Remaking the Electronic Tracking of Offenders into a “Persuasive Technology”

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ABSTRACT

Mobile surveillance of offenders was first demonstrated more than 50 years ago, although not with the taken-for-granted punitive emphasis that it has acquired today. Contemporary use of Global Positioning System (GPS) tracking indicates that it can reduce certain types of offenses while the person is being monitored; however sustained beneficial effects remain in doubt. Given the long history of numerous crime-fighting proposals, and the persistent orientation towards punishment, the probability that electronic tracking in its present forms will eventually prove to be a worthwhile advance is not great. This article explores the history of offender tracking technologies, including GPS tracking. The article also seeks to resurrect some of the original, nonpenal, hopes for mobility monitoring (using an array of digital systems and devices) with the intention of remaking electronic monitoring into a “persuasive technology.”

KEYWORDS

Persuasive technology; tracking

Introduction

The inspiration for the original monitoring program with young adult offenders came from the film West Side Story. Ralph Kirkland Schwitzgebel (family name later shortened to “Gable”), then a graduate student at Harvard, imagined a communication system that would have prevented the male protagonist of the film from being killed. Purposeful misinformation given to gang members in the film that resulted in a revenge killing could be prevented, he reasoned, if more direct information could be sent while gang members were on the move. A week after seeing the movie for the third time, he met an electrical engineer, William Sprech Hurd, at a cocktail party. Within the next year they purchased surplus missile tracking equipment (see Figure 1), and also designed several portable transceivers and stationary radio-frequency relay stations. The transceiver and its battery pack measured approximately 15 × 8 × 3 cm (6 × 3 × 1 in) with a total weight of about 1 kg (2.2 lb). The relay stations were placed on buildings around Cambridge.
Massachusetts. The main base-station antenna was mounted on the roof of the Old Cambridge Baptist Church.

The equipment was cumbersome, and the volunteer research participants either adjusted to the monitoring system within the first few days, or they rejected it (see Figure 2). The tracking was done in real time over a 5 square block area. The purpose was to extend, geographically and in real time, rehabilitative counseling that typically occurred for only an hour in an office setting. The extent of tracking varied from a couple of hours to an entire day, depending, in part, on the needs of individual participants.

A review of results from the first 16 participants showed a modest reduction, but not elimination, of criminal activity compared to a control group (Schwitzgebel, 1969a). Because participation was voluntary, the higher risk parolees or probationers tended to remove the equipment for a “vacation” prior to participating in questionable activities. Thus, the project could be best described as a proof-of-concept demonstration rather than a test of the efficacy of the technology as a crime reduction tool (Schwitzgebel, 1969b; Schwitzgebel, Schwitzgebel, Pahnke, & Hurd, 1964; Ward, 1970).

Kirkland Gable’s twin brother and collaborator, Robert, subsequently moved from Cambridge to Los Angeles where he constructed a low-powered FCC-licensed radio station (Federal Communications Commission, 1967) and a two-way tactile belt as part of a mobile communication system with probationers (Schwitzgebel, 1969a, 1969b; see Figure 3). The system was designed to send short messages (similar to what would now be referred to as “tweets”) while the recipient was in a classroom or at a job site. The recipient could reply with a few short taps using prearranged signals (similar to simplified Morse code). Due to technical limitations, the messages were typically garbled or incomplete; however, that limitation seemed generally irrelevant. The fact that some form of positive attention was being given was sufficient to encourage the probationer to continue his planned activity.
Later research involved telemetering physiological characteristics such as heart rate and galvanic skin response of offenders in natural social settings (Schwitzgebel & Bird, 1970). Physiological measures were used to verify the self-reported emotions of probationers when encountering anxiety-producing individuals or situations. The primary goal was to reduce impulsively hostile reactions by means of training relaxation responses during the encounter.

Media reports of such experiments (e.g., New York Times, 1969) typically brought negative reactions, most often charges of being Orwellian. These reactions seemed unjustified to the experimenters. The tracking systems were designed and used in a manner that was open, honest, and positively oriented. One of the experimenters (Schwitzgebel, 1970, p. 34) wrote the following:

We are what we invent. A human can be distinguished, in part, from other animals because, having invented chairs, he is a chair-sitting creature. He is a flying creature because he invented airplanes. We are dangerously aggressive animals when we give ourselves tools which kill; or we are gregarious animals when we give ourselves
apparatus (such as musical instruments) which augment other latent behaviors. The most serious social threat of technology is not over-control in the style of Brave New World or 1984 but rather anarchy, chaos, or massive disorganization. ... Guerrilla actions against public water supplies, communication networks, or transportation systems could temporarily paralyze, if not seriously injure "Big Brother." ... We now have the technical knowledge and hardware to begin systematically to implement widely-acknowledged social goals without relying on traditional procedures of punishment and deterrence [italics in original].

