Do Text Message Reminders Impact Appointment Behaviors for Individuals under Community Supervision?

Michael Ostermann, Ph.D.

Associate Professor

School of Criminal Justice

Rutgers, The State University of New Jersey

Jordan M. Hyatt, J.D., Ph.D.

Associate Professor

Department of Criminology and Justice Studies Drexel

University

BACKGROUND

Approximately 4.4 million American adults are under community supervision, more than double the number of individuals incarcerated (Maruschak & Minton 2020). Despite providing the majority of correctional supervision, community supervision agency budgets have not grown in proportion to the increases in their caseloads (Petersillia 1997). This has encouraged an emphasis on efficiency, resource management, and innovation in community supervision.

During their term of supervision, most individuals are subject to conditions that mandate the frequency and nature of contact with the officer(s) assigned to manage their case. These interactions often take place at an agency office, where the individual under supervision can provide updates, receive support and treatment, and be tested for recent drug use. These visits are the keystone of effective supervision (Lindner 1992).

Despite their importance to effective supervision management, office visits are often difficult to coordinate resulting in high numbers of missed appointments due to work, education, or an inability to travel to the location of the office meeting. This is especially true for higher-risk individuals (Hyatt and Barnes 2017), for whom missed appointments can result in an officer requesting the revocation of probation and returning people to prison (Medina 2017).

Probation agencies across the United States have embarked on a number of initiatives to increase compliance with the requirements of supervision, including attempts to increase attendance at office meetings. Technological innovation has played an increasingly important role in these initiatives.

This report summarizes an evaluation of the approach taken by the Arkansas Community Corrections (ACC) agency to increase the rate at which individuals on supervision attend their required office visits. In the below sections, we provide an overview of the setting in which this assessment took place, the guiding research questions, and the methodology employed. We conclude with a summary of the findings.

SETTING

Community supervision in Arkansas requires that individuals under supervision have a quarterly office visit with their probation/parole officer. These appointments are missed about 20% of the time, limiting the opportunity for prosocial contact, potentially resulting a violation and, in most cases, wasted time and effort for officers with already overburdened caseloads.

To reduce the number of missed appointments, ACC contracted with Marquis Software to enhance its Offender Management System to increase the capacity of its Case Management System (CMS). Among other changes, the revised system allowed the supervision agency to send text message reminders direct to offenders using contact information gathered by the agency and by the courts.

RESEARCH QUESTION:

This evaluation was designed to assess two primary research questions:

1) Do text message appointment reminders impact the number and rate of held, canceled, and no-show appointments for community supervision participants?
2) Does the frequency and/or timing of text message reminders impact effectiveness?

METHOD

To best isolate the effect of the text message reminders on the behaviors of individuals under supervision, a design akin to a randomized controlled trial (RCT) was employed. By leveraging the gradual roll-out of the text message reminder technology, causality can be established. This is important as RCTs are regarded as the "gold standard" of evaluation design and the ideal approach for policy assessment in the social sciences (Farrington et al. 2019).

Treatment Groups

In order to approximate random assignment, individuals under community supervision (probation and/or parole) and supervised by ACC during the roll-out and evaluation period were assigned via lottery to one of four groups, each receiving various levels of appointment text message reminders. The study began on October 1, 2018 and concluded on April 15, 2019.

The treatment for the four groups was as follows:

• Group 1: a text *two days* before the appointment ("*early text*")

• Group 2: a text *one day* before the appointment ("*late text*")

• Group 3: texts *one day* and *four days* before the appointment ("*two texts*")

• Control Group: no texts

Data

Marquis Software used the ACC's Offender Management System (OMS) to send text message reminders to offenders depending on their group assignment. Implementation and fidelity data were later drawn from their software portal(s). Additionally, background and covariate data for between-group balancing at baseline, as well as outcome data, were derived from the OMS (matched on date and a unique client identification number). These data were provided to the research team to conduct the external, independent analysis.

Background characteristics include individual-level data about participant age at the start of the evaluation, sex, race, supervision assignments, risk levels, term length of community supervision, and the amount of time elapsed between the start of the individuals' supervision and the beginning of the evaluation. Dependent variables include the total number of appointments assigned to individuals categorized as held, canceled, or no shows.

Statistical Approach

The statistical methodology employed in this analysis uses a one-way analysis of variance (ANOVA) to examine continuous variables (e.g., counts and scales) and chi-square analyses for categorical variables (e.g., binary variables). This approach allows for the comparison of all of the groups simultaneously. Multivariate statistics were not necessary given the successful implementation of the treatment assignment protocol detailed above.

