

## INCREASING APPOINTMENT KEEPING BY REDUCING THE CALL-APPOINTMENT INTERVAL

JOANNE BENJAMIN-BAUMAN, MAXIN L. REISS, AND JON S. BAILEY

FLORIDA STATE UNIVERSITY

We examined the effect of reducing the interval between a patient's call for an appointment and the appointment itself. In Experiment 1, patients calling a family planning unit of a public health department were assigned appointments within either 1 or 3 weeks of their call. Data on patient "shows" and "no-shows" were recorded weekly for 6 weeks. Show rates for those in the 1-week appointment group were significantly higher than those in the 3-week group. In Experiment 2, patients were assigned to appointment dates either the next operating clinic day (next-day group) or 2 weeks from the call date (2-week group). Show rates for those in the next-day group were significantly better than show rates for patients in the 2-week group. Clinic productivity, time spent with patients, and consumer satisfaction were also assessed. Implications for appointment scheduling are discussed.

DESCRIPTORS: compliance, appointment keeping, public health, antecedent control, call-appointment interval.

As a result of funding cutbacks, managers of public institutions and, in particular, medical facilities are becoming increasingly aware of the need to increase the efficiency of their services and to maximize the use of their staff (Schroeder, 1973; Shonick & Klein, 1977). Broken appointments at these facilities are not only expensive in terms of underutilized medical personnel but can affect the efficiency and scope of outpatient services. Surveys of appointment failures in outpatient, nonprivate clinics show that fail rates range from a low of 19% (Alpert, 1964) to a high of 52% (Nazarian, Mechaber, Charney, & Coulter, 1974).

Researchers who have attempted to modify rates of appointment keeping have investigated a number of variables. Decreased clinic "waiting-time," for example, has been associated with an increase in appointments kept (Finnerty, Mattie, & Finnerty, 1973). Reminders, either mailed or delivered by phone, have been shown to improve appointment "keep" rates by 30% to 70% (Nazarian et al., 1974; Turner & Vernon, 1976). Appointment

keeping rates have also been shown to improve when incentives were combined with letter prompts (Reiss, Piotrowski, & Bailey, 1976). Haynes (1976) provides a review of these and other procedures on improving appointment compliance.

One of the simplest and least expensive scheduling interventions is to reduce the time elapsed between scheduling the appointment and the appointment itself. Although several researchers have found that the call-appointment interval is unrelated to appointment keeping (Alpert, 1964; Gates & Colborn, 1976; Schroeder, 1973), other researchers indicate that this interval may be an important variable affecting the rates of kept appointments. As a by-product of a study designed to examine the effects of mailed appointment reminders, Nazarian et al. (1974) found that patients scheduled 12-28 days in advance of their appointments had a keep rate of 50%-56% whereas those scheduled 29-35 days away had a keep rate of only 33%. Hoffman and Rockhart (1969) also found a positive relationship between the call-appointment interval and no-show rates. Finnerty, Shaw, and Himmelsbach (1973) screened 6,480 persons for hypertension. Those individuals with blood pressure readings in the hypertensive range were referred for appointments to verify the blood pressure readings. When these patients were

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scheduled for verification appointments 1–2 weeks away; 50% did not keep their appointments. Although not experimentally verified, the authors stated that “subsequent experience” suggested that when verification appointments were scheduled 1–2 days away that there was a reduction in the incidence of no-shows to less than 5%.

Although these data suggest that reducing the appointment interval decreases the no-show rate, it is important to note that none of the authors experimentally manipulated the variable of the call-appointment interval. In our study, two experiments were designed to investigate the effect of reducing the call-appointment interval on appointment-keeping in a public health department family planning clinic.

## EXPERIMENT 1

### METHOD

#### *Patients and Setting*

Subjects were 337 patients of the Leon County Health Department Family Planning Clinic in Tallahassee, Florida. All patients had called to arrange an appointment for an annual gynecological exam.