The attempt to monitor offenders became moribund for approximately a decade until resuscitated by a compassionate Arizona state district judge, Jack L. Love (see Figure 4).

In 1977, Judge Love’s fertile mind was looking for a technological solution to the problem of an over-crowded correctional system and of prisoners attempting to escape from prison.¹ He noticed an article in the local newspaper describing a device implanted under the skin of livestock that would transmit information about an animal’s temperature. He also recalled seeing a series of Spiderman cartoons in the Albuquerque Journal newspaper in which a villain attaches an oversized I.D. bracelet to Spiderman that allows the villain to locate, by radar, Spiderman’s location at any time.

Several years later, in 1982, Judge Love was convinced that some combination of transmitter bracelet and a nearby card-reading device could be used to verify that a probationer was at a designated location. As a practical matter, Judge Love imagined some form of I.D. tag, such as those used in hospitals, which would activate a card reader when in proximity. He was not aware of the Harvard project, and given the reluctance of fellow judges (Cassidy, 1983), monitoring probationers at a fixed location was politically and technologically the most prudent course of action.

His attempts to sell the idea to several computer companies were unsuccessful, but a sales representative at Honeywell Information Systems, Michael T. Goss, liked the idea. Goss, a former Navy officer and policeman, had
already decided to leave Honeywell. Goss used his sales experience and entrepreneurial talent to raise $10,000 of investor money in order to establish the National Incarceration Monitor and Control Services (NIMCOS) company. Judge Love refrained from investing in NIMCOS. NIMCOS manufactured an ankle transmitter about the size of a pack of cigarettes capable of sending a radio signal approximately 100 meters (109 yards). A stationary receiving unit in the offender's residence was linked by telephone line to a Kaypro desktop computer (see Figure 5). Failure to get a signal from the probationer indicated the possibility that the probationer had left home.

In March 1983, Judge Love held a news conference showing the transmitter attached to his ankle (Cassidy, 1983). A month later he received reluctant permission from the state's highest court to use the device. The judge had a good rationale for sentencing the first three individuals (a diabetic convicted of drunk driving, a former heroin addict who had passed bad checks, and a student in computer science convicted of petty burglary). He reasoned that all three should avoid the violent atmosphere of prison; instead, they should have some opportunity to go shopping, look for work, or attend school. Two of the three probationers completed their 30-day sentence; the computer science student, however, was jailed for drunkenness.

The Albuquerque experiment was short-lived. By July 1983, Mr. Goss' fledgling company had run out of money, and his GOSSlink system was shut down when he could not afford to upgrade his equipment or to rent time on the county's computer. Apparently, venture capitalists did not want to invest more in such a high-risk endeavor. However, one reluctant venture capitalist referred Goss to a company called "Boulder Industries" in Boulder, Colorado.

The timing could not have been better. Boulder Industries (BI) manufactured and sold an "Electronic Dairy ID System" which allowed individual
cows at large dairy farms to be identified in a manner that allowed each of them to have a unique diet at the feeder. Sales of the system were slumping. According to the company’s then-president, David Hunter, BI had milked dry the dairy marketplace, and had been unsuccessful in getting pharmaceutical companies to use electronic ID tags for drug packages.²

Fortunately, Hunter who had been a Peace Corp volunteer and real estate investor was a risk taker. About three months later, he loaned NIMCOS $250,000 for the purpose of manufacturing the devices. Initially, Control Data Corporation, a large computer and financial services firm in Minneapolis, Minnesota, marketed NIMCOS equipment, but they went bankrupt within 2 years for reasons other than poor sales of monitoring equipment. BI bought NIMCOS and continued on its own. Today, BI is a wholly-owned subsidiary of a corrections facility management company (the GEO Group, originally Wackenhut Corrections Corporation). BI is the largest monitoring service provider in the United States, tracking over 60,000 offenders.

