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Ray Surette

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CCTV AND CITIZEN GUARDIANSHIP SUPPRESSION: A QUESTIONABLE PROPOSITION

RAY SURETTE

University of Central Florida

An untested hypothesis regarding closed-circuit television (CCTV) is that the use of CCTV surveillance systems causes the loss of informal citizen guardianship activities in camera-surveilled public spaces. This hypothesized effect is empirically tested in two ways. In the first approach, an examination of survey responses between respondents who were aware, without prompting, of a public space surveillance camera system (24.4% of the respondents) and those who were not aware of the cameras is undertaken. The expectation is that preexisting knowledge of the cameras will be associated with attitudes associated with a self-reported reduced willingness to exercise guardianship actions. In the second approach, time series data sets of calls for service in a CCTV-surveilled area and a comparison control zone are examined. Neither method revealed empirical evidence of a degrading of informal citizen guardianship activities following the installation of CCTV cameras.

Keywords: *CCTV; surveillance cameras; citizen guardianship; public surveillance*

Historically, formal surveillance of the public has been a manual task, the surveillance results stored in written paper-based records and files. As the German Gestapo and Soviet Secret Police demonstrated, manual surveillance and paper records could be extensive, but the surveillance was also clearly bounded by the number of available personnel and the need to maintain and manually search bulky written data files. Based on electronic visual technology, however, closed-circuit television (CCTV) extends the capability to surveil and has made possible the constant surveillance of public

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spaces.¹ These contemporary public space surveillance systems employ remote control CCTV cameras mounted on street lights or buildings in common use, public areas and provide local public safety agencies with a 24/7 electronic patrol capability. Recent successes in computer vision algorithms have increased the technological reach of these systems to the level where they now have the potential to automatically monitor public spaces without human involvement. Surveillance of the public via CCTV has therefore moved into second generation deployments without the effects of the first generation applications being fully understood.

An impetus behind increased CCTV adoption has been a set of CCTV evaluations that report decreases in crime and public disorder following surveillance system installations (Armitage, 2002; Burrows, 1980; Gaylord & Galliher, 1991; Goold, 2004; Norris & Armstrong, 1999; Phillips, 1999; Poyner, 1988, 1992; Rao, 1985; Scherdin, 1992; Short & Ditton, 1996, 1998; Sivarajasingam & Shepherd, 1999; Surette, 1985; Tilly, 1993; Welsh & Farrington, 2002, 2004). One mechanism credited with generating a positive anticrime effect is the increase of official guardianship capability with CCTV (Brown, 1995). Official guardianship is enhanced when information about incidents obtained from routine camera surveillance is passed along from system monitor to local public safety agencies for coordinated responses. The increased use of CCTV systems, however, also raises the corollary issue of the loss of informal citizen guardianship of CCTV-surveilled public spaces (Norris & Armstrong, 1999). This concern is stated by Landry and Bianchini (1995):

Attempts are being made to shield areas and make them as safe as possible, sometimes by cutting them off or controlling them through closed circuit television systems. This is the case of many indoor shopping malls as well as corporate plazas, executive housing developments and even some affluent residential streets. CCTV systems have reduced crime, but technology is becoming a substitute for people and the natural surveillance that comes from human interaction. (p. 7)

In sum, an unresolved concern is that CCTV cameras will reduce traditional informal citizen surveillance and intervention, in effect that citizens will call the police less often when they see an offense or suspicious person. Fyfe (1996) summarizes this concern: "Instead of worrying about 'Big Brother' watching them, the public may perceive that 'Big Father' has sorted everything out" (p. 43). If true, the effect would be increased bystander indifference and reduced citizen propensity to report incidents.

The possibility of CCTV causing a reduction in informal citizen guardianship is not a trivial issue. Prior evaluative research suggests that CCTV reduces crime more effectively through a crime deterrent effect as opposed to a crime detection effect. In addition, CCTV systems have not been found to be able to independently reduce crime. Thus, continued citizen involvement in CCTV-surveilled areas is important. In sum, the interactions among criminals, victims, and bystanders are central to CCTV's crime-reduction ability (Kennedy, 1990, p. 239; Landry & Bianchini, 1995, p. 7).² A consensus that has emerged from the research literature is that CCTV systems need to be coupled with police presence and citizen involvement to be fully effective (Graham, Brooks, & Heery, 1996; Groombridge & Karim, 1994; Tilley, 1993; Webb & Laycock, 1992; Welsh & Farrington, 2004). Therefore, if the installation of CCTV systems results in the reduction of vigilance by persons in the camera's fields of view, the net effect on crime could be counterproductive.

From this orientation, an untested hypothesis regarding CCTV is generated: Its deployment in public space results in the substitution of formal technological surveillance for traditional informal citizen surveillance. In gist, the normal surveillance of public spaces by people occupying the space will be degraded. As a result, unwanted behaviors, usually reacted to by others who would either intervene directly or summon law enforcement officers, will be responded to less often. The hypothesized psychological process is that as persons in a CCTV area become aware of the cameras, they will rationalize: Why get involved when the camera sees all and the police are already aware of what's going on? When stated as empirically testable propositions, this scenario generates the following hypotheses:

Persons aware of a CCTV system will be less likely to hold supportive attitudes toward guardianship actions than persons unaware of a system.

Areas with CCTV systems will display reduced calls for service related to informal guardianship events than areas without systems.

Only one prior assessment has addressed this possibility. Based on anecdotal evidence, Graham et al. (1996) state: "In the West End of Newcastle calls to the police have gone down since CCTV because people automatically assume any offence has been witnessed through the cameras" (p. 7). Unfortunately, no empirical support for this conclusion is offered. As an initial attempt to address this deficiency in the research, this study explored evidence for these hypothesized relationships using two methods. First, people were asked what they would do. Second, we examined what people did.

In the first approach, an examination of survey response differences between those respondents who were, without prompting, aware of surveillance cameras (24.4% of the respondents) and those who were not aware of the cameras was undertaken. The expectation is that preexisting knowledge of the cameras would be associated with attitudes associated with a reduced willingness to intervene and call the police. In the second approach, a time-series data set for calls for service in a CCTV-surveilled area and a comparison control zone were analyzed.

