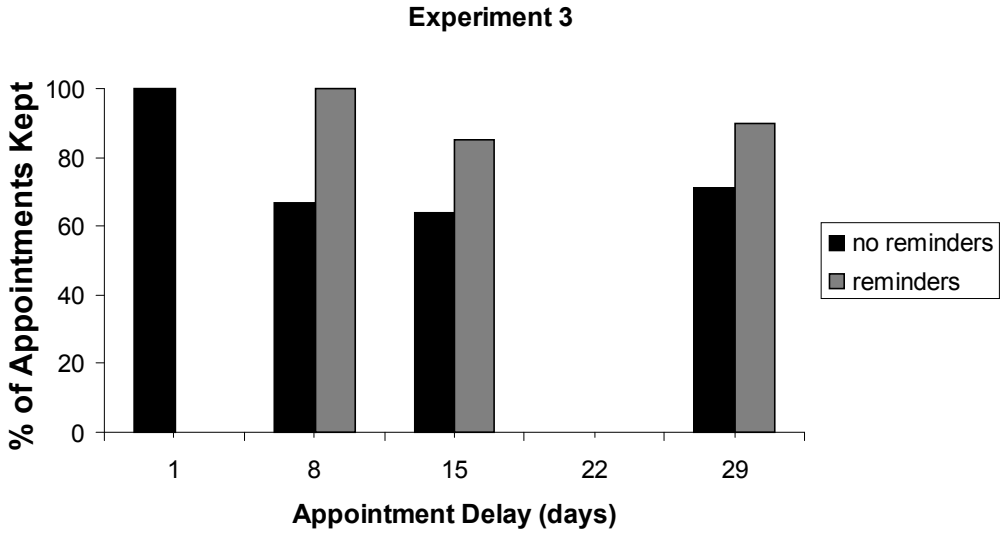
Called	Made Appts	Delays	Reminders
173	97 6 not available 70 not returned calls	1day - 14	NR - 14
		8 days - 25 3 cancelled	R - 10 NR - 15
		15 days - 27 2 cancelled	R - 13 NR - 14
		29 days - 24 2 cancelled	R - 10 NR - 14

Appointment Delay and Reminders

Figure 3 shows the percentages of appointments kept in Experiment 3. When the students were offered appointments for the next day, 14 out of 14, or 100% of the students kept their appointments. When the students were told to come in 8 days, 10 out of 15 students (67%) kept their appointment without reminders. The percentages of appointments kept for 15 and 29 days with no reminders were 64% (9 out of 14) and 71% (10 out of 14), respectively. When the students in 8, 15, and 29 days conditions were given reminders, the percentages increased to 100% (10 out of 10), 85% (11 out of 13), and 90% (9 out of 10), respectively.

A one-tailed Fisher's exact test showed a significant difference between 1-day delay and 8-, 15-, 29-day delays with no reminders ($p = .008$), but a chi-square test showed no significant difference among 8-, 15-, and 29-day delays with no reminders ($\chi^2 = .169$, $N = 43$, $df = 2$, $p = .919$). There was no significant difference among 8-, 15-, and 29-day delays with reminders, either ($\chi^2 = 1.633$, $N = 33$, $df = 2$, $p = .442$). In addition, a one-tailed Fisher's exact test showed no significant difference between 1-day delay with no reminders and 8-, 15-, 29-day delay with reminders ($p = .336$). Finally, as a result of a one-tailed Fisher's exact test, the difference between the reminder (8-, 15-, and 29-day delays) and no reminder (8-, 15-, and 29-day delays) conditions was significant ($p = .014$).

Figure 3. The percentages of appointments kept in the 1-, 8-, 15-, and 29-day delay conditions in Spring 2007 (Experiment 3).