The population of persons using Family Planning services had a mean age of 22 and a mean income of \$8,700 per year. Services at the Family Planning Clinic were provided free of charge. Appointments were not specific to a physician. The average show rate at the clinic for the 10 weeks prior to the implementation of Experiment 1 was 58.8%. At the onset of this experiment, the waiting time between scheduling an appointment and the appointment itself was approximately 3 weeks. Personnel at the clinic had requested help with their appointment keeping problems. Appointments at the Family Planning Clinic were assigned in appointment time blocks, i.e., between four and eight persons were assigned to the same appointment time.

#### *Procedure*

The Family Planning clerk responsible for scheduling appointments assigned patients to either

an appointment within 1 week of their call (1-week group) or to a call-appointment interval of 15–21 days (3-week group).

To assess the effects of a 1-week call-appointment interval, 12 appointments per week were added to the existing appointment logs (four each on Monday, Tuesday, and Thursday). These slots were reserved for patients who were given an appointment within 7 days from the time they called to request a physical exam. When the patient accepted an appointment within that week, her name was placed on a specially marked section of the appointment log. These appointments were offered until all 12 slots within a week of the call date were filled. Patients who called in after these 1-week appointments were filled, were given appointments 15–21 days later (i.e., assigned to the 3-week group).

On each day of Experiment 1 all files of persons with appointments that day were brought to the Family Planning Clinic. When the patient arrived the file was given to the Community Health Worker who conducted a preexam interview. The patient's weight, height, and blood pressure were recorded, and a urine sample was taken. The patient then received the physical exam and a post-exam interview. For each of the above steps, an entry was made in the patient's file. The entry included a date and a short written note on the results on each of the subcomponents of the exam.

#### *Behavior Definitions and Observation System*

A patient was considered a “show” if she came to the clinic on the appointed day to receive a gynecological exam. A patient was considered a “no-show” if she did not appear for her appointment. Patients who called to cancel their appointments at any time prior, and up to the scheduled appointment time, were considered a “cancellation.” A count of the total number of cancellations was kept.

Data on patient “shows” and “no-shows” were recorded by the Family Planning clerk. She indicated when a patient had “shown” by circling the patient's name on the appointment logs. Patients

who were "no-shows" were left uncircled. Cancellations were indicated by the clerk's crossing out the patient's name and writing the word "cancellation" across the name.

*Reliability*

Reliability checks were made by one of us (JBB), who checked the patient files of one-half of the scheduled appointments during any 1 week. If a patient's name had been circled on the attendance log, an agreement was scored if there was a file entry indicating that a physical exam on that date had been completed. An agreement was also scored if the attendance log indicated that a patient was a "no-show" and there was no entry in that patient's file indicating a physical exam on that date. A disagreement was scored if the attendance log information differed from the information found in the file.

RESULTS AND DISCUSSION

*Reliability*

Reliability data were collected for 178 of the 337 patients (53%) participating in Experiment 1. Using the exact agreement method, nonoccurrence reliability (no-show data) was 100% for both the 3-week and 1-week groups. Occurrence reliability (show data) was 96% for the 1-week group and 99% for the 3-week group. In the two instances in which file data differed from data on the appointment sheet, the patients arrived for an appointment but did not receive physical exams because it had been less than 10 months since their last exam.

Observations of the appointment assignment system during the first week showed that all 12 appointments were assigned appropriately. During the 10 checks over the next 5 weeks, no appointments were found to have been scheduled more than 7 days in advance. By Tuesday of the first week all appointments for the first week had been assigned. By Wednesday afternoon of the first week appointments for Monday, Tuesday, and Wednesday of Week 2 had been assigned. Each week thereafter, checks on Tuesday and Thursday indi-

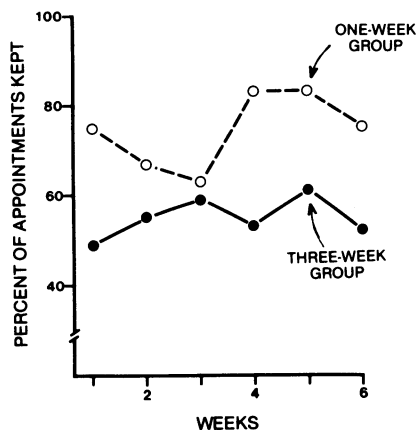


Figure 1. Percentage of appointments kept per week by patients in the 1-week and 3-week call-appointment interval groups.

cated that with only two exceptions, the call-appointment interval for those in the 1-week group was in fact 7 days.

