



The relationship between electronic goal reminders and subsequent drug use and treatment initiation in a criminal justice setting



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HIGHLIGHTS

- Common goals related to probation and treatment tasks and improving relationships.
- Nearly half of probationers volunteered to receive electronic goal reminders.
- The number of goal selected significantly increased between Visits 1 and 2.
- Those who opted for reminders had fewer days of substance use at follow-up.
- Those who opted for reminders had more days of treatment attendance at follow-up.

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ABSTRACT

Introduction: Opportunities to influence behavior through the use of electronic reminders has not been examined in a criminal justice population. The purpose of this study was to assess probationer preferences for short-term goals from a web-based program and evaluate the role of voluntary electronic reminders (e.g., text messaging, email) in achieving early treatment and probation tasks.

Methods: We used data from drug-involved offenders ($n = 76$) participating in a clinical trial of a 2-session motivational computer program. As part of the program, participants could choose to receive text or email reminders about their probation and treatment goals for the next month. Poisson regression models were utilized to evaluate goal and reminder selection in relation to the days of substance use and treatment attendance at two-month follow-up.

Results: The most common goals were related to probation and treatment tasks, relationships, and cognitive reappraisals. Forty-five percent of probationers elected to receive electronic goal reminders at Session 1 with a slight increase at Session two (49%). Probationers who opted to receive electronic goal reminders at Session one selected significantly more goals on average ($M = 4.4$, $SD = 2.1$) than probationers who did not want reminders ($M = 3.4$, $SD = 1.8$), ($t = 2.41$, $p = .019$). Reminder selection and total number of goals selected predicted days of substance use and treatment attendance at a two-month follow-up. Probationers who opted not to receive electronic reminders and those who only chose to receive reminders at one visit had more days of substance use compared to those who chose to receive reminders at both visits, 1.66 and 2.31 times respectively. Probationers who chose not to receive electronic reminders attended 56% fewer days of treatment compared to those who chose to receive reminders at both visits.

Conclusions: People's choice of short-term goals and reminders can provide advance notification of the likelihood of substance use and treatment initiation. Probation systems might use such information to triage at-risk probationers to a higher level of service, before problems have emerged.

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1. Introduction

Over four million people were under community supervision in the United States in 2012 (Glaze & Herberman, 2013). Nearly two thirds of these people were estimated to be substance-involved (i.e., a history of illicit drug use that is sufficient enough to warrant involvement in treatment) (Taxman, Perdoni, & Caudy, 2013). Many of the people

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involved in the justice system do not receive appropriate treatment, and consequently cycle through the system due to continued substance use and drug-related crime (Taxman, Perdoni, & Harrison, 2007b). Garnick et al. (2014) found that offenders who were engaged in substance abuse treatment were less likely to be arrested compared to those who were unengaged. There is preliminary evidence that technology-based interventions may be a cost-effective way to affect behavior change in resource poor settings such as criminal justice (Chaple et al., 2014; Taxman, Walters, Sloas, Lerch, & Rodriguez, in press).

One potentially cost-effective way to improve treatment engagement is to use technology-based (e.g., web, mobile) interventions to supplement traditional face-to-face interactions with a caseworker or probation/parole officer. Technology-based interventions have been shown to be effective in promoting treatment adherence in a range of healthcare and community settings (Buhi et al., 2012; Cole-Lewis & Kershaw, 2010; Davies, Morriss, & Glazebrook, 2014; Free, Phillips, Galli, et al., 2013; Head, Noar, Iannarino, & Grant Harrington, 2013; Merriell, Andrews, & Salisbury, 2014; Spohr et al., in press; Whittaker et al., 2009).

Technology is expanding exponentially each year, creating new opportunities to influence behavior. In healthcare research, technology-based reminders have been implemented to help people keep appointments and follow recommended immunizations (Free, Phillips, Watson, et al., 2013; Head et al., 2013; Odone et al., 2014). Mobile phone reminders have also been utilized to prompt physical activity changes with some success (Fry & Neff, 2009). For instance, in a sample of chronic obstructive pulmonary disease patients, mobile phone cues for improving physical activity increased activity levels 13% on average compared to an adjusted baseline level (Tabak, op den Akker, & Hermens, 2014). Prestwich, Perugini, and Hurling (2010) found a text messaging program increased physical activity and exercise planning compared to a control condition. In addition, when supplementary goal reminders were used, participants had increased weight loss. Cue-to-action interventions have been found to be effective in many areas of health behavior change but have not been previously tested with behaviors that might affect criminal justice outcomes.