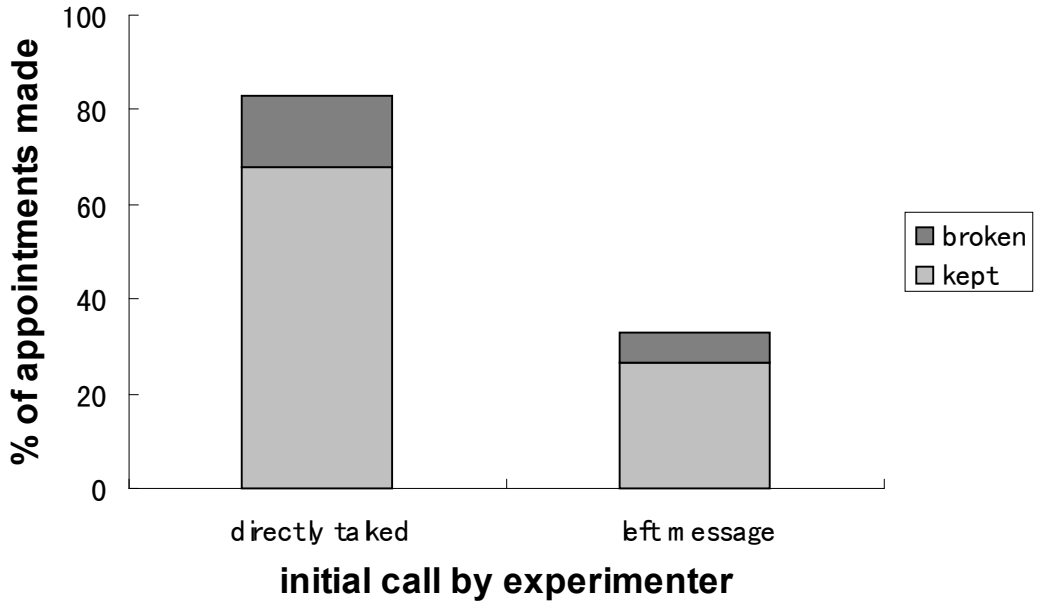
Sequence of Appointment-Making

When the experimenter initially called the student to make an appointment, she sometimes could not reach the student and left a message in the student's voice mailbox. Figure 4 shows the difference in the percentages of appointments made, kept, and broken with the students to whom the experimenter directly talked in the initial phone call, and other students for whom the experimenter left a message in their voice mailbox.

Of all the 173 students, 66 were directly talked to through the initial phone calls. Fifty five of the 66 students (83%) made appointments, 5 cancelled, and 6 were not available on the suggested appointment dates. Of the 55 students, 45 (82%) of those kept their appointments. The experimenter left messages in the voice mailbox for 107 students, 35 (33%) of whom made appointments, 2 cancelled, and 70 did not return the experimenter's initial calls. Of the 35 students who made appointments, 28 (80%) kept their appointments.

A one-tailed Fisher's exact test showed that significantly more students made appointments when they were directly contacted than when the experimenter left messages for them ($p < .001$). There was no significant difference, however, between appointment-keeping of directly contacted students and that of the students who received messages in their voice mailbox ($p = .519$).

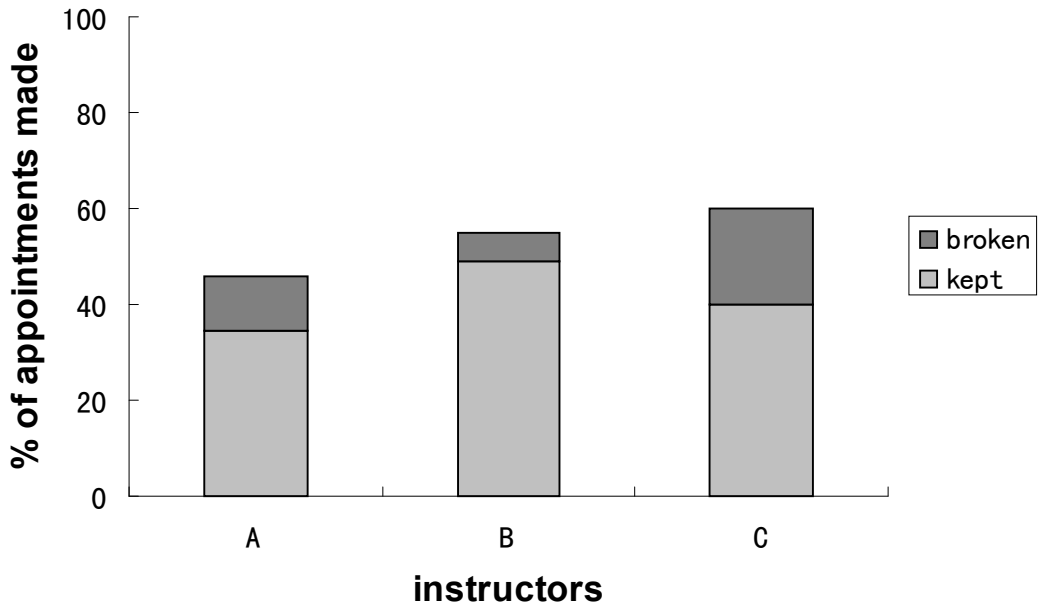
Figure 4. The percentages of appointments made when the experimenter directly contacted the students and left messages for them when she initially called to make appointments in Spring 2007 (Experiment 3). The percentages of appointments kept and broken in each are also shown.