While Mr. Goss was looking for funding, a young inventor in Florida, Thomas Moody, became aware of Judge Love’s work. Moody and his father owned a burglar alarm company and a radio station—an ideal combination of businesses for the nascent technology of offender monitoring. An opportunity presented itself when Moody persuaded Judge Allison DeFoor of Monroe County, Florida, to allow a probationer guilty of a serious driving offense to try Moody’s newly designed monitoring equipment as part of an “In-House Arrest Program.”

Moody’s invention consisted of a radio transmitter housed in a 16×6 cm (5×2.5 in), 85 gram (3 ounce) grey plastic case shaped as a half-cylinder (see Figure 6). It could be worn on the wrist or ankle. This transmitter sent regular signals to a suitcase-size home monitoring unit which was linked by phone to a computer at the monitoring center (Controlled Activities Corp, 1984).
In April 1984, Judge DeFoour transferred oversight of the In-house Arrest Program to Edward Al Garrison, Administrative Judge of the Palm Beach County Court, who then placed 12 probationers on what was now coming to be called “electronic monitoring.” The probationers were supervised by a large $2,000,000 per year nonprofit probation service agency, Pride, Inc. Moody’s newly-minted Controlled Activities Corporation provided the equipment. Pride’s program director, Glen Rothbart, formed a separate company, Corrections Services, Inc. (CSI), for the purpose of writing software applicable to the In House Arrest Program (Henderson, 1988). Moody’s company was bought by BI in December 1988. Rothbart’s company wound down operations in 2010, after settling a law suit with an equipment supplier (Marconi Circuit Technology Corporation) whose battery packs in their units could “go into ‘burn up’ mode at will. ...” (Corrections Services, Inc., 1992, p. 1).

The GOSSLink and In-House Arrest Program were monitoring systems, but differed significantly from the original Harvard demonstration in two respects: (a) The original demonstration used a mobile technology that did not involve house arrest, and (b) the original demonstration used rewards rather than sanctions as a rehabilitation strategy. Among early commercial developers, there seemed to be little interest in tracking offenders. Most correctional agencies, policy makers, and the general public seemed quite satisfied if an offender’s home could be made as secure as a prison cell. Inconveniently, however, people under house arrest need to leave their homes, if only for medical appointments and (hopefully) for work to pay for rent, food, and monitoring fees. Global Positioning System (GPS) surveillance is a logical extension of house arrest, but simply expanding the geographic range of sanction-oriented surveillance is a faulty strategy from the perspective of long-term public safety. Offenders need to be positively supported in a process of often-faltering rehabilitation/socialization.
The original Harvard demonstration was guided by a basic (though counter-intuitive) rule of behavior therapy: *Don't look at the client's behavior but at the environment of which the behavior is a function.* The use of location-tracking technology allowed the experimenters to give symbolic and tangible rewards in order to reduce aggression in previously hostile environments such as school or interethic encounters. The use of punitive sanctions was not an option in the Harvard program because without the continuing goodwill of the probationers, the wearable mobile equipment would be "lost" or destroyed.

**Developing mobile supervision technology**

Probably the monitoring configuration closest to the original demonstration, in terms of communication architecture, was that of the Westinghouse Electric Corporation, which in 1994 designed, and later tested, a "community-wide radio surveillance system" (Murphy, 1995, 1997). Strategically placed minibase-stations were placed in downtown Pittsburg, Pennsylvania, on rooftops, utility poles, and other convenient structures. These base stations received radio frequency (RF) signals from anklet transmitters. Information regarding the client's identification and arrival time at a particular location was then transmitted by a RF channel to a surveillance center. This use of multiple remote RF terminals, with timing capability as a means of monitoring the location of individuals, had been patented at least a decade earlier for use with underground miners (Miller, 1985).

Although the U.S. military's satellite-assisted navigation system, known as "NAVSTAR/GPS, was made available for civilian use in 1983, it was not appropriate for monitoring offenders because, reportedly, the military purposely introduced measurement errors into the civilian version (Lever, 2004). This intentional error resulted in misreading a target by as much as 100 meters. The Westinghouse development team noted (accurately) the limitations of GPS, including this measurement error as well as the loss of signal when inside certain buildings, and the requirement of a fairly large transmitter battery (Murphy, 1995). Hence, the team decided to use the more practical RF system based on the simplicity, reliability, and lower cost of system components.