The CCTV system used in this study was placed in the downtown urban center of a Southern U.S. city with a tourist-based economy. As part of a project with a local university, the first camera was mounted on October 26, 2001, at the intersection of two streets heavily utilized by pedestrians and traffic. Following system setup and technical field tests, a four-camera system became operational on April 20, 2002. The cameras were mounted on corner streetlight poles with signs announcing their presence and purpose. Three periods are examined in this study. The first period is the precamera period, which is the 94 weeks prior to the first camera installation, from January 2000 to the week of October 26, 2001, when the first camera was installed in the intersection. The second period is the camera setup period, which covers the 26 weeks of system setup and field test from the week of October 26, 2001, to the week of April 20, 2002. The third period is the camera operational period during which the four camera CCTV system was fully operational. The camera operational period was 55 weeks from the week of April 27, 2002, to the week of May 12, 2003.

METHODOLOGY AND RESULTS

CCTV AREA SURVEY ADMINISTRATION

This study is based on a random selection of persons entering the CCTV-surveilled intersection. Respondents were approached and requested to complete a brief survey. All surveys were administered between March 27, 2003, and April 14, 2003, between the hours of 9:00 a.m. and 11:00 p.m. Student surveyors, 34 in total, were trained to utilize a respondent-selection process that employed the random selection of persons walking through the intersection. Although the selection process did not ensure a random sample of persons utilizing the intersection, it eliminated selection bias on the part of the surveyors and ensured a random selection of pedestrians approached. The surveyors were requested to keep a tally of their number of

refusals and estimate, from physical appearance, the age, race (White, Black, Asian, not sure), gender, and dress (business, trade, uniform, or casual) of each person who refused. All respondents were asked if they were 18 years of age and older. A total of 287 persons from the camera-surveilled intersection was surveyed.

The obtained sample was 61.1% male and 38.9% female. Also, 17.8% were Black, 11.8% were Hispanic, and 62.7% were White. Comparatively, the most recent census results report city demographics as 50% female, 18% Black, 18% Hispanic, and 68% White (U.S. Census Bureau, 2004). Thus, when compared to the 2000 census figures, the downtown sample well matches the proportion of Whites and Blacks and under-represents Hispanics and females. The education level of survey respondents is about equally divided among those with high school diplomas (26.8%), associate's degrees (26.5%), and bachelor's degrees (29.6%). Comparatively, the sample well matches the census education distribution, with 82% of the census sample having at least a high school diploma, compared to 82.9% of the study sample. The survey respondent's average age was 29.7, with a standard deviation of 9.33 years, which is also compatible with census estimates.³ Although not designed to obtain a random sample of residents, the present study obtained a sample that does match the demographics of the larger metropolitan region in a number of areas and is felt to successfully tap a representative cross-section of visitors to the CCTV-surveilled area.

To examine for differences between persons aware of the CCTV system and those not aware, the surveyors were instructed to not point out or mention the cameras to the survey respondents prior to administering the survey. The survey instrument presented items in an order that did not reveal the existence of the CCTV system until measures of guardianship behavior were collected. For example, the survey instrument first asked respondent's for their self-reported likelihood of helping another person as a general concept. After this datum was collected, respondents were then asked about their likelihood of intervening and how they might intervene in response to a specifically described scenario. After obtaining these responses, the unprompted awareness of the CCTV system operating within the intersection was measured by asking respondents if they knew of any surveillance cameras in the area. Following the distinguishing of respondents who were aware of the cameras from those who were unaware, all respondents were informed about the surveillance cameras in the intersection and asked a set of questions aimed at measuring attitudes toward CCTV and its use in the downtown area (see Table 1).⁴

TABLE 1. Selected Attitudes Toward CCTV Cameras

	<i>Yes</i>	<i>No</i>	<i>Unsure</i>
Would the surveillance cameras make you feel safer walking through the Central and Orange intersection alone after dark?	50.9	36.6	11.1
Would you be opposed to cameras being installed in other places in the downtown area?	28.6	56.1	15.3
Are you concerned that the use of surveillance cameras might result in fewer police officers being assigned to this area?	33.1	44.9	21.6

CCTV AREA SURVEY ANALYSIS

Prior to being told about the existence of the CCTV surveillance camera system, when asked about having noticed surveillance cameras in the area, about one fourth (24.4%) of respondents said that they had noticed the CCTV cameras, and 66.2% were not aware (8.7% were unsure). Prior studies have reported low levels of public awareness of CCTV systems, and this proportion is similar to results previously reported. For example, based on a public survey in Britain, Horne (1996) reported that only one in three respondents knew of operating CCTV systems. Based on interviews of offenders, Short and Ditton (1998) similarly reported that most offenders learn of CCTV systems via the news media, not by noticing them in the street. It appears that the large majority of residents are not commonly aware of operating CCTV systems even when they have accompanying signage and have received media coverage. In this study, knowledge of the cameras was not related to any demographic variable, and respondents from all ethnic groups, genders, ages, and educational levels were as likely to be aware or unaware of the CCTV cameras.⁵

Regarding guardianship, eight survey items examine attitudes associated with a self-reported willingness to intervene. In the first guardianship item, respondents were asked to respond to, on a 1-to-5 scale, how likely they would be to try to help someone in trouble in the area. The additional seven survey items offered respondents possible actions that they could pursue when confronted with a potentially serious event. The scenario presented to the respondents involves a man pushing a woman down and standing over her yelling. Thus, the event involves a simple assault. No weapons are mentioned, but the scenario does portend the realistic possibility of forthcoming harm to the victim. Unlike the more general item, this set of questions describes a specific event and lessens the problem of respondents simply answering as socially expected, that is by stating that they would be helpful.

TABLE 2. How Likely Would You be to Try to Help Someone in Trouble When in This Area?

<i>Aware of CCTV</i>	<i>Not at All</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Very Likely</i>
Yes	9	22	47	58	53
%	4.8	11.6	24.9	30.7	28.0
No	7	10	16	18	19
%	10.0	14.3	22.9	25.7	27.1
χ^2	3.088				
Sig	.543				

The choices allow respondents to pick exactly how they might be helpful and decide which interventions they would pursue and which they would reject. Of the seven actions offered, three require direct intervention and involvement with the arguing couple (calm the man down, help the woman up, separate them), two others are active but not directly intervening (get others to intervene, look for police), one is helpful but passive (wait for police), and one is avoiding (move away). Conceivably, an individual could consecutively perform six of the seven actions during the incident.