Instructors

The students in the present study were from three different classes taught by three different instructors (Instructors A, B, and C). Figure 5 depicts the difference in the percentages of appointments made, kept, and broken across the instructors. The percentages of appointments made were 46%, 55%, and 60% for Instructors A, B, and C, respectively. The percentages of appointments kept were 75%, 89%, and 67%. Chi-square tests showed no significant differences among the three instructors as for the students' appointment-making ($\chi^2 = 1.644$, $N = 173$, $df = 2$, $p = .330$) or appointment-keeping ($\chi^2 = 4.345$, $N = 90$, $df = 2$, $p = .114$).

Figure 5. The percentages of appointments made by students from three classes taught by different instructors in Spring 2007 (Experiment 3). The percentages of appointments kept and broken in each are also shown.



Direct vs. Indirect Reminders

A total of 33 students were in the reminder condition, of which 18 received direct reminders and 15 indirect reminders. All 18 students (100%) with direct reminders and 12 out of 15 students (80%) with indirect reminders kept their appointments. There was no significant difference found as a result of a one-tailed Fisher's exact test (p = .083).

Follow-Up Calls for Broken Appointments

The experimenter called all the students who had broken their appointments. None of these students returned the calls.

Discussion

The results of Experiment 3 showed that appointment-keeping was 100% when the appointments were made for the next day. The percentage of appointments kept dropped as the appointment delay increased to 8 days; however, this detrimental effect of appointment delay did not differ among the delays of 8, 15, and 29 days. The outcome suggests that the reduction of appointment-keeping may reach an asymptote at some point between 1- and 8-day delays.

The effect of phone reminders to increase appointment-keeping was observed in the 8-, 15-, and 29-day delay conditions, but the effect was not significantly different across the three conditions. Further, appointment-keeping behavior did not significantly differ between the 1-day delay with no reminder condition and the three delay conditions with reminders. That is, regardless of the amount of appointment delay, phone reminders potentially raise the probability of appointment-keeping to the level with immediate appointments. These outcomes, however, may also indicate that a ceiling effect was present.

The results also showed that, even though appointment-keeping can be increased to a certain extent with phone reminders, delayed appointments are accompanied by the risk of losing participants. In Experiment 3, a total of 7 students, who were in 8-, 15-, or 29-day delay conditions, cancelled their appointments. This result is possibly due to the fact that as the time interval between appointment-making and the appointment date increases, the possibility of opportunities for competing behavior resulting in a consequence of the same or higher values to arise may also

increase. This outcome, again, suggests that immediate appointment is an optimal condition to increase the probability of appointment-keeping behavior.

There was a significant difference in appointment-making between the students who were initially contacted directly and those who initially received a message in their voice mailbox. A high percentage of the students in the latter group did not return the experimenter's initial call to make appointments, and one of the possible explanations for that outcome is an increased response effort. It was speculated, after the fact, that those who returned initial calls (i.e., made an extra effort) to make appointments might have had higher motivations, thus might have shown a higher percentage of appointment-keeping. However, a post-hoc analysis indicated that there was no systematic difference in appointment-keeping between the students who were initially contacted directly, and those who initially received a message and called back. These results indicate the importance of the caller directly contacting individuals to increase the number of appointments.

Another post-hoc analysis was conducted to assess the difference in the percentages of appointments made and kept across the students with different Psychology 101 instructors. Informal and unsystematic interviews of the instructors revealed that one instructor may have made encouraging comments about the research requirement in class more frequently than another. However, the results did not show any significant difference among the instructors in terms of their students' appointment-making and appointment-keeping behavior.

Lastly, the effect of direct and indirect reminders on appointment-making was

again analyzed. As in Experiment 1, although the 3 students who were in the reminder condition and broke their appointments received indirect reminders, there was no significant difference between appointment-keeping for direct and indirect reminders. The trend identified in Experiments 1 and 3, however, suggest that direct reminders might prevent the occurrence of broken appointments.

General Discussion

The present study found that appointment-keeping decreases as appointment delay increases. This outcome, replicated across all three experiments, also supported the results of previous studies that were conducted primarily in health-related settings (e.g., Folkins et al., 1980). Since the present study took place in a more controlled laboratory setting, the consistent outcome is an important addition to the literature. Further, the present study demonstrated that the inverse effect of appointment delay may reach an asymptote at some point between 1-day and 8-day delays. The three experiments also found that phone reminders can increase the probability of appointment-keeping behavior to the same level of immediate appointment, regardless of the amount of appointment delay. These findings have a highly practical value, since shortening of appointment delay, in real-life settings, may not be a realistic strategy for increasing the number of appointments kept.