Congress forced a correction of the military's intentional GPS error in 1996 (National Defense Authorization Act of 1996, 1996). Accurate civilian access to GPS prompted a couple of companies to develop a more elegant system of mobile surveillance of offenders. One of these companies was Sandia National Laboratories which in 1996 proposed a 5-year plan to implement continuous monitoring of offenders over a wide geographic area (Hoshen & Drake, 1998). AT&T/Lucent Technologies, also funded by the National Institute of Justice, was assigned the task of forming a consortium to build six prototype systems.
The system architecture used a belt-wearable GPS unit and various stationary GPS servers placed at strategic locations with an unobstructed view of the sky. These servers had a GPS satellite receiver and a RF channel linked to the mobile GPS unit. This innovative “server assisted” system was designed to overcome some of the major limitations of conventional GPS mobile devices.

Meanwhile, things were stirring in Florida (in a scenario somewhat similar to Goss’ efforts a decade before). An Air Force veteran and graduate of Rochester (New York) Institute of Technology, Hoyt Lawson, was employed at Honeywell as a senior staff engineer working with satellite communications. His entrepreneurial enthusiasm led him to leave Honeywell and co-found Pro Tech Monitoring with the former governor of Florida, Bob Martinez, who had served until 1993 as Director of the U.S. Office of National Drug Control Policy (the “Drug Czar”). In 1996, Mr. Layton filed for, and later received, a patent for a portable GPS device to be used with criminal offenders (Layton, 1998). The system used an ankle bracelet that sent a RF signal to a 1.5 Kg (3.3 pound) “portable” relay device containing a computer, pager, and transceiver that communicated with Pro Tech’s monitoring facility. The state legislature of Florida gave $100,000 to Pro Tech in 1997, and by the end of the year, a pilot project was implemented (Florida State Senate Committee on Criminal Justice, 1999). The first four monitored offenders were nonviolent parolees convicted of possession of cocaine, attempted arson, lascivious acts, and forgery (Gussow, 1997). In the first year of operation, the company tracked 150 offenders in seven states (Brauer, 1998). Pro Tech was purchased in 2007 for $12.5 million cash by the Israeli company, Dmatek/ElmoTech (itself later purchased by the “3M” corporation).

A third company, Advanced Business Sciences of Omaha, Nebraska, marketed a “ComTak” system in 1997 as “A new generation of thought... A rehabilitation alternative... [and]... A safer world” (Advanced Business Sciences, 1997). One of the founders was John J. Gaukel who filed for a patent in April 1997 using GPS for continuous electronic monitoring individuals as they walked around in hazardous environments (Gaukel, 1997). That year, the company reported a fourth quarter income of only $13,000 (Advanced Business Sciences, 1999), and although they were the only company bidding against Pro Tech for the $100,000 pilot project in Florida, they dropped out of the process. In 2001, the company changed its name to iSECUREtrac. In 2013, iSECUREtrac was purchased by a privately held company, Corrisoft, whose founder and former CEO was Brian C. Poe, a well-known sports commentator in the United States and an advocate for ex-offenders.

This gradually expanding use of offender tracking occurred primarily in the context of get-tough-on-crime public sentiment and as a cost-effective escape hatch for prison overcrowding. Compared to incarceration, home confinement is substantially less expensive, particularly if the number of crimes that are presumably prevented are factored in (Roman, Liberman, Taxy, &
Downey, 2012). In terms of arrest rates only, reduced recidivism varies widely from 9% (Tella & Schargrodsky, 2013) to 31% (Padgett, Bales, & Blomberg, 2006), depending on many factors such as offender characteristics and research design. In a comprehensive study of GPS used with sex offenders, GPS was found to be significantly better in reducing recidivism for 1 year than traditional parole supervision (Gies et al., 2012). Furthermore, another study found GPS to be superior to RF house arrest for pretrial or convicted individuals accused of domestic violence (Erez, Ibarra, Bales, & Gur, 2012). It is reasonably safe to conclude that among medium- or high-risk offenders, recidivism is reduced while they are being monitored, and that recidivism might be at least be marginally reduced for 1 year after monitoring is discontinued. The degree to which recidivism is reduced for more than 1 year after monitoring is uncertain (Aos, Miller, & Drake, 2006; Bonta, Wallace-Capretta, & Rooney, 1999; Olotu, Beaupre, & Verbrugge, 2010; Pearson, 2012). One study, notable for a 4-year follow up after monitoring, found that when monitoring was combined with occupational supervision and personal therapy, return-to-prison was reduced by almost 30% (Shoham, Yehosha-Stern, & Efodi, 2014). As a general rule, without treatment, younger offenders tend to drift back to criminal activity as more time passes (Deuchar, 2012; MacKenzie & De Li, 2002).