In addition to comparing the data directly extracted from the CMS, (e.g., the average number of appointments between the four groups), several additional variables are calculated for this analysis. These include the average rates of held, canceled, and no-show appointments.

RESULTS Descriptive Statistics

On average, the sample was approximately 37 (SD=11.09) years old on the date of the start of the experiment, about 73% of the sample is male, 31% are black and 66% are white. About 42% are assigned to parole and 58% are assigned to probation. Risk classifications include 1% of the sample being assigned to annual, 6% to maximum, 37% to medium, and 56% to minimum. The sample was assigned to serve, on average, about 2,200 (SD=1,657.97) days on community supervision and served approximately 720 (SD=622.40) days of supervision before being enrolled in the study.

The total sample (n=4,000) was evenly assigned to equally sized groups (n=1,000) across the control condition and the three different treatment dosage groups. As shown in Table 1, the assignment protocol successfully resulted in the creation of four groups that were functionally identical with regard to background characteristics; no statistically significant differences manifested between the groups in regards to age, sex, race, supervision and risk classifications, as well as the length of supervision term and the time elapsed between supervision's start and the beginning of the experiment.

Meeting Outcomes

About 14,000 appointments were assigned to the individuals enrolled in this sample during the evaluation window: 3,590 to the control group members (n=865), 3,477 to the *early text* group (n=857), 3,614 to the *late text* group (n=868), and 3,454 to the *two texts* group (n=880)[1]. On average, each person in the sample was assigned to participate in about 4 (SD=2.83) appointments during the evaluation period (min=2, max=33). Notably, the four groups of interest did not differ significantly between average total appointments assigned. Overall, sample members had an average of 3.44 (SD=2.63) appointments that were successfully held during the course of the evaluation, with the average number of held appointments not significantly differing between the group members. However, the average number of both canceled and no-show appointments did significantly differ between the groups (F=4.41, p=.004 and F=11.60, p=.000, respectively). These

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[1] Sample attrition is likely due to clients leaving supervision, experiencing reincarceration, moving to another state, or being changed to an annual or unsupervised reporting structure that would, in turn, impact the scheduling of the appointments during the experiment. Attrition rates did not significantly differ between the groups (not shown).

effects were driven by significant mean differences between the control group and the *late text* group (mean different=0.14, p=.006) for canceled appointments and significant mean differences between the groups receiving an *early text* and *two texts* (mean difference=-0.10, p=.003) as well as the control group and *late text* (mean difference=0.11, p=.000) and *two texts* (mean difference=0.13, p=.000) for no show appointments.

The rates of appointments held (F=9.28, p=.000), canceled (F=5.63, p=.000), and those where clients did not show up (F=5.37, p=.001) significantly differed between the groups of interest. The effects for the rate of held appointments were driven by statistically significant mean rate differences between the control group and *late text* (mean rate difference=-6.41, p=.000) as well as the control group and *two texts* (mean rate difference=-4.87, p=.000). The effects for the rate of canceled appointments were driven by significant differences between the control group and *late text* (mean rate difference=4.27, p=.000). The effects for the rate of no-show appointments were driven by the mean rate difference between the control group and *two texts* (mean rate difference=3.12, p=.002).

Appointment behaviors were followed for six months after the culmination of the treatment period. During this time, all participants received text messages one day prior to their appointment. In total 15,933 appointments were assigned to the sample members during this time – with 3,203 unique persons under supervision receiving orders to attend appointments. These appointments were spread across 803 former control group members (4,057 appointments), 802 former *early text* group members (4,033 appointments), 801 former *late text* group members (4,075 appointments), and 796 former *two text* group members (3,763 appointments). After the treatment period ended, the groups did not significantly differ from one another in regard to the total appointments held, canceled, or where clients did not show up. Likewise, the rates of appointments held, canceled, and "no-showed" did not differ between the groups after the evaluation was over.

DISCUSSION AND CONCLUSION

Overall the results of this evaluation suggest that the ACC texting protocol had an impact on the behavior of individuals under supervision but that this effect varied depending on when the reminders were sent, and was limited to the evaluation period.