Possible Explanations

In several previous studies, researchers conducted interviews with the individuals who failed to keep their appointments. For example, Noonan (1973) conducted follow-up interviews with adult clients who failed to keep their appointments for pre-psychotherapy sessions. The clients reported reasons including: no reason, improvement, anxiety, and denial of clinic contact. Turner and Vernon (1976) also reported the results of interviews with clients who did not keep their appointments at a mental health center. The clients gave reasons such as: problem solved, sick at time of appointment, moved, and forgot appointment. Further, Ross et al.

(1993) reviewed several studies on appointment-keeping and identified some variables associated with broken appointments including: high response effort, miscommunication, and forgetting. Some of these and the above-cited "reasons" are not necessarily counterintuitive as explanations for why appointment delay affects appointment-keeping. However, since most of them were based on the participants' self-reports, their validity may be questionable.

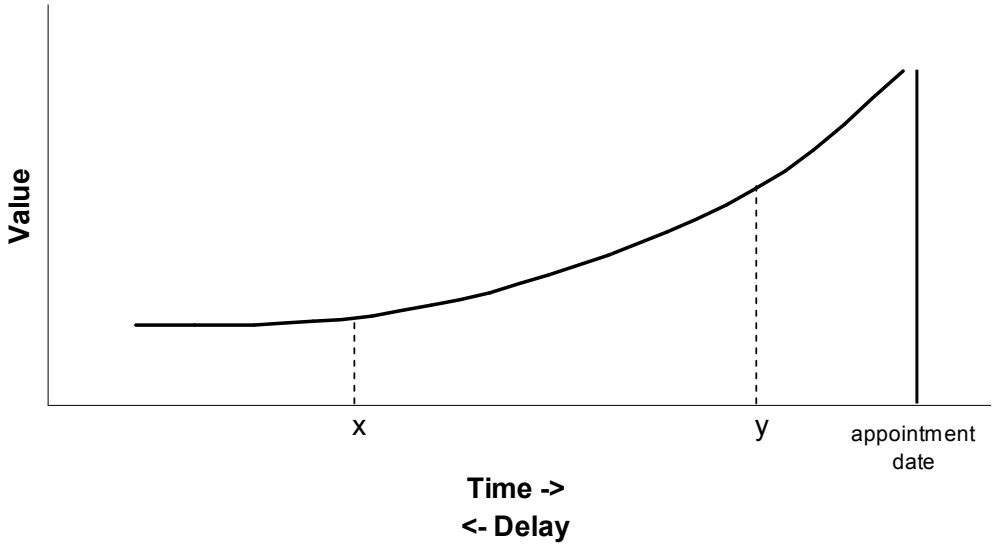
A Conceptual Model

The present study did not provide any molecular level of explanations, such as variables associated with appointment delay to which the results are attributed. The outcome of these parametric experiments, however, may be used as a basis of a model that depicts the effect of appointment delay on appointment-keeping. The hyperbolic function of appointment delay, shown in Figures 6 – 8, was generated using the model for delay discounting described by Mazur (1987). One apparent difference between the following figures and Mazur's model is that these figures show the change in value of an appointment across time, while the change in value of a future reward is shown in Mazur's.

Function of appointment delay. Other than appointment delay, variables that might have affected the probability of appointment-keeping were mostly held constant within each semester in the three experiments. These variables included the immediacy and certainty of the consequence of the target behavior. Additionally, the amount and quality of the consequence were the same or similar for all participants. With these in mind, a hypothetical gradient that illustrates the effect of appointment delay is shown

in Figure 6. The abscissa represents the time interval that elapsed after appointment-making; i.e., appointment delay. The ordinate represents the value of the appointment, which will be reflected in the probability of appointment-keeping. The solid vertical line indicates the appointment date, and the length of the line represents the amount of the consequence, or reward, provided as a result of appointment-keeping. The two letters on the abscissa indicate times at which appointments are made. When the appointment is made at point y (e.g., 2-day delay), the value of the appointment is higher than the value of the appointment made at point x (e.g., 7-day delay). Therefore, the probability of appointment-keeping is predicted to be higher at y than at x.

Figure 6. A hypothetical gradient representing the effect of appointment delay on the value of an appointment. The solid vertical line represents the amount of reward presented as a result of appointment-keeping. The letters x and y indicate two possible points at which the appointment is made. The value of appointment is higher when the appointment is made at y than at x.