*Appointment-Keeping Data*

Sixty-eight persons were assigned to the 1-week group and 269 to the 3-week group. Weekly show rate data for patients in the 1-week and 3-week groups are shown in Figure 1. Show rates for those in the 1-week group averaged 75% (range 62.5% to 83.3%) versus 57% (range 49% to 59%) for the 3-week group. A total of 11 persons called to cancel their appointments during Experiment 1. All had been assigned to the 3-week group. Data were analyzed using a  $\chi^2$  contingency. Differences in show rates for the two groups were statistically significant,  $\chi^2(1) = 7.46, p < .01$ .

The results of Experiment 1 demonstrated that when patients were scheduled for an appointment within 1 week of their call, show rates were significantly better than for patients with a 3-week call-appointment interval. These results, however, leave several questions unanswered. What would be the effect of further reducing the call-appointment intervals? Would increased show rates affect patient waiting time once at the clinic and would patients be seen for shorter amounts of time? Would clinic productivity increase? Experiment 2 was designed to answer these questions.

## EXPERIMENT 2

## METHOD

*Patients and Setting*

Participants were 192 patients calling the Leon County Health Department to schedule an appointment for an annual gynecological exam.

*Procedure*

Patients were assigned to either an appointment the next day (next-day group) or to an appointment 2 weeks from the call date (2-week group). Because the clinic did not take appointments on Wednesdays and was not open on the weekend, the call-appointment interval for those in the next-day group averaged 1.6 days. The call-appointment interval for those in the 2-week group was 15 days.

Fourteen additional appointment slots were added to the appointment log each week during this study, half reserved for patients in the next-day group and half reserved for those in the 2-week group. Each day during the study, the clerk was given a sheet of paper on which the order of group assignment was listed. A coin toss determined if the first appointment offered to a caller would be for the next day or for an appointment 2 weeks from that date. Group assignment alternated between next day and 2 weeks after that. Persons who turned down the first appointment offered by the clerk were offered another appointment at the first available time. These patients comprised a third group, the rejected-appointments group; their call-appointment intervals were variable.

*Consumer satisfaction survey.* A survey was administered to 20 patients in each of the three groups on their arrival at the Family Planning office for their appointment. Patients were asked which appointment scheduling system they preferred (next-day notice, 1-week notice, or 2-week notice). Patients were also asked to rate clinic services. Completion of the forms was voluntary and all respondents remained anonymous.

*Clinic productivity.* The average number of patients seen per week was calculated and used as a measure of clinic productivity. Because the vol-

ume of patients calling for appointments varied seasonally, these averages were compared with those during the same period 1 year prior.

*Time utilization survey.* A survey was administered to assess the amount of time a patient spent both waiting for and receiving Family Planning Services. Staff were instructed to record the time they began and finished with each of the subcomponents of the exam. These components included (a) the initial interview during which address and financial information were verified; (b) a height/weight and urine check; (c) a preinterview, during which any problems were discussed; (d) the exam, which included a pap smear and breast check; and (e) a postinterview, during which patients' questions were answered. The survey was administered on a Monday morning, Tuesday morning, and a Thursday afternoon during the sixth week of the experiment. These data were then compared with Monday morning, Tuesday morning, and Thursday afternoon data from a Time Utilization Survey conducted prior to the beginning of Experiment 1.

*Behavior Definitions, Observation, and Reliability*

Both the behavior definitions and the observation system used in Experiment 2 were the same as those used in Experiment 1. Reliability data were collected by checking the files of all experimental patients due on Monday and Thursday of one week and Tuesday and Friday of the following week. This system was used alternately for 8 weeks. Agreements and disagreements with information on the appointment logs were scored using the criteria described in Experiment 1.