A consideration of the evaluation design indicates that the random assignment protocol successfully minimized the differences in background factors between the groups, providing an appropriate empirical foundation for the analyses. During the course of the evaluation, several significant differences emerged between the groups, particularly between the control "no text messages" group and groups 2 (a *late* text *one day* before the appointment) and 3 (*two* texts sent *one day* and *four days* before the appointment). Control group members, on average, had significantly more canceled and no-show appointments when compared to the *late text* group, and more "no show" appointments when compared to the *two texts* group. The rate at which control group members held appointments was significantly lower than the *late text* and *two texts* groups, the rate at which control group members canceled appointments was significantly higher than the *late text* group, and control group members had significantly higher rates of no show appointments

when compared to the *two* texts group. Finally, no specific between group-level effects were ascertained between the control group members and the *early text* group members that received a text *two days* before the appointment.

Considering that the intervention is relatively low cost, it may be prudent to send text reminders (or continue to send text reminders) to everyone under community supervision about their appointments as a matter of agency policy. Upon consuming the results of this study, the timing of these messages is important. Texting someone about their appointment two days prior to the appointment date, as was the case with those assigned to treatment group 1, appears to be too much lead time for the participant to impact their appointment behaviors. However, one day of lead time (treatment group 2) and/or four days of lead time paired with another reminder the day prior (treatment group 3) does positively impact appointment behaviors across the dependent variables included in this study when compared to not texting participants reminders about their appointments. Additionally, this work should also build on the foundations of this study and explore which combinations of timing, substance, and individual characteristics (*e.g.*, risk profile, offense history, treatment needs) may encourage behavioral change.

Future research should attempt to take a broader and more detailed look at the impact of altering appointment behaviors of community supervision groups. While using text messages with a one day lead time for the participant presents as a low cost, simple, and effective way to increase the rate of held appointments and decrease canceled and no show appointments; it is not clear how appointments could positively or negatively impact clients' supervision experiences. For example, the impact of a reminder on revocations could be explored. While keeping probation and/or parole appointments may have no direct effects upon important outcomes such as employment or recidivism, they may increase rapport and connectedness between clients and supervising officers that could increase rehabilitative opportunities (e.g., program referrals, one-on-one counseling sessions, or communication about employment opportunities). Mandating regular contact, on the other hand, may increase the rates of recidivism connected to participants running afoul of the rules and regulations of supervision due to being more closely monitored during appointments. The true impacts may, in fact, be driven by a combination of these outcomes. As such, future research needs to connect appointment-centric data to pertinent outcome data such as changes in risk levels, officer behaviors in regard to technical violations and program referrals, and employment outcomes for participants.

REFERENCES

Farrington, D. P., Lösel, F., Braga, A. A., Mazerolle, L., Raine, A., Sherman, L. W., & Weisburd, D. (2019). Experimental criminology: looking back and forward on the 20th anniversary of the Academy of Experimental Criminology. *Journal of Experimental Criminology*, 1-25.

Hyatt, J.M. & Barnes, G.C. (2017). An experimental evaluation of the impact of intensive supervision on the recidivism of high-risk probationers. *Crime & Delinquency, 63*(1), 3-38.

Maruschak, L. M., & Minton, T.D. (2020). Probation and parole in the United States, 20172018. *Washington, DC: Bureau of Justice Statistics (BJS), US Department of Justice, and Office of Justice Programs*.

Lindner, C. (1992). The probation field visit and office report in New York State: Yesterday, today, and tomorrow. *Criminal Justice Review*, *17*(1), 44-60.

Medina, J. C. (2017). Making the decision to extend probation supervision at a local agency. *Crime & Delinquency*, *63*(13), 1712-1730.

Petersilia, J. (1997). Probation in the United States. *Crime and justice*, *22*, 149-200.