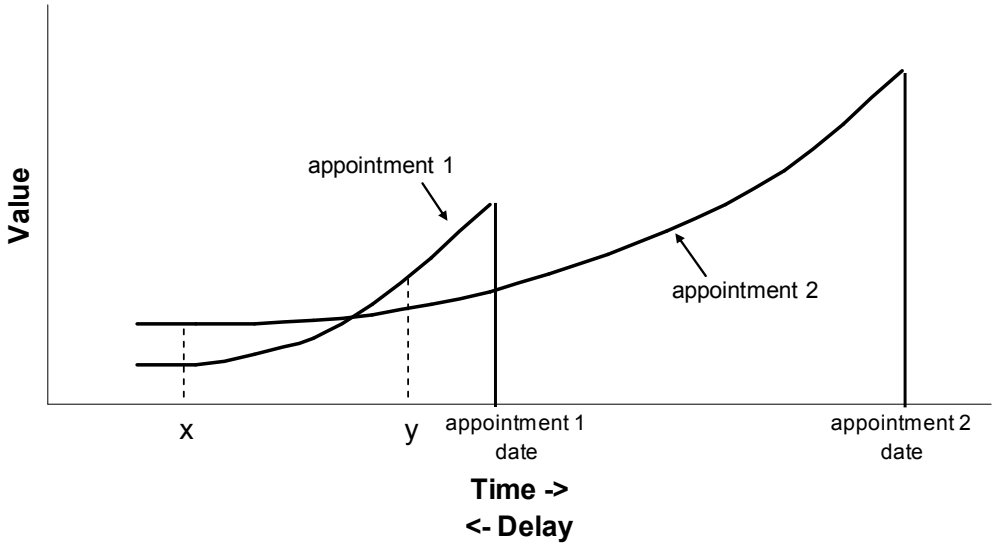


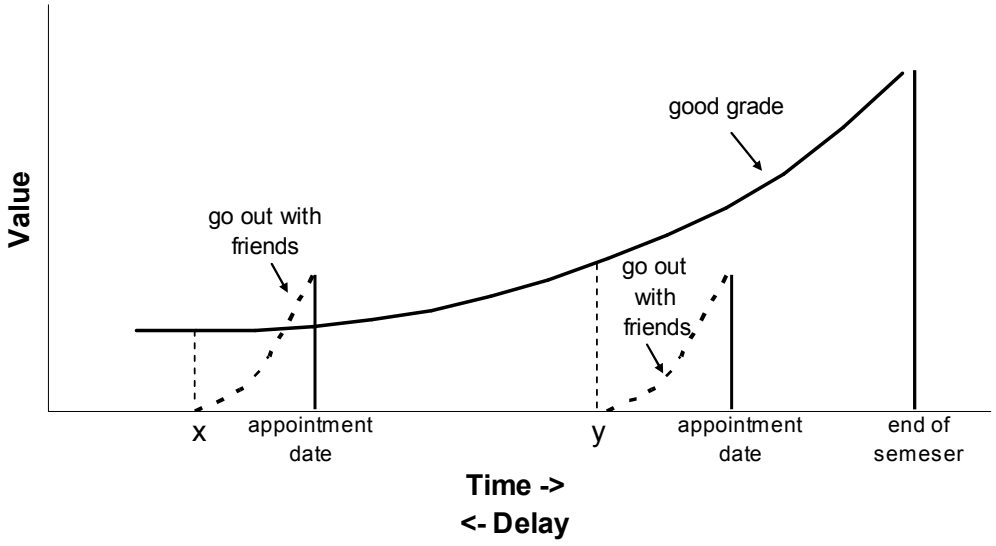
Choice-making situations. This model may be further refined by also considering the possibility of choice-making between keeping the appointment in question and exhibiting another response. Figure 7 shows two of such possibilities, which are similar to the self-control paradigm described by Logue (2000). The top panel depicts two hypothetical gradients, representing the effect of appointment delay on two appointments that take place on different dates and result in different amounts of consequences. The two solid vertical lines indicate that the amount of the consequence of Appointment 2 is larger (e.g., a 2-hr credit) than that of Appointment 1 (e.g., a 1-hr credit). When the two appointments are made at point x, the value of Appointment 2 is higher than the value of Appointment 1. That is, the probability of appointment-keeping is predicted to be higher for Appointment 2. However, when the appointments are made at point y, which is immediately followed by Appointment 1, it is highly probable that an individual chooses to keep Appointment 1 even though the amount of its consequence is smaller.

The bottom panel illustrates the change in the value of a good grade and the value of going out with friends. The long solid vertical line on the right shows the end of a semester and the length of it represents the amount of the consequence, or a good grade. The value of a good grade increases over time. Suppose that an individual makes an appointment at point x at the beginning of a semester for participating in a research project, which is a requirement for a good grade. When the appointment is made, the value of a good grade is higher than that of going out with friends, which is represented with the broken vertical line on the left. However, as the appointment date

approaches the value of going out increases and overrides keeping the appointment, which is depicted with the short solid vertical line on the left. Toward the end of the semester, however, the value of a good grade becomes higher. When an appointment for a research project is made at point y, an individual may choose to keep the appointment over going out with friends since the value of a good grade remains higher on the appointment date.