The single-item self-reported assessment revealed that, overall, most respondents (55.1%) see themselves as likely to intervene. Still, about 1 in 5 respondents (19.6%) report that they would not be likely to help someone in trouble. When this distribution is examined after controlling for knowledge of the CCTV system, as reflected in Table 2, no significant differences between the aware and unaware groups emerge. In fact, those respondents aware of CCTV show a slightly higher percentage of reporting their likeliness to help (58.7% of the CCTV-aware respondents responded that they were likely or very likely to help someone in trouble, compared to 52.8% of the unaware respondents). Although these differences are not statistically significant, they are also in the opposite direction of a hypothesized CCTV guardianship suppression effect and clearly do not support the operation of such an effect.

Looking at the survey results associated with the arguing couple scenario, the suppression hypothesis predicts that a lower likelihood of intervention should appear in respondents with knowledge of the cameras. A CCTV guardianship suppression effect should be associated with a relaxation of respondents' willingness to become involved and a greater likelihood to be passive observers or to simply move away. The results show that, overall, a large majority of respondents indicated that they would seek out a police officer (82.6%), get other people to help (68.3%), and try to help the

TABLE 3. Number of Actions a Respondent Would Take

<i>Count</i>	<i>Frequency</i>	<i>%</i>
0	12	4.2
1	35	12.2
2	25	8.7
3	39	13.6
4	57	19.9
5	39	13.6
6	56	19.5
7	24	8.4
Total	287	100.0

Note: The response *move away* was reverse coded to reflect a willingness to stay nearby, the more helpful action.

TABLE 4. Individual Interventions: Percentage Stating They Would Not Take Selected Action

<i>% Who Would Not</i>	<i>CCTV Aware</i>	<i>CCTV Unaware</i>	<i>Sig^a</i>
Wait for police	43.4	40.6	.720
Stay	38.8	29.8	.257
Separate couple	36.5	41.0	.573
Calm person down	35.2	39.7	.561
Help person up	20.4	15.5	.408
Get others to help	16.7	13.3	.539
Look for police	12.7	8.6	.349

a. Null—no difference between CCTV aware and CCTV unaware groups.

woman up (64.5%). Less than half reported that they would try to calm the man down (45.3%) or separate them (40.4%) or wait for the police to come (45.6%). About one fifth (22%) indicated that they would move away. Thus, most indicate they would intervene in some fashion, usually by looking for a police officer. Few chose only one action; the average number of actions indicated per respondent was four, and a small group indicated that they would try everything (see Table 3). Demographic differences emerged only for gender, with females more likely to get others to help and wait for the police and less likely to move away. Females were also less likely than males to take actions potentially involving physical intervention such as trying to calm the man down, helping the woman up, or separating the man and woman.

Focusing on those respondents who were definitive in their responses, choosing either yes or no for the proposed actions, and eliminating all *unsure* respondents, Table 4 compares the CCTV-aware with the CCTV-unaware respondents. The data in Table 4 present the percentage from each

group who stated that they would pursue a nonhelpful, nonintervention action. The guardianship suppression hypothesis predicts, therefore, that the CCTV-aware group should display higher percentage values.

As reflected in Table 4, although the camera-aware group does indicate less willingness to take five of seven actions as a guardianship suppression effect would predict, there are no significant differences between respondents' self-reported willingness to intervene in any of the listed ways and their knowledge of the CCTV system. In addition, two of the proportional differences are in the wrong direction if a guardianship effect were active: The camera-unaware group shows a greater number of respondents unwilling to take the actions of separating the couple or calming the man down.

Similarly, when an interactive effect of gender is examined, results initially suggest that a CCTV-suppression effect is present for some actions. Females who are aware of the CCTV are less likely to wait for the police (60.0%) and more likely to move away (61.1%) than are females not aware of the cameras (70.7% and 41.9%, respectively). However, CCTV-aware females are also more likely to state that they would try to calm the man down (50.0%) and try to separate the man and woman (52.9%) than are CCTV-unaware females (37.2% and 31.8%, respectively). None of these within-gender differences is statistically significant.

In gist, the survey results do not support a guardianship suppression effect and cannot be interpreted as evidence of a significant informal guardianship suppression effect resulting from CCTV surveillance. The direction of some of the results is suggestive, but the results in total are not supportive of guardianship suppression. However, there is always a validity concern when using survey responses as indicators of behavior. People do not always act the way they say they will. Therefore, a second analysis that utilized actual measures of citizen behavior in the CCTV area prior to and following the installation of the camera system was undertaken. The municipal police department provided daily call-for-service data covering the CCTV area and a control zone from January 1, 2000, to May 15, 2003.⁶ These data sets were aggregated to weekly totals for 175 total weeks of data. If an informal guardianship suppression effect were generated by the presence of the CCTV system, calls for service, in particular calls that would be generated from informal guardianship activity such as calls associated with suspicious persons, would decline in the CCTV area after the cameras became operational but would not decline in a control sector.

CALLS FOR SERVICE DATA CONCEPTUALIZATION

The literatures on CCTV and crime displacement suggest that the effect of public area camera systems should vary by the geographic proximity of the camera systems (Barnes, 1995; Barr & Pease, 1990; Brown, 1995; Burrows, 1980). Conceptually, there are three zones. The first zone is the area physically near a visible camera system, herein termed the *proximity zone*. For this study, this would be the downtown intersection in which the four CCTV cameras are mounted. Anyone in this area is clearly in a camera's eye. An advantage of the data set utilized for this study is that intersection calls for service are operationally labeled by the local police department as "the intersection of Central and Orange," and as recorded these calls for service are all street events in the defined proximity zone. Examining these calls as a distinct group avoids confounding effects from mixing calls for service generated by events inside buildings and thus outside of the view of the cameras system with street events visible to the cameras. As pure street events located in the camera intersection, proximity calls should most reflect any guardianship suppression effect.

The second zone would be the area covered by a camera's field of view (FOV). For this system, the cameras provide views of half a block in each direction from the intersection. The FOV area delineates the street area that the police effectively can surveil. Because a camera's range is not readily determinable by citizens, persons may or may not see the cameras or be aware that they are under surveillance in this FOV zone.