GPS surveillance can be viewed historically as just one more attempt to deal with violations of social norms by physical means (e.g., prisons, moats, razor wire, locks, cash registers, computer passwords, credit card security codes). These so-called “technofixes,” as critics like to call them, often create new problems while attempting to solve the original one. The thief frustrated by a car alarm, steals just the catalytic converter; the thief who wants cash in a cashless society, turns to credit card fraud. Any offender monitoring system too focused on violations, gets overwhelmed with data. The sex offender monitoring program previously cited (Gies et al., 2012, pp. 4–16), reported that the average number of GPS events per year per parolee was 117. A survey by the Associated Press in 2013 found that the Delaware State Department of Correction, which had 31 field officers, handled 514 alarms per day (Caruso & Riccardi, 2013). The state of Maine in 2013 discontinued monitoring, citing officer labor costs (Higgins, 2013).

Unfortunately, most alerts are not a valid indication of a crime in progress. After a homicide in Orange County, Florida, a judge suspended a GPS pretrial monitoring program until a program overhaul could be made (Damron, 2013). In Colorado, a parolee slipped out of his ankle bracelet for 5 days before a warrant was issued—the same day that he shot and killed the executive director of the state department of corrections (Riccardi, 2013). The new Colorado state director of corrections announced that officials were considering the use of cell phones instead of electronic bracelets (KKTV.com., 2013). Presumably, such phones would be GPS enabled and have voice recognition
software (e.g., Anytrax, 2016). Between 1989 and 2014 there have been at least 50 homicides in the United States committed by individuals while being monitored. As politically appealing as tracking might be, it appears that we cannot simply outsource prison guards. The basic problem with the implementation of surveillance technology thus far, whether stationary or mobile, is that it has been used primarily as a tool for legal intervention rather than as a means of informal socialization.

Sanctions or rewards? “Cookies for gang members”?

Decades of psychological research indicates that moderate-level sanctions can be effective for rehabilitation when combined with rewards (Kleiman, 2009). The problem with sanctions/punishment is, in part, that it cannot be applied without a backlash. Offenders tend to push limits and ignore threats. (That’s why they’re offenders.) If and when a punishment is actually administered, the offender often sees it as “unfair” because he or she has gotten away with unpunished criminal activity before, or at least knows people who have. Resentment then follows.

In order to partly satisfy the offender, sanctions must be accompanied by a larger dose of rewards. Rule #8 in basketball coach John Wooden’s widely publicized coaching and corporate leadership plan (Wooden & Jamison, 2009, p. 1) reads: “The carrot is mightier than the stick.” Rewards are best given in the ratio of four positive consequences for every sanction (Clark, 2001; Gendreau, Listwan, & Kuhns, 2011; Madsen & Madsen, 1974; Patterson, Reid, & Dishion, 1992). In addition, rewards should be given (a) unexpectedly but within a relatively short time period of a day or two, (b) with varying degrees of personal value to the offender, and (c) for gradual improvement in prosocial behavior.

The 4:1 socialization ratio does not fit comfortably into the current supervision style of monitoring programs. The general public and some corrections officers find the idea of “rewarding criminals” extremely repugnant. After a speech by one of the present authors (RSG), a federal corrections official spontaneously referred to the use of positive incentives as “cookies for gang members.” He expressed, in a humorous but cogent manner, a legitimate concern that must be addressed if tracking is ever to become an effective tool for long-term offender rehabilitation.

A model of how a reward/sanction program might be structured is illustrated by a study of adult felony-level offenders within the Wyoming State Department of Corrections (Wodahl, Garland, Culhane, & McCarty, 2011a, 2011b). The study randomly assigned retrospectively 283 parolees and probationers to intensive supervision which included GPS for some participants. The rewards ranged from verbal praise to extended visitation rights. The sanctions ranged from verbal reprimand to county jail time. Most notably, the
Researchers systematically varied the ratio of rewards and sanctions from “1 reward to 10 sanctions” to “10 rewards to 1 sanction.” The most cost-effective ratio was “4 rewards to 1 sanction” for reducing the number of violations. Careful and well-controlled prospective research is needed to verify this study’s tentative result.