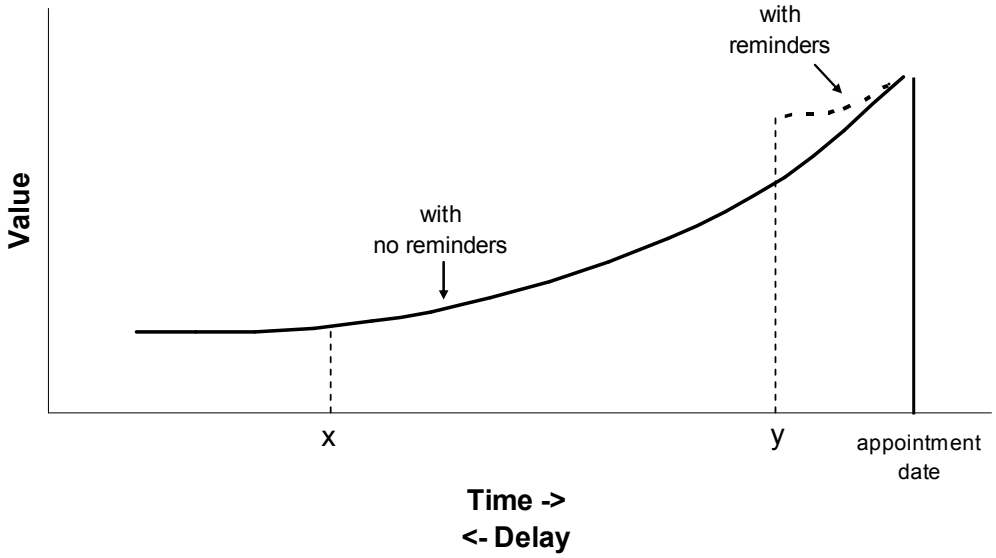
Figure 7. Hypothetical gradients representing the function of appointment delay in two choice-making situations. The top panel depicts how the values of two separate appointments may change over time. The bottom panel shows the change in the value of a good grade throughout a semester, and how an individual may or may not choose to go out with friends over keeping an appointment for a research project depending on the timing in the semester.





Reminder. Figure 8 includes hypothetical gradients that illustrate the effects of appointment delay with and without a reminder. When an appointment is made at point x, the value of the appointment is low and it is less likely that the individual keeps the appointment. The presentation of a reminder at point y, however, increases the value of the appointment as shown with the dashed line. This representation is compatible both with the results of the present study and with the results presented by Farmer and Schoenfeld (1966). In the laboratory study with pigeons, Farmer and Schoenfeld measured the response rate in a FI 60-sec schedule. In each interval, a 6-sec light was introduced twice. The second light always occurred immediately before the reinforcer, while the occurrence of the first light was systematically varied by gradually increasing the time between the first and second lights. The rate of responding drastically increased when the presentations of both first and second lights occurred. The researchers interpreted this that the light stimuli served a discriminative function to increase the response. In the present study, the statement given to the participant during appointment-making and the phone reminder probably were analogous to the first and second lights in Farmer and Schoenfeld, respectively. In both studies, the second stimulus occurred immediately preceding the target behavior and its consequence.

Figure 8. Hypothetical gradients representing the function of appointment delay on appointments with reminders and with no reminders. When an appointment is made at point x, the value of the appointment is low. When a reminder is provided at point y, the value becomes higher than when no reminder is given.



Suggestions for Future Research

Experiment 3 found a descending trend in appointment-keeping ends somewhere between 1- and 8-day appointment delays. Based on these results, a hypothetical model with hyperbolic gradients that depict the effect of appointment delay on appointment-keeping was presented. One question still remaining is the shape of the function of appointment delay before it reaches an asymptote. Additional research should investigate this issue.

There are also some questions concerning the effect of reminders. First, in the present study, phone reminders increased appointment-keeping to the same level as the 1-day delay condition, independent of appointment delay. That is, there was no interaction observed between the two variables, appointment delay and reminders. These results may indicate, however, that a ceiling effect was present because of some characteristics of the consequence of appointment-keeping. Compared to the consequence in the present study, the consequences of appointment-keeping in applied settings, such as talking to a counselor, the treatment of addiction, and improvement of mental health may be more delayed, less certain, and/or even aversive. Appointment delay and reminders may show different effects in such settings. Second, the effect of time intervals between reminders and appointment dates may also be researched in the future. The model suggested earlier that the phone reminders in the present study were effective in increasing appointment-keeping because they served as the second discriminative stimuli. According to the data observed by Farmer and Schoenfeld (1966), reminder may be more effective when the interval between a reminder and the

appointment; the reminders in the present study were successfully used for increasing appointment-keeping possibly because they were provided 1 day prior to the appointments. Future studies that manipulate the interval between reminder and appointment will further assess the compatibility between the function of reminders and that of the second light stimuli in Farmer and Schoenfeld. The outcomes of such studies may be useful in revising the model for the effects of appointment delay and reminders. Future research will also be an important addition to the previous studies on appointment-keeping, such as the study that manipulated the frequency of reminders (Lombard, Lombard, & Winett, 1995) and the study to investigate the effect of reminders provided through different media (Carrion, Swan, Kellert-Cecil, & Barber, 1993).