TABLE 1. DESCRIPTIVE STATISTICS AND BIVARIATE ANALYSES OF BACKGROUND CHARACTERISTICS AND APPOINTMENT BEHAVIORS

	Differences between groups: Background characteristics					
	Total sample	**Control Group**	**Experimental Group 1** *"Early Text"*	**Experimental Group 2** *"Late Text"*	**Experimental Group 3** *"Two Texts"*	**F or χ²**
Age	37.33 (11.09)	37.46 (11.11)	37.35 (11.13)	37.34 (11.11)	37.19 (11.01)	0.10
Male	73.35	73.10	73.50	73.40	73.40	0.05
Race						11.33
Black	31.15	31.00	31.10	31.30	31.20	
White	66.03	66.20	66.10	65.90	65.90	
Asian	2.35 0.13	1.90 0.20	2.50	2.40	2.60	
Native American	0.13	0.20	0.20	0	0.10	
Hawaiian / P.I.	0.23	0.50	0.10	0.20	0	
Other			0	0.20	0.20	
Supervision classification Parole Probation	41.77 58.23	41.80 58.20	41.50 58.50	41.90 58.10	41.90 58.10	0.04
Risk classification						2.63
Annual	1.05	1.00	1.10	1.20	0.90	
Maximum	6.25	6.90	6.40	6.00	5.70	
Medium	36.83	36.60	35.70	37.20	37.80	
Minimum	55.88	55.50	56.80	55.60	55.60	
Supervision term length (days)	2,242.27 (1,657.97)	2,211.82 (1,572.53)	2,280.82 (1,735.79)	2,217.18 (1,677.77)	2,259.27 (1,643.07)	0.40
Time on supervision at experiment's start (days)	720.46 (622.40)	744.10 (645.78)	715.52 (601.12)	696.75 (584.27)	725.45 (655.59)	1.01
N participants	4,000	1,000	1,000	1,000	1,000	--
	Differences between groups: Appointment behaviors during experiment					
	Total sample	**Control Group**	**Experimental Group 1**	**Experimental Group 2**	**Experimental Group 3**	**F or χ²**

	Total sample	Control Group	Experimental Group 1	Experimental Group 2	Experimental Group 3	F or χ^2
Total appointments assigned	4.07 (2.83)	4.15 (2.97)	4.06 (2.87)	4.16 (2.81)	3.93 (2.65)	1.33

	Total sample	Control Group	Experimental Group 1	Experimental Group 2	Experimental Group 3	F or χ^2
Appointments						
Held	3.44 (2.63)	3.38 (2.73)	3.37 (2.62)	3.64 (2.68)	3.37 (2.49)	2.25
Canceled	0.43 (0.83)	0.50 (0.84)	0.45 (0.85)	0.37 (0.77)	0.42 (0.85)	4.41**
No Show	0.20 (0.54)	0.27 (0.63)	0.23 (0.59)	0.16 (0.44)	0.13 (0.45)	11.60***
Rates of appointments						
Held	23.26 (26.68)	79.64 (28.34)	82.79 (25.87)	86.06 (25.30)	84.52 (26.70)	9.28***
Canceled	11.09 (21.79)	13.08 (23.39)	11.15 (21.30)	8.81 (19.39)	11.32 (22.66)	5.63***
No Show	5.64 (16.98)	7.27 (18.53)	6.06 (16.97)	5.13 (17.07)	4.15 (15.08)	5.37***
N participants	3,470	865	857	868	880	--
N appointments	14,135	3,590	3,477	3,614	3,454	--
	Differences between groups: Appointment behaviors six-months post experiment					
	Total sample	**Control Group**	**Experimental Group 1**	**Experimental Group 2**	**Experimental Group 3**	**F or χ^2**
Total appointments assigned	4.97 (5.07)	5.05 (5.30)	5.03 (4.77)	5.09 (5.51)	4.73 (4.66)	0.64
Appointments						
Held	4.33 (4.61)	4.38 (4.94)	4.39 (4.33)	4.39 (4.88)	4.15 (4.24)	0.39
Canceled	0.49 (1.05)	0.54 (1.06)	0.46 (1.09)	0.54 (1.11)	0.44 (0.96)	1.46
No Show	0.15 (0.48)	0.14 (0.44)	0.18 (0.53)	0.16 (0.52)	0.14 (0.45)	0.96
Rates of appointments						
Held	85.84 (24.28)	84.56 (25.33)	85.84 (24.76)	86.04 (23.86)	86.94 (23.09)	1.06
Canceled	9.92 (19.52)	11.28 (21.36)	9.34 (19.03)	10.35 (20.11)	8.72 (17.28)	2.06
No Show	4.24 (15.15)	4.17 (15.45)	4.82 (16.18)	3.62 (13.06)	4.35 (15.73)	0.67
N participants	3,203	803	802	801	796	--
N appointments	15,933	4,057	4,033	4,075	3,763	--

Notes: *=p≤.05; **=p.01; ***=p≤.001

Standard deviations of means are presented in parentheses.

Means of categorical variables are expressed as percentages.

The experiment ran for 196 days (or 28 weeks) from Monday, October 1, 2018 to Monday, April 15, 2019. Control group: no texts

Experimental group 1: a text *two days* before the appointment ("*early text*")

Experimental group 2: a text *one day* before the appointment ("*late text*")

Experimental group 3: texts *one day* and *four days* before the appointment ("*two texts*")

Age and risk classification represent measures at the start of the experiment P.I.=Pacific Islander