In addition, CCTV system effects that spill beyond camera FOV to adjacent areas have been noted in the literature. The literature suggests that effects can be either positive in a diffusion of deterrence effect or negative in a displacement of crime effect. This adjacent zone is operationally defined as the two adjacent police department statistical report areas that meet at the CCTV camera system intersection. In addition, a fourth control zone area was selected from another portion of the city. The control zone is similar to the camera system zones in having a number of tourist-oriented businesses and tourist foot traffic. It does not have police-operated surveillance cameras nor known, visible private camera systems.

It is hypothesized that a guardianship effect on calls for service should increase as one moves closer to the surveillance cameras. Therefore, the proximity calls for service should show the strongest guardianship reduc-

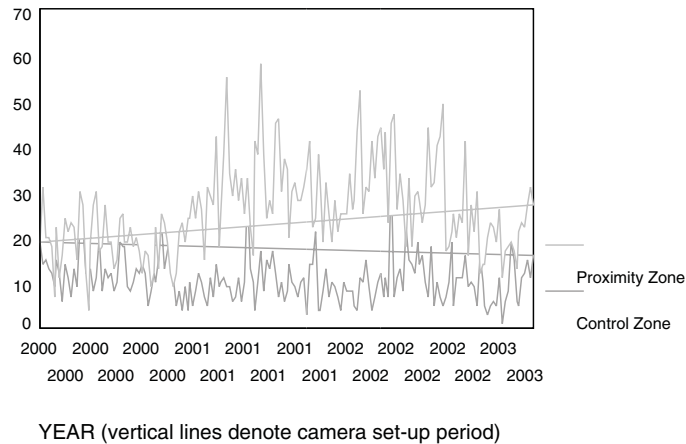


FIGURE 1: Total Calls for Service: Camera Proximity and Control Zones

tion, followed by FOV calls and adjacent calls. Miles from the CCTV system, the control zone is theoretically beyond a CCTV influence. Representing the two predicted extremes for CCTV effect, the analysis will focus on comparing the proximity zone (which should show maximum CCTV effects) and the control zone (which should show no CCTV effects).

Across the study's time frame, proximity calls numbered 4,526, or an average of about 26 per week. The control zone did not undergo the same level of calls for service, numbering 1,886 calls for service, for an average of 11 per week.⁷ As shown in Figure 1, the two areas were roughly equivalent for calls for service through 2000, when the camera intersection became a much more active locale.

Calls for service are also conceptually broken out into three call-genre groups, in addition to the spatial zones examined. Reasoning that not all types of calls for service should be equally related to informal guardianship actions and suppressed by the installation of a public CCTV system, a set of 11 call codes, hereafter termed guardianship calls, were selected as calls where a CCTV guardianship suppression effect should theoretically appear. These guardianship calls involve visible street events where the presence of a CCTV system should logically influence individuals to forego calling the police if, in actuality, they are being influenced by the presence of CCTV to assume that the event is already being surveilled. Guardianship calls include drunk pedestrian, suspicious person or vehicle, car burglary, general disturbance, noncommercial robbery, man down, nonemergency assistance, vandalism, trespass, battery, and drug violation. All other calls

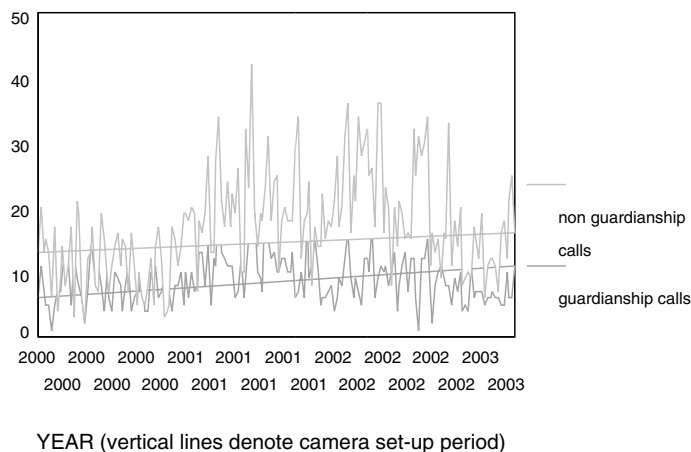


FIGURE 2: Proximity Calls for Service: Nonguardianship and Guardianship

for service are placed into a nonguardianship call group. Figure 2 displays the nonguardianship and guardianship calls for service for the proximity zone.

The calls for service regarding suspicious persons and vehicles were further examined as a distinct subgroup of the guardianship calls. In that these calls reflect events that do not clearly involve a crime and where there are no visible victims, they reflect the single most likely instances where a guardianship suppression effect from CCTV should appear. In these situations, citizens need not ignore a clear crime or someone needing assistance to resist calling the police. They simply need to decide not to report a suspicious situation. The total number of calls by area and group are provided in Table 5.

Guided by this conceptualization, a number of empirically testable hypotheses are generated. First, a CCTV guardianship suppression effect should theoretically be limited to guardianship calls for service as operationally defined. Second, a guardianship suppression effect should be strongest in the calls for service associated with reporting a suspicious person or event. Third, a guardianship suppression effect should be related to camera proximity, increasing as one nears a nonhidden camera. To clarify, the specific hypotheses state

A CCTV guardianship suppression effect will increase with camera proximity. When compared with nonguardianship calls for service, guardianship calls for service will show greater numerical decline in the camera proximity zone than in the control zone.

TABLE 5. Calls for Service by Area and Type

	<i>Total</i>	<i>Weekly Average</i>
Proximity nonguardianship calls	2,986	17.0
Proximity guardianship calls	1,540	8.8
Proximity guardianship suspicion calls	908	5.1
Control nonguardianship calls	1,132	6.4
Control guardianship calls	754	4.3
Control guardianship suspicion calls	313	1.7
Field of view (FOV) nonguardianship calls	5,010	28.6
FOV guardianship calls	3,729	21.3
FOV guardianship suspicion calls	1,790	10.2
Adjacent nonguardianship calls	20,878	119.3
Adjacent guardianship calls	17,206	98.3
Adjacent guardianship suspicion calls	8,660	49.4

A CCTV call suppression effect will be stronger on guardianship calls for service than on nonguardianship calls for service. The time trend for guardianship calls will numerically decline more than nonguardianship calls in the camera proximity zone.

A CCTV guardianship call suppression effect will be strongest within the calls for service related to suspicious persons and vehicles when compared with other guardianship and nonguardianship calls for service. The time trend for suspicion calls for service will numerically decline more than the other call groups in the camera proximity zone.