To ensure adherence to the appointment scheduling system, clinic personnel were observed an average of two times per week. During each observation, the assignment of at least two appointments was observed.

## RESULTS AND DISCUSSION

*Reliability*

Reliability data were collected for 87 of the 192 patients (45%) participating in Experiment 2.

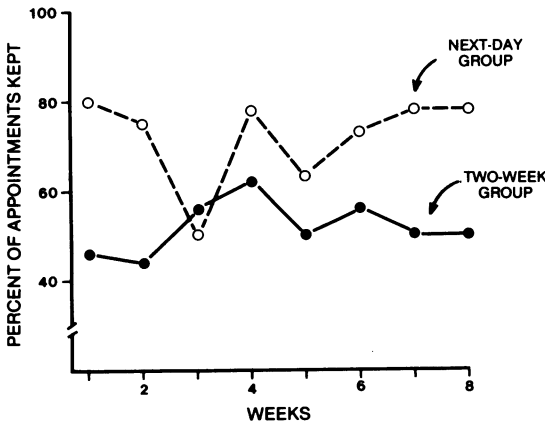


Figure 2. Percentage of appointments kept per week by patients in the next-day and 2-week call-appointment interval groups.

Nonoccurrence reliability (no-show data) was 100% for the next-day and 2-week groups. Occurrence reliability (show data) was 98% for the next-day group and 100% for the 2-week group.

Observations of the appointment assignment system included 49 calls during 20 separate observations; 48 of the 49 calls were assigned according to procedure. The one assignment error observed was corrected immediately.

*Appointment-Keeping Data*

Seventy-eight persons were assigned to the next-day group, 77 to the 2-week group, and 37 to the rejected-appointments group. Weekly show rate data for patients in the next-day and 2-week groups are presented in Figure 2. These data indicate that in 7 of the 8 weeks of the study, those in the next-day group had higher show rates than those in the 2-week group. Mean percent show rate across all 8 weeks for the next-day group was 72% (range 50% to 80%) versus 52% (range 44% to 62%) for the 2-week group. Differences in show rates for these groups were statistically significant,  $\chi^2(1) = 6.47, p < .05$ .

The overall mean show rate for the 37 persons in the rejected-appointments group was 54%. The mean call-appointment interval for this group was 10.7 days. Twenty-seven of the 37 persons in this group had rejected next-day appointments.

*Consumer Satisfaction Survey*

Patients in all three groups rated services of the Family Planning Clinic as average to excellent. When asked which scheduling system they would prefer, 47.4% of those in the next-day group preferred to call in for an appointment and get one the next day (the condition they encountered) whereas 52.6% indicated a preference for a scheduling system that would give them an appointment within 7 days of their call. None of the patients in this group indicated a preference for calling and getting an appointment within 2 weeks. Of persons sampled in the 2-week group, 16% preferred next-day appointments, 58% preferred appointments within 7 days, and 26% within 2 weeks (the condition they encountered). Of persons in the rejected-appointments group, 30% preferred next-day appointments, 65% 1-week appointments, and only 5% 2-week appointments.

*Clinic Productivity*

The average number of persons served per week 1 year prior to the scheduling intervention was 21.2. An average of 30.1 persons was served per week during the experiment, almost 9 more than had been served 1 year prior.

*Time Utilization Survey*

During Experiment 2, the time spent for each of the subcomponents of the Family Planning exam was less than during the preintervention sample. The initial interview averaged 3.5 minutes less, and the height, weight, and urine check 40 seconds less. The preexam and postexam interviews were shorter by an average of 4 minutes and 2 minutes, respectively. The physical exam itself was shorter by an average of 10 seconds. The average length of patient contact during intervention was, therefore, approximately 10.5 minutes shorter than during the preintervention sample. Nearly 30% of this difference, however, is attributed to reduced time during the initial interview, during which address and financial information was gathered. Time spent in the physical exam itself was essentially the same prior to and during the scheduling intervention. Average waiting time for these clinic services

before intervention was 37.9 minutes, compared with 43.9 minutes during intervention.