Conclusion

The effect of appointment delay on appointment-keeping, observed previously in health-related settings, was also observed in a laboratory setting. The present study also investigated the effect of phone reminders, which did not show an interaction with appointment delay. Further, the results of these parametric experiments were used as the groundwork for conceptualizing the effect of appointment delay and reminders as a modified delay discounting model. The model, however, requires further refinement, which depends largely on future research on appointment-keeping.

Appendix A

PSYCHOLOGY 101 STUDENTS are wanted for a research project on volunteer work!

- Students must be **18 or older** to participate.
- The entire session, consisting of a short interview/questionnaire, will take approximately **30 minutes**.
- The participant will be awarded a **1-hour credit** toward the Psyc101 Research Requirement.

Mari Watanabe
(646)346-4106 (NSB A311)

PLEASE WRITE YOUR NAME AND PHONE # BELOW IF YOU ARE INTERESTED. THE RESEARCHER WILL CONTACT YOU.

Name (Print)	**Phone Number**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Appendix B

Queens College, City University of New York
65-30 Kissena Blvd. Flushing, NY 11367
CONSENT TO SERVE AS A PARTICIPANT IN A RESEARCH PROJECT

Project Title: The Effects of Appointment Delay and Reminders on Appointment-Keeping Behavior of College Students

Research Investigator: Mari Watanabe (Science Building A311; 646-346-4106)
Research Advisor: Peter Sturmey, Ph.D., Psychology Department

You are being asked to participate in a research project conducted through Queens College, City University of New York. If you decide to participate, Queens College requires that you give your signed authorization to participate in this research project. A basic explanation of the project is written below. Please read this explanation and discuss it with the Research Investigator. If you then decide to participate in the research project, please sign the second page of this form.

The approval stamp on this consent form indicates that this project has been reviewed and approved for the period indicated by the Queens College Institutional Review Board for the Protection of Human Subjects in Research and Research Related Activities. If you have any questions about your rights as a research participant, or to report a research related injury, you may call: **Assistant Director of Regulatory Compliance, Queens College, CUNY, Phone (718) 997-5415.**

If you have concerns or questions about the conduct of this research project, you may call: **Peter Sturmey, Ph.D., Psychology Department, Queens College, CUNY, Phone (718) 997-3257.**

PURPOSE:

I understand that the Research Investigator is asking me to take part in ***a study to investigate the effects of appointment delay and reminders on appointment-keeping behavior of college students****. The investigator wants to know whether more appointments will be kept if the college students are seen sooner. Also, it is tested whether giving appointment reminders to students will increase the percentage of appointments kept by the students.*

The Research Investigator explained to me that the results of the study will be used for future research on how to recruit individuals to community-based volunteer programs.

PROCEDURES:

The Research Investigator records whether or not the student showed up for the appointment. I also understand that the Research Investigator noted the contents of the telephone conversation I had with her when I called to make the appointment.

If I choose to take part in the study, I will be awarded a 1-hour credit *and my responses recorded as above will be used as data in the study. The credit will be given regardless of the contents and quality of my responses.* ***My participation is completely voluntary. If I choose not to take part, there will be no penalty.***

POTENTIAL DISCOMFORT AND RISKS:

I understand that there will be no discomfort or risks expected in this study.

BENEFITS:

The results of the study will be used for future research on how to recruit individuals to community-based volunteer programs. Therefore, the present study will bring benefits to the community.

CONFIDENTIALITY:

My responses will remain confidential. *My data will be stored in a secure area with a coded ID number, so that my records will be safe and unidentifiable. Only the primary investigator and her research advisor will have access to the data.*

WITHDRAWAL FROM THE PROJECT:

I can decide to withdraw from the study at any time without penalty. *If I choose to withdraw, I understand that I will receive some credit, but not full credit, toward the Psychology 101 Research Requirement, and that I may participate in other studies or write a research report to fulfill the requirement.*

By signing this consent form, I agree to participate in this research project. The purpose, procedures to be used, and the potential risks and benefits of my participation have been explained to me. I can refuse to participate or withdraw from this research project at any time without penalty. Refusal to participate in or withdrawal from this study will have no effect on any services I may otherwise be entitled to from Queens College, CUNY. I will be given a copy of this consent form.