CALLS FOR SERVICE ANALYSIS

The first step in the analysis is to examine the proximity calls for service for evidence of a guardianship suppression effect. Table 6 reports the weekly averages for the proximity and control zones for the precamera, camera setup, and camera operational periods. In addition to the weekly averages for calls for service, Table 6 also supplies a weekly ratio of guardianship calls to total calls for service and a ratio of suspicion calls to total calls. One indicator of a camera guardianship effect on suspicion or interest calls would be a change in the ratio of guardianship and suspicion calls to the total number of calls in the proximity zone. If guardianship calls are being suppressed, they will be a smaller percentage of all calls for service after CCTV is installed and operational. Therefore, the hypothesized expectation would be for these ratios to decline after the cameras are installed.

Looking first at the control zone, nonguardianship calls decline from the precamera period to the camera setup period, returning to their precamera

TABLE 6. Average Number of Weekly Calls by Time Period for Proximity and Control Zones

<i>Period</i>	<i>Nonguardianship Calls</i>	<i>Guardianship Calls</i>	<i>Suspicion Calls</i>	<i>Suspicion to Total Ratio</i>	<i>Guardianship to Total Ratio</i>
Proximity zone					
Precamera	15.1	9.1	5.3	.22	.39
Camera setup	21.8	8.8	5.1	.17	.29
Camera operational	18.1	8.2	4.9	.19	.32
Control zone					
Precamera	6.8	4.5	1.7	.15	.39
Camera setup	4.9	3.8	1.7	.20	.43
Camera operation	6.6	4.1	1.8	.18	.38

system level during the camera operational period. Guardianship calls for service display a similar pattern, and suspicion calls remain stable. When the ratio of suspicion and guardianship calls to the total number of calls for service in the control zone is examined, suspicion calls increase as a proportion of total calls during the setup period to about one out of every five calls. They decline slightly afterward but remain at a level higher than their precamera proportion. Guardianship calls account for about 2 out of every 5 calls for service in the control zone and show a pattern similar to the suspicion calls. None of these control zone shifts are significant, and they are also not patterned in a manner suggesting a widespread shift in calls for service that might mimic or mask a CCTV-guardianship effect.

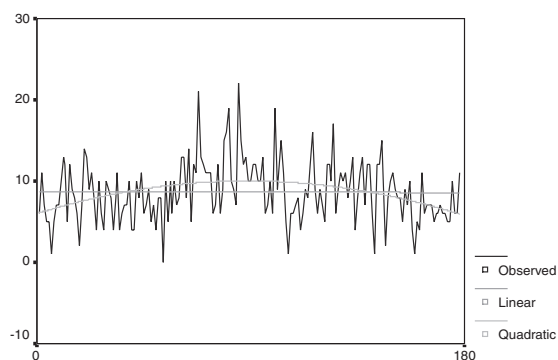
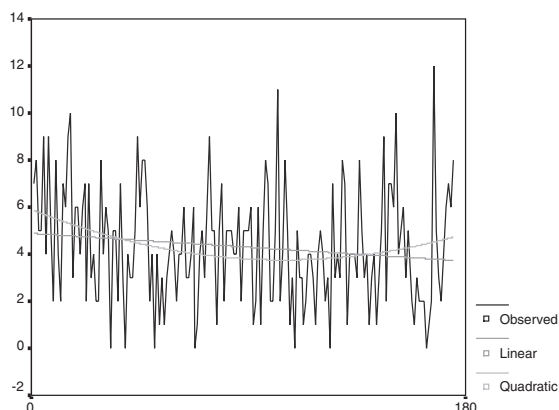
Looking next at the proximity zone, the average number of nonguardianship calls slightly increases in the camera operational period from the precamera time, a pattern not shown by the guardianship or suspicion calls, which show a slight, steady decline. Suggesting a guardianship suppression effect, suspicion calls made up about 23% of all calls and guardianship calls about 39% prior to the cameras. During the camera setup period, suspicion calls fell to 17% of the total, and guardianship calls to about 30%. During the operational period, the proportion of suspicion calls rose slightly to about 20%, and guardianship calls to about 32%. Although none of these shifts are significant, the pattern is at least in the correct direction if a call guardianship suppression effect is operating on calls for service.

Further analysis suggesting a guardianship suppression effect is shown via a data-curve-fitting process. A guardianship suppression effect would be best displayed empirically as a convex curve in the proximity zone by calls increasing prior to the camera, tailing off during camera setup, and

TABLE 7. Proximity Curve Fit Quadratic Models

	R ²	df	F	Sig	b0	b1	b2
Proximity zone							
Nonguardianship	.226	172	25.09	.000	6.45	0.268	-0.0013
Guardianship	.122	172	11.98	.000	5.98	0.094	-0.0005
Suspicion	.083	172	7.80	.001	3.35	0.061	-0.0003
Control zone							
Nonguardianship	.017	172	1.48	.231	7.51	-0.017	4.4E-05
Guardianship	.052	172	4.74	.010	5.90	-0.041	0.0002
Suspicion	.042	172	3.75	.025	2.55	-0.023	0.0001
Field of view zone							
Nonguardianship	.066	172	6.11	.003	25.39	0.141	-0.0009
Guardianship	.178	172	18.58	.000	17.29	0.170	-0.0011
Suspicion	.108	172	10.40	.000	8.517	0.081	-0.0005
Adjacent zone							
Nonguardianship	.090	172	8.48	.000	131.31	-0.210	0.0006
Guardianship	.143	172	14.35	.000	88.24	0.400	-0.0024
Suspicion	.112	172	10.82	.000	41.68	0.264	-0.0015

decreasing after the system becomes operational. As shown in Table 7, a quadratic curve does best describe the data trends across the three periods and significantly fits all three call groups.⁸ Providing a visual comparison, the plots for the proximity and control zone guardianship calls are shown in Figures 3 and 4, respectively. Inspection of the plots suggests that a CCTV guardianship suppression effect is occurring. The proximity zone guardianship calls increased prior to the CCTV system and decline afterward. In the control zone, the opposite is observed. Guardianship calls decreased prior to the CCTV system and increased afterward. However, when the trends for the nonguardianship calls are examined, an interpretation of a CCTV guardianship effect is brought into question. As shown in Figures 5 and 6, in the proximity zone, the fit of the quadratic curve for nonguardianship calls increases from the precamera to setup periods and declines after the camera system became operational. In the control zone, the nonguardianship calls are random in pattern, with neither a linear nor quadratic curve significantly fitting the data (see Table 8). It is noteworthy that in the proximity zone, the quadratic curve fit is greater for the nonguardianship than for the guardianship calls ($R^2 = .22$ vs. $.12$, respectively; see Table 7 and contrast Figures 3 and 5), a result opposite to the expected hypothesized pattern where the stronger effect should be in the guardianship calls. Thus, although the pattern found within the guardianship calls suggests a weak suppression of

**FIGURE 3: Proximity Guardianship Calls****FIGURE 4: Control Zone Guardianship Calls**

guardianship, the pattern found in the nonguardianship calls is even more pronounced.