Many behavior change theories assume that a cue-to-action is necessary to prompt behavior change (e.g., Health Behavior Model [HBM], Transtheoretical Model [TTM], and Social Cognitive Theory [SCT]). For example, the HBM states that perceptions of severity and susceptibility can change attitude but are insufficient to change behavior unless prompted by an external trigger (Rosenstock, 1974). Likewise, the TTM states that cues-to-action can help move people from contemplation to action to maintenance, and to avoid relapse (Prochaska, DiClemente, & Norcross, 1992). Indeed, triggers on their own are widely used to promote everyday behaviors such as stopping at a red light, keeping doctor appointments, and waking up in the morning. Similarly, social systems can make use of triggers to promote more complex behaviors. For example, people in the criminal justice system are expected to manage a variety of tasks (e.g., appointments, classes, avoiding high-risk people or situations, refraining from substance use, obtaining/maintaining employment), but the criminal justice system has not adopted systematic ways of reminding supervisees to complete these tasks.

Technology-based interventions are uniquely suited to provide behavioral triggers because of the nature of 'always on' devices (e.g., mobile phones), ease of use (e.g., setting alerts), ability to provide tailored information and feedback, and geospatial locating capabilities (Fogg, 2003). Web-based and text message interventions have been found to be more effective when messages are personalized and tailored to the specific person (Head et al., 2013; Webb, Joseph, Yardley, & Michie, 2010). Additionally, the importance of intervening in the moment is also recognized. Mobile phones in particular have become increasingly time and context aware (e.g., social networking, buying patterns, geospatial location), which has been demonstrated to assist people who are seeking to avoid substance use (Gustafson et al., 2014).

This technological "awareness" will increasingly move behavioral triggers into the forefront of decision-making and behavior initiation.

Relatively few models have examined the integration of behavior change and technology. One model, the Fogg Behavior Model (FBM; Fogg, 2009) describes mechanisms of change in persuasive technology design. The FBM assumes that in order for a behavior to occur, a person must have the motivation and ability to engage in the behavior, followed by an effective cue-to-action. Similar to the HBM, the FBM suggests that motivation and ability affect cognitions, while triggers affect the occurrence of the behavior. While many face-to-face interventions target motivation and ability to engage in a behavior, the FBM suggests that technology may be particularly well suited to providing triggers or reminders in a person's environment. Another model, behavioral intervention technology (BIT; Mohr, Schueller, Montague, Burns, & Rashidi, 2014) forms the development of technology intervention elements, characteristics, and workflow integrated with behavioral theory to provide the pathways between behaviors and treatment goals. The BIT model stresses the ability to break down larger treatment goals into manageable intervention aims that address the what, when, why, and how of the intervention. Models such as these can be used to merge behavior change theories with technology implementation principles to effectively address substance use disorders.

One program that integrates behavioral theory with technology is the Motivational Assessment Program to Initiate Treatment (MAPIT). MAPIT is a two session web-based intervention for probationers targeting individual substance use and treatment initiation, which may reduce the burden on the probation officer to address these behaviors. In addition, MAPIT uses theory-based algorithms and a synthetic speech engine to deliver custom reflections, feedback, and suggestions. The program is intended to be completed near the start of probation, during a time in which clients are making critical decisions about early court-mandated tasks (Walters et al., 2013).¹ Probationer behaviors that are consistent with a successful probation outcome may include: attending classes and/or appointments, abstaining from substance use, avoiding high-risk environments, finding and maintaining employment, and managing anger and/or stress. MAPIT incorporates materials to: increase motivation (e.g., risk estimates), assist with planning (e.g., suggestions, referrals, scheduling), and remind clients about their goals (e.g., email or text reminders). MAPIT consists of two 45-minute sessions. Session one targets increasing motivation to complete probation, initiating treatment, and reducing substance use. Session two aims to help probationers develop concrete strategies to accomplish tasks such as goal-setting, managing high-risk situations, and identifying social supports. Both sessions allow participants to select goals for the following month, and to receive text or email reminders about those goals.

MAPIT is an example of a technology-based intervention that focuses attention on the probation and treatment related tasks needed to be successful in the probation system. The purpose of this study was to examine probationer engagement in a web-based motivational intervention to reduce substance use and initiate treatment, specifically related to goals and electronic reminders. This study had three aims: 1) Identify the most prevalent early probation and treatment goals; 2) evaluate voluntary goal and electronic reminder selection; and 3) assess the role of goal reminders for early substance abstinence and treatment attendance. We hypothesized that participants who elected to receive reminders would be more successful at completing their selected goals, consequently reducing substance use and increasing treatment attendance at a two-month follow-up.

¹ Samples of the program can be viewed at:
<http://youtu.be/9yV6bTn1tVE>.
<http://youtu.be/XEZ5o48WwTg>.
<http://youtu.be/u2SHWGOQXe8>.
<http://youtu.be/wMShVdPpcsw>.

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