It is worth noting that community corrections officers are themselves subjected to excessive punishment in their line of duty. The media becomes outraged when an offender who is being monitored commits a serious crime. Lawyers rush in; monitoring companies and correction officials look for someone else to blame. Monitoring programs need to be restructured and publically repackaged in a way that allows officers to use both moderate punishment and frequent rewards without facing law suits and public derision.

How the public feels, in general, about offenders is relatively trivial. What makes a significant difference is the degree to which the public cares about the correctional system as a whole. A careless or hostile system will release too many careless or hostile ex-offenders back into the community, and the community will suffer as a result. Long-range, collective feedback from communities is ultimately the best guide.

A new persuasive technology

In terms of rehabilitation, home confinement is something of a perversion of the original mobile monitoring demonstration of the 1960s. The punitive nature of home confinement (albeit less drastic than prison) does not allow for positive reinforcement of desired behavior in natural social situations. If supervision programs are developed within the traditional philosophy of containment, mobile devices could become little more than a pocket Panopticon (the all-seeing surveillance prison proposed by 18th Century philosopher, Jeremy Bentham). However, if done in the context of “persuasion” rather than “control,” GPS tracking offers expanded opportunities for informal socialization.

At present, the most likely candidate for technical innovation is some type of tethered smartphone phone with the usual package of a touchscreen computer, GPS, digital camera, Wi-Fi, and software applications. A rudimentary example of a GPS cell phone system has been designed to monitor juveniles who are under house arrest for felony sentences (Strezoff, Sulbaran, & Duckworth, 2009). In this design, the cell phone was paired with a Bluetooth bracelet. Another GPS precursor would be location-based games for entertainment and health promotion (Fogg, 2002; St. John, 2004). For example, cell phones have been used for the treatment of cocaine-addicted homeless patients (Freedman, Lester, McNamara, Milby, & Schumacher, 2006).

Some location-based games have been designed in a way that purposefully promotes prosocial behaviors within the players’ customary environments. Instead of thinking hostile thoughts about fellow players, the games require
that participants interact in a cooperative manner (McGonigal, 2006). As an illustration, a game might be designed so that half of a gift certificate is given to one player who then needs to find another player who has the other half of the certificate which allows both players to get a free pizza.

Or consider this possibility for using a reward: A monitored offender who is typically late to appointments happens, by chance, to arrive promptly at a vocational training class. A RF beacon has been placed in the classroom area. The beacon relays a message to the surveillance center that the offender’s ankle has come within a designated range. A tweet is then sent on the offender’s cell phone indicating that a certain number of minutes has been added to his or her prepaid phone card.

More creatively, a contrived social situation might be planned along the “digital pathway” that a GPS-monitored parolee routinely takes to a work-release program. Volunteers from a social service agency could arrange that a college student with a cast on one leg suddenly drops several books which she struggles unsuccessfully to pick up (This scenario was actually used by a social psychologist to measure the “friendliness” of different cities [Levine, 2003]). The book dropping will happen just as the parolee is approaching. He may or may not offer help. If he does, he would unexpectedly become eligible for a free haircut or some bus passes. If he does nothing, there is no punishment, but his probation officer might mention later at an office meeting or in an e-mail that an opportunity for a friendly deed was missed. Admittedly, within today’s EM protocols, such a scenario seems outlandish! Nonetheless, GPS monitoring allows some form of positive reinforcement to be presented in an offender’s natural social environment so that he or she will be more likely to look for unexpected opportunities to act in a helpful manner. Having a little fun should not be against monitoring rules.

A different technical configuration for positive monitoring might use a graphic information system, linked to a particular location. Small bluetooth-enabled transmitters could be placed at various locations that sequester information downloadable to offenders’ smart phones. The information might relate to a unique feature of that location such as computer training classes, previous events that occurred there, public sport opportunities, YMCA memberships, or low-cost dental service (Bonacini, 2012).

Other community-based configurations might involve radio frequency identification (RFID) tags the size of a key fob with a unique ID number for each offender. “Active” RFID tag transmitters which include an on-board battery can broadcast a signal up to 100 meters (300 feet); these can be as small as the size of a coin. Smaller “passive” tags that have no battery must be activated by an external signal; however, these can be miniaturized to the size of two grains of rice. They have a communication range of about 10 meters (3 feet). RFID readers could be placed at treatment centers, halfway houses, schools, work sites, or any location where an offender should...
be at a certain time. The reader would be connected to the Internet. In a game-oriented application, the RFID reader might automatically select a number in a Bingo game, and then pair it with the offender's ID (e.g., Collins, 2006).