The investigation for a guardianship suppression effect was also pursued via an examination of the linear slopes of the data across the study's three periods. In this step, the data were trisected into the three periods of precamera, setup, and system operational, and the linear regression line slopes for each period by zone were examined. It can be seen in Table 9 that in the proximity zone, the slopes for the precamera and postcamera time frames are significantly different from zero for all call types, and, important for this study, the operational time slopes are significantly different from the

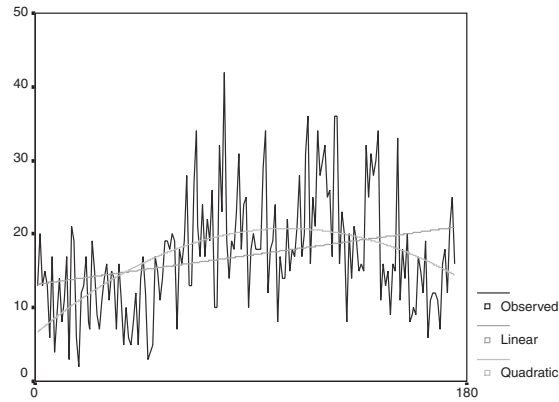


FIGURE 5: Proximity Nonguardianship Calls

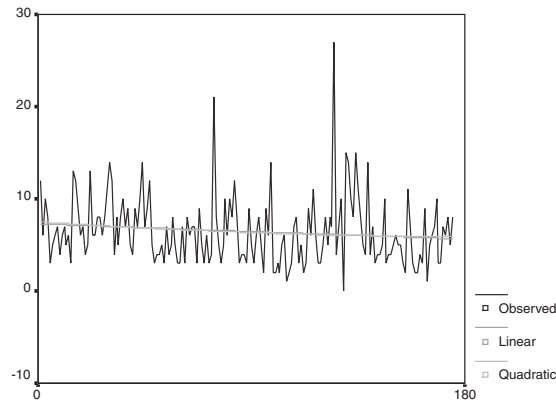


FIGURE 6: Control Nonguardianship Calls

TABLE 8. Control Zone Fit for Linear Models

	R^2	df	F	Sig	$b0$	$b1$
Nonguardianship calls	.016	173	2.83	.094	7.2833	-0.0093
Guardianship calls	.018	173	3.25	.073	4.8841	-0.0065
Suspicion calls	.003	173	0.48	.487	1.9194	-0.0015

precamera slopes. Again suggesting a guardianship suppression effect, within the proximity zone, guardianship and suspicion calls significantly

TABLE 9. Proximity and Control Zone Calls for Service: Pre-CCTV, Setup, and Post-CCTV Slopes

	<i>Proximity Slope (B)</i>	<i>Control Slope (B)</i>
Guardianship		
Pre-CCTV	.061 ^a	-.020 ^a
Setup	-.036	-.084
Post-CCTV	-.085 ^{a,b}	.013
Suspicion		
Pre-CCTV	.038 ^a	-.015 ^a
Setup	-.049	-.031
Post-CCTV	-.065 ^{a,b}	.002
Nonguardianship		
Pre-CCTV	.133 ^a	-.018
Setup	.334	.005
Post-CCTV	-.228 ^{a,b}	-.092 ^{a,b}

a. Significant difference from 0.

b. Significant difference from precamera slope.

increased prior to the camera systems being installed and significantly decreased following the system becoming operational. However, when the nonguardianship call slopes are examined, they are also seen to have significantly increased prior to the CCTV system and significantly decreased after it became operational. The slopes in the control zone display a different, more haphazard pattern. In the control zone, nonguardianship calls significantly trended downward in the operational period; guardianship and suspicion calls significantly declined in the precamera period.

Looking at the analysis thus far, when the calls for service for the control zone are examined, a pattern significantly different from the proximity zone is found. Whereas in the proximity zone nonguardianship calls display a convex pattern as they increased prior to the CCTV system and declined afterward, in the control zone nonguardianship calls display a random trajectory. Both zones show a decline in nonguardianship calls for service in the operational CCTV period. Also in the control zone, for guardianship and suspicion calls, a quadratic curve significantly fits the data but in a concave trend, declining prior to CCTV and increasing afterward. Adding the fact that the linear slopes are significantly different from zero in the control zone only in the precamera period, the proximity zone emerges as a unique area within the city. The proximity zone displays a call pattern that encompasses both guardianship and nonguardianship calls for service. In the proximity zone, all types of calls for service increased prior to the CCTV system, held steady during its setup, and then significantly declined after

TABLE 10. Average Number of Weekly Calls by Time Period for Adjacent and Field of View (FOV) Zones

<i>Period</i>	<i>Nonguardianship Calls</i>	<i>Guardianship Calls</i>	<i>Suspicion Calls</i>	<i>Suspicion to Total Ratio</i>	<i>Guardianship to Total Ratio</i>
Adjacent zone					
Presystem	124.0	101.9	51.3	.22	.45
System setup	111.0	95.1	45.5	.21	.46
Postsystem	115.0	93.6	48.1	.23	.44
FOV zone					
Presystem	28.9	22.4	10.9	.21	.43
System setup	32.0	21.5	9.8	.18	.40
Postsystem	26.4	19.3	9.2	.20	.42

the system became operational. The control zone, on the other hand, shows nonguardianship calls as flat prior to the CCTV system cameras and guardianship and suspicion calls declining in the precamera period and flattening out during its operational time frame.