The results of Experiment 2 indicate that when patients were scheduled for an appointment within an average of 1.6 days after their call for an appointment, 72% of the appointments were kept. This was contrasted with a 53% show rate for those with a 2-week call-appointment interval. With an average call-appointment interval of almost 11 days, show rate data from the rejected-appointments group averaged 54% across all 8 weeks; this was slightly higher than the show rate for the 2-week group. Because members of the rejected-appointment group selected their own appointment time, these patients represent a different population than the next-day and 2-week group participants and must be seen as a comparison group, not a control group.

The data from Experiment 2 indicate that the increased show rate led to an increase in productivity for the clinic, only a slight increase in waiting time, and a slight decrease in direct service time to the patients. Although the time spent for the actual gynecological pelvic exam remained about the same, the average time spent in pre- and postexam interviews was decreased. These interviews are used to gain information before the exam and to answer questions after. These data, however, may not represent simply the effect of the appointment scheduling intervention. At the Leon County Health Department the same pool of staff members serves clients from each of five clinics. During the last 4 weeks of Experiment 2, the Health Department began a program in conjunction with the state to provide mandatory immunizations to school-aged children. As a result, many more children came to the Health Department for vaccinations than was typically the case. The immunization program may have had a spillover effect on the waiting and service delivery time for patients at the Family Planning Clinic. If, however, the decreased service time was due directly to increased show rates for patients at the Family Planning Clinic, the quality of care could be affected; such issues would need to be considered in future research.

## GENERAL DISCUSSION

This investigation adds to the growing body of research suggesting that appointment keeping decreases with increasing delays. These results are important, however, because they represent not correlational data but the only systematic investigation that specifically varied the call-appointment interval and did so at an interval less than 7 days.

Although Experiments 1 and 2 were conducted in winter and spring, respectively, and the patients were assigned in a slightly different fashion, the patients were drawn from the same population. Although caution must be exercised when combining data from these two experiments, doing so can be important in identifying trends to be investigated at a later date. When data from Experiment 1 are considered along with results from Experiment 2, appointment-keeping rates at this clinic were between 72% and 75% for call-appointment intervals less than 1 week and between 53% and 57% for intervals of 2 to 3 weeks. There appears to be little advantage, therefore, in arranging appointments the next day compared to 1 week away. Differences between the next-day and 1-week group were not statistically significant ( $\chi^2 = 0.19$ ). Differences between the 2-week and 3-week groups were also not significant ( $\chi^2 = 0.61$ ). When show rate data for the next-day and 1-week groups were combined, however, and compared to the combined data for the 2-week and 3-week groups, the differences were significant,  $\chi^2(1) = 13.26$ ,  $p < .01$ . This represents a significant difference in show rate for persons with a 1–7 day versus 14–21 day call-appointment interval. The drop-off in appointment-keeping rates appears to occur between the 8th and 14th day. What implications do these data have for appointment scheduling, and how can the results of this study translate into practical solutions to the appointment-keeping problem? Most simply, a clinic should attempt to make appointments within 7 days of a request. Once appointments are filled, extra staff could be assigned to that clinic until the appointment backlog was less than 7 days. If appointment backlogs

consistently require additional backup staff, then it is obvious that the clinic needs additional personnel on a permanent basis. The dollar cost of adding personnel must be balanced against the social cost that results from persons not being part of the Family Planning health care delivery system. These social costs are a financial burden to the community in terms of unwanted births and undetected disease.

In medical settings concerned with appointment keeping, reducing the call-appointment interval could result in increased funding from kept appointments and could save time associated with broken appointments (record keeping, physician idle time). Research efforts must be directed toward tipping the balance in favor of appointment keeping, while keeping costs low and service quality and consumer satisfaction high.

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