_____	_____	_____ _____
Printed Name of Participant	Participant Signature	Today's Date
_____	_____	_____
Printed Name of Investigator	Signature of Investigator	Today's Date

Institutional Review Board Approval Stamp:

Bibliography

Benjamin-Bauman, J., Reiss, M. L., & Bailey, J. S. (1984). Increasing appointment keeping by reducing the call-appointment interval. *Journal of Applied Behavior Analysis. 17,* 295-301.

Carrion, P. G., Swan, A., Kellert-Cecil, H., & Barber, M. (1993). Compliance with clinic attendance by outpatients with schizophrenia. *Hospital and Community Psychiatry, 44,* 764-767.

Farmer, J., & Schoenfeld, W. N. (1966). Varying temporal placement of an added stimulus in a fixed-interval schedule. *Journal of the Experimental Analysis of Behavior, 9,* 369-375.

Festinger, D. S., Lamb, R. J., Kirby, K. C., & Marlowe, D. B. (1996). The accelerated intake: A method for increasing initial attendance to outpatient cocaine treatment. *Journal of Applied Behavior Analysis, 29,* 387-389.

Folkins, C., Hersch, P., & Dahlen, D. (1980). Waiting time and no-show rate in a community mental health center. *American Journal of Community Psychology, 8,* 121-123.

Friman, P. C., Finney, J. W., Rapoff, M. A., & Christophersen, E. R. (1985). Improving pediatric appointment keeping with reminders and reduced response requirement. *Journal of Applied Behavior Analysis, 18,* 315-321.

Gottesfeld, H., & Martinez, H. (1972). The first psychiatric interview: Patient who do and do not come. *Psychological Reports, 31,* 776-778.

Greenspoon, J. (1997). Compliance, health service, and behavior analysis, In P. A.

Lamal (Ed.), *Cultural contingencies: Behavior analytic perspectives on cultural practices* (pp.31-52). Westport, CT: Praeger.

Grieves, R. E. (1973). An analysis of service delay and client variables as they relate to mental health center pre-therapy dropout. *Dissertation Abstracts International, 34,* 2126B

Logue, A. W. (2000). Self control and health behavior. In W. K. Bickel & R. E. Vuchinich (Eds.), *Reframing health behavior change with behavioral economics* (pp.167-192). Mahwah, NJ: Lawrence Erlbaum.

Lombard, D. N., Lombard, T. N., & Winett, R. A. (1995). Walking to meet health guidelines: The effect of frequent prompting frequency and prompt structure. *Health Psychology, 14,* 164-170.

Mazur, J. E. (1987). An adjusting procedure for studying delayed reinforcement. In M. L. Commons, J. E. Mazur, J. A. Nevin, & H. Rachlin (Eds). *Quantitative analysis of behavior: Vol. 5. The effect of delay and of intervening events on reinforcement value* (pp. 55-73). Hillsdale, NJ: Lawrence Erlbaum Associates.

Noonan, J. R. (1973). A followup of pretherapy dropouts. *Journal of Community Psychology, 1,* 43-44.

Robin, A. (1976). Rationing out-patients: A defence of the waiting list. *British Journal of Psychiatry, 128,* 138-141.

Ross, L. V., Friman, P. C., & Christophersen, E. R. (1993). An appointment-keeping improvement package for outpatient pediatrics: Systematic replication and component analysis. *Journal of Applied Behavior Ana*lysis, *26,* 461-467.

Slaikeu, K., Lester, D., & Tulkin, S. R. (1973). Show versus no show: A comparison of referral calls to a suicide prevention and crisis service. *Journal of Consulting and Clinical Psychology, 40,* 481-486.

Stark, M. J., Campbell, M. J., & Brinkerhoff, C. V. (1990). "Hello, may we help you?" A study of attrition prevention at the time of the first phone contact with substance-abusing clients. *American Journal of Drug and Alcohol Abuse, 16,* 67-76.

Stern, G. & Brown, R. (1994). The effect of waiting list on attendance at initial appointments in a child and family clinic. *Child Care, Health and Development, 20,* 219-230.

Tucker, J. A. & Davison, J. W. (2000). Waiting to see the doctor: The role of time constraints in the utilization of health and behavioral health services, In W. K. Bickel & R. E. Vuchinich (Eds.), *Reframing health behavior change with behavioral economics* (pp.219-264). Mahwah, NJ: Lawrence Erlbaum.

Turner, A. J. & Vernon, J. C. (1976). Prompts to increase attendance in a community mental-health center. *Journal of Applied Behavior Analysis, 9,* 141-145.