Thus, at this stage of the analysis, unless one argues for a general, broad-based CCTV call suppression effect that affects all types of calls, the similar pattern for guardianship calls, suspicion calls, and nonguardianship calls in the proximity zone belies a CCTV informal guardianship suppression effect. In fact, the shifts are seen to be greater in the nonguardianship calls for service than in the calls that theoretically should display the greater guardianship suppression effect. Although the results may suggest a general crime deterrence effect that results in an across-the-board reduction in calls for service in the CCTV camera intersection, there is no evidence of an additional guardianship call suppression effect. The types of calls where such an effect should be the strongest instead show a weaker numerical decline.

Last, turning to the FOV and adjacent zones, it can be seen that the calls for service patterns in the FOV and adjacent zones also mimic a guardianship call suppression effect. First, as might be expected, the FOV zone had a call pattern similar to the proximity zone for nonguardianship calls (compare Tables 6 and 10), increasing from the presystem period to the system setup period and then declining during the system operational time frame. However, there is little change in the ratio of guardianship or suspicion calls for service in either the adjacent or FOV zones, with suspicion calls stable at about 22% of total calls and guardianship calls at about 45% of the total across all three periods. Thus, shifts in the proportion of types of calls are

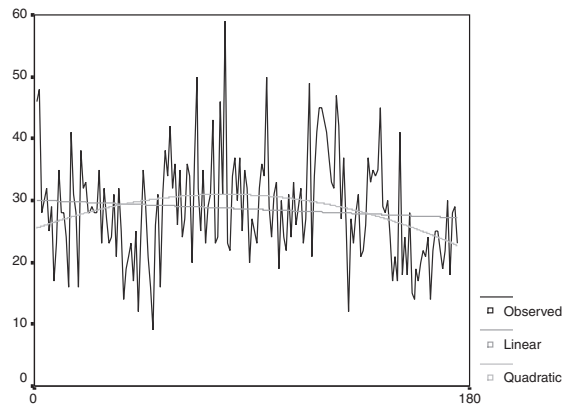


FIGURE 7: Field of View Nonguardianship Calls

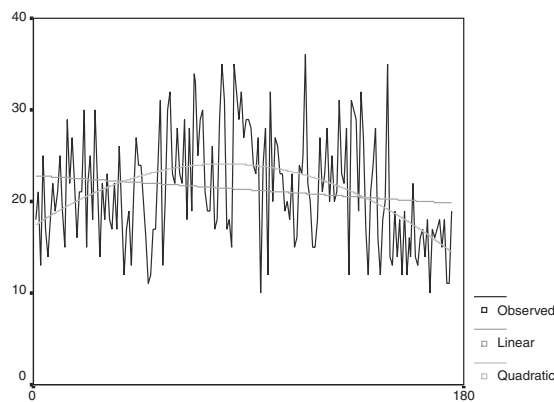


FIGURE 8: Field of View Guardianship Calls

not significant in the areas surrounding the cameras, and the proportions of calls that theoretically should display a guardianship effect remain stable. Along similar lines, in the FOV zone, a convex quadratic curve significantly fits all three types of calls.⁹ Here again the FOV quadratic form suggests a possible guardianship effect. Unlike the proximity zone, however, the FOV guardianship calls show the strongest convex quadratic pattern (see Figures 7 and 8).

In the adjacent zone, the linear model outperforms the quadratic curve for the nonguardianship calls (see Figure 9). The quadratic curve outper-

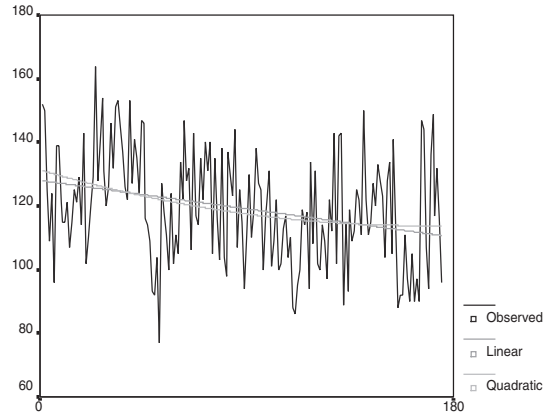


FIGURE 9: Adjacent Nonguardianship Calls

TABLE 11. Adjacent Zone Linear Model Results

	R^2	df	F	Sig	b0	b1
Nonguardianship calls	.083	173	15.62	.000	128.021	-0.0991
Guardianship calls	.010	173	1.70	.195	100.944	-0.0298
Suspicion calls	.000	173	3.0E-06	.999	49.488	-3.E-05

forms the linear model for the guardianship and suspicion calls for service (see Figure 10; see Table 11). Collectively, these results further argue against a CCTV guardianship suppression effect. The revealed reality is that guardianship calls for service were undergoing a pattern suggestive of a call suppression effect across a broad area of the city. The call pattern one would expect from a CCTV guardianship suppression effect is not unique to the proximity zone, where in fact the convex pattern indicative of a guardianship suppression effect is less pronounced than in areas farther from the cameras. Prior to the camera system, guardianship calls were increasing not only in the proximity zone but also in two patrol areas significantly removed from the CCTV camera system. Similarly, the guardianship calls leveled off in this broad area during the camera setup period and then declined during the CCTV operational period. The similar and weaker pattern observed in the proximity zone cannot therefore be interpreted as the result of a CCTV informal guardianship suppression effect (see Table 12).¹⁰

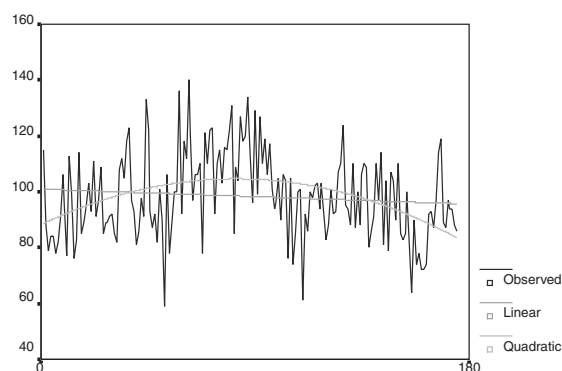


FIGURE 10: Adjacent Guardianship Calls

TABLE 12. Slope Comparison

	<i>Field of View</i>		<i>Adjacent</i>	
	<i>Slope (B)</i>	SE	<i>Slope (B)</i>	SE
Nonguardianship				
Pre-CCTV	.036	.032	-.102	.062
Setup	.363	.209	-.216	.337
Post-CCTV	-.251*	.060	-.021	.149
Guardianship				
Pre-CCTV	.085*	.020	.301*	.054
Setup	-.010	.151	-.379	.295
Post-CCTV	-.213*	.043	-.224*	.104
Suspicion				
Pre-CCTV	.043*	.014	.218*	.036
Setup	-.050	.104	-.256	.215
Post-CCTV	-.126*	.028	-.114	.067

CONCLUSION

In this instance, what people say they would do does not conflict with what they have done. The survey results that show no relationship between CCTV awareness and guardianship actions are buttressed by the analysis of calls for service data. Neither knowledge of nor proximity to CCTV surveillance cameras appears to influence citizen guardianship actions. Instead, the evidence is more supportive of a general crime deterrence effect than of a guardianship suppression effect.