Prison inmates have already been required to wear RFID tags as a means of preventing violence. A study funded by the U.S. National Institute of Justice reported 14 correctional institutions in the United States used secured RFID wristbands or anklets which alerted authorities when an inmate moved into an unauthorized area (Hickman, Davis, Wells, & Eisman, 2010). The system was used, in part, to separate gang members.

**Coming of the “mother button”?**

As previously mentioned, the original idea of electronic monitoring of offenders was not well received. When Ralph Kirkland Schwitzgebel sent a manuscript describing the Harvard project to the U.S. government publication, *Federal Probation*, the manuscript was returned with a letter from the editor, reading in part:

I get the impression from your article that we are going to make automatons out of our parolees and that the parole officer of the future will be an expert in telemetry, sitting at a computer, receiving calls day and night, and telling his parolees what to do in all situation and circumstances. ... Perhaps we should also be thinking about using electronic devices to rear children. Since they [children] do not have built-in consciences to tell them right from wrong, all they [parole officer] would have to do is to push the "mother button" and she would take over the responsibility for decision-making. (Evjen, 1966)

Understandably, a paper that describes the use of missile tracking equipment to modify the behavior of parolees or probationers is likely to get a negative response from anyone concerned about human freedom and spontaneity. Today, many social commentators continue to express concern that GPS and RFID technology will chip away at civil liberties (Rosenberg, 2008; Staples, 2014). Subdermal RFID tags are already becoming common for identifying animals such as lost pets. In 2004, the U.S. Food and Drug Administration approved the implanting of RFID tags in humans, and an amateur technologist in Bellingham, Washington State, implanted tags in the hands of himself and a woman friend that allows them to open locked doors with a wave of the hand (Graafstra, 2007). It is easy to imagine a dystopian scenario where external RFID tags morph into RFID tags implanted in parolees. The first candidates for implanted RFID tags would likely be sex offenders who most often (and unfairly) satisfy the public's zeal for punishment. Fortunately, several states (e.g., California, North Dakota, and Wisconsin) have enacted laws preventing involuntary microchip implantation (e.g., Wisconsin, 2006).

The concern about civil liberties is justified, at least in part, because there is little evidence that monitoring programs will significantly lessen their reliance
on incapacitation and punishment. Nonetheless, to the extent that corrections officials can be convinced to replace punishment with positive incentives, concerns such as privacy will automatically diminish. People hide from the police, not from Santa Claus.

Most social critics have not had professional training in the application of positive incentives as outlined by Skinner (1969) and others (Clark, 2001; Hansen, 2008; Wood, 2010). One “detail” that is usually overlooked is the necessity to pay close attention to the precise nature of positive consequences that are needed to be effective. Due to individual differences in biology and prior social conditioning, simply delivering a standardized reward is usually not as effective as a more idiosyncratic one. Even money, the most generalized positive reward, can become stale and unappreciated, assuming the recipient is not in a survival mode. For example, giving one’s spouse an unexpected gift of $20 will not have the same effect as giving him or her a favorite food, flowers, or candy of the same value. The more unique the positive consequence, the more effective it is likely to be, because it shows that the giver has recognized the unique individuality of the recipient. When it comes to effective rewards, one size does not fit all.

Any general plan of social control must create a spectrum of social environments which afford individuals a variety of ways to explore how they can become socially valued, self-respecting, healthy, and generally appreciative of life. Technology can help. Few of us would wish to live in precomputer days. It would be futile to predict the exact nature of mobile communication infrastructures of the future. The examples of technology in this article have been given only to stimulate discussion about how monitoring programs might become more convivial, so that offenders will be drawn into a rehabilitative process. For better or worse, the ambitions and dreams of all of us will be shaped by an increasingly densely-textured communication matrix of actual and virtual reality. Such ambitions and dreams should have more substance than, say, the short-lived hope generated by an Internet lottery ticket. But a lottery ticket now and then won’t hurt.

Notes

1. Jack Love, Michael Goss, David Hunter, Ricardo Rivera, and Glen Rothbart generously provided historical information to Robert Gable during in-person or telephone interviews in 2006. Any factual errors in this account are the responsibility of the interviewer.

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