Thus, most survey respondents indicate that they would intervene in some fashion, usually by looking for a police officer. The only suggested difference found within respondents was not related to camera awareness but a speculative, nonstatistically significant difference between males and females, with females more likely to get others to help and wait for the police and less likely to move away or take actions involving physical intervention. Similarly, none of the three calls for service hypotheses empirically tested was supported. First, a CCTV guardianship suppression effect did not increase with camera proximity, and guardianship calls for service did not show greater numerical decline in the camera proximity zone than in the control zone. Second, a CCTV call suppression effect was not stronger on guardianship calls for service than on nonguardianship calls for service, and the time trend for guardianship calls did not numerically decline more than nonguardianship calls in the camera proximity zone. Third, a CCTV guardianship call suppression effect was not strongest within the calls for service related to suspicious persons and vehicles when compared with other guardianship and nonguardianship calls for service, and the time trend for suspicion calls for service did not numerically decline more than either group in the camera proximity zone.

Before concluding that CCTV guardianship suppression effects never occur, it should be noted that a suppression effect could arise under different field applications or system configurations. For example, in this study, police response to incidents viewed on the cameras was found to be haphazard (Shah & Surette, 2003). Thus, a guardianship suppression effect remains a possibility for systems associated with vigorous police reaction. Or guardianship suppression may arise only with systems after long-term deployments. Or perhaps a minimum threshold proportion of residents, for example 50%, must become aware of the cameras before guardianship suppression occurs. On the other hand, it also remains a possibility that CCTV systems increase citizen guardianship by making people feel that their failure to help will be observed and recorded and interpreted as callous or cowardly. There is no indication of such a guardianship enhancement effect in this study, however.

In conclusion, although this study does not eliminate the possibility of CCTV suppression effects ever arising, it does establish that such an effect is not an inherent result of simply setting up cameras. Although they should remain wary of negative consequences from installing unnecessary surveillance systems, practitioners and researchers can continue to experiment with public space surveillance systems without the expectation of an immediate decline in citizen guardianship.

NOTES

1. The use of video cameras to monitor public spaces is common in a number of other countries, including the United States. Prevalent in the United Kingdom, closed-circuit television (CCTV) systems were first launched there in the 1960s, and today British citizens are described as the most surveilled population in the world (Norris & Armstrong, 1998, p. 39). Horne (1996) reports that one of the first systems installed was in Cumbernauld, England, in 1961 (see Williams, 2003, for an historical overview).

2. Regarding the utility of such systems, Tilley (1993) for example, states, "The effect of CCTV appears to be enhanced when it is installed alongside other complementary measures, raising its credibility as a source of increased risk to the offenders" (p. 23). The psychological power of CCTV surveillance systems has also been anecdotally documented by Clarke (1994), who states, "Some [offenders] even confessed without being shown a playback, believing the mere presence of CCTV cameras meant they'd been caught in the act—when in fact the cameras had missed them" (pp. 28-29). A broad-based psychological effect on law abiding has also been credited to a surveillance effect (Marx, 1988). Gill and Loveday (2003), based on interviews with incarcerated offenders, report that offenders did not worry unduly about CCTV when planning offences but that those who had previously been captured by CCTV saw it as more of a threat.

3. The survey results were also compared with a prior survey conducted in the spring of 2001 in the same downtown area. The demographic distributions of the two surveys are also similar. The prior survey results were 41.2% female; 48.5% White, 14.0% Hispanic, and 26.5% Black; and 39.7% high school diploma, 22.1% associate's degree, and 22.1% bachelor's degree. The prior survey had a respondent's average age of 28.6.

4. In general, attitudes toward the use of CCTV were positive. Half (50.9%) felt that the cameras would make them feel safer walking through the intersection alone after dark. More than half (56.1%) would not be opposed to more cameras being installed in other downtown locations, and a minority (about 1 in 3) was concerned that the cameras might result in fewer police officers in the area. In terms of influencing future visits to the area, the cameras were seen as having no effect on the vast majority of respondents (69.3%). Also, 10% indicated that they would be less likely to visit the area in the future.

5. The percentage of respondents by demographic who were aware of the CCTV system is as follows: males 27.4%, females 28.3%; Blacks 23.8%, Whites 29.2%, Hispanics 20.0%; high school diploma 26.1%, associate's degree 25.0%, bachelor's degree 22.1%. The average age of those aware of the cameras was 31.1, as compared to 29.2 for those unaware. None of the differences is statistically significant.

6. Calls-for-service variables included incident number, signal, description, disposition, date, time, address, grid code, and district.

7. Calls for service within the cameras' fields of view totaled 8,739. Weekly values for proximity zone calls for service ranged from a low of 4 to a high of 58, with a standard deviation of 9.71. Control zone calls ranged from a low of 1 to a high of 34, with a standard deviation of 4.96.

8. Linear models were significant but marginally so for the nonguardianship calls ($R^2 = .082$, $F = 15.44$, $\text{sig} = .000$).

9. Quadratic curves outperform linear models, which are insignificant for all three call types.

10. The slope comparison for the field of view and adjacent zones confirms this conclusion. The guardianship calls were significantly increasing in both zones in the pre-CCTV period and were flat during the setup period, and they significantly declined during the CCTV operational period.

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Ray Surette, Ph.D., is a professor in the Department of Criminal Justice and Legal Studies, School of Health and Public Affairs, University of Central Florida. His research interests include the interactions among the media, crime, and criminal justice and the application of media-based technology in the criminal justice system.