THE CITY OF PULLMAN SAFETY CAMERA INITIATIVE: RESOLVING NEIGHBORHOOD DISORDER THROUGH INNOVATIVE TECHNOLOGY AND COMMUNITY COLLABORATION

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Executive Summary

The City of Pullman had a big problem. Between 2002 and 2007, the city had witnessed a 41% increase in violent crime and assaults[i] . Attempting to combat the problem, the Pullman Police Department implemented various policing strategies and public policy measures. The Pullman City Council passed ordinances regulating nuisance parties[ii], banning alcohol consumption and open containers in public places[iii], and banning offenses against peace and order in[iv]. In spite of these efforts, the Department's Uniform Crime Reporting (UCR) data showed a 45% increase in Part 1 Violent Crimes between 2008 and 2010.

To combat the problem of increasing violent neighborhood assaults on College Hill, the Pullman Police Department, in collaboration with research partners at Washington State University (WSU), proposed to launch an evidence-based safety camera project. The project, called *Pullman Police Department's Smart Police Safety Camera Initiative*, or *SCI*, facilitated the installation of a network of five (5) safety cameras in a major crime "hot spot" adjacent to the WSU campus identified by a pre-implementation evaluation performed by the WSU research partners. The project included software that would enable access to live camera feeds by officers, whether they were at the station or in their patrol units. The goals of the *SCI Project* were to: (1) deter individuals from engaging in criminal behavior in the target area, (2) enhance criminal investigations, including investigation of previously unreported crimes, and (3) provide actionable intelligence to support interventions and responses to developing situations.

The research partners for this grant were a collaboration between the Division of Governmental Studies and Services (DGSS) – an applied outreach and public policy research unit – and the Department of Criminal Justice and Criminology, at Washington State University

(WSU). The DGSS component of the research team was led by Director Michael Gaffney, and the Department representative was Dr. Zachary Hays.

The project was initiated with research designed to serve as a baseline for evaluation and to provide data to inform camera placement. Analysis of Calls for Service (CFS), UCR records, and stakeholder interviews informed the selection of the final camera locations, along with technical considerations. In parallel with this effort, the Department conducted a robust public awareness campaign, which included press and web strategies as well as public meetings. Although camera installation was delayed six months by a lengthy procurement process, as well equipment delivery delays, the planned use of the cameras began in February 2013. A non-cost timeline extension was granted, so the anticipated research model was not disrupted by initial project delays.

The *SCI Project* evaluation was originally designed to produce two sets of results: (1) the effectiveness of the cameras in reducing criminal activity in the target area, and (2) the effect of the cameras on public perceptions of the Pullman Police Department. Unfortunately, due to the small number of criminal incidents that took place in the target area during the project period (less than 40 over an 18-month period), the research team was unable to conduct the statistical analyses of official Department data that were proposed in the grant application, although there was a reduction in overall crime in the area.

In place of a quantitative analysis, the research partners instead sought to conduct a number of qualitative interviews with key criminal justice professional stakeholders, including the County Prosecuting Attorney and Pullman police officers, to assess the effectiveness of the cameras. Interview subjects reported that the cameras achieved each of the three crime reduction

goals described above. Subsequently, given both the overall drop in crime and the results of our qualitative interviews, we concluded that the *SCI Project* was successful in reducing crime.

A second important goal of the *SCI Project* was to determine whether the installation of the safety cameras would affect people's satisfaction with the Pullman Police Department. The research partners administered three waves of community surveys (before the cameras were installed, immediately after installation, and approximately one year after installation). Univariate analyses of the survey data revealed that respondents' satisfaction with the police increased at each wave of the survey. Moreover, respondent expectations for the effectiveness of the cameras also increased over the project period, while respondent satisfaction with the project went from being initially negative at Wave I to being positive at Wave III. Interestingly, however, despite the use of the cameras, respondents' fear of crime increased during the course of the *SCI Project*.

Multi-level modeling multivariate analyses of the survey data revealed that respondents' fear of crime was the best predictor (negative) of satisfaction with police, while beliefs about the cameras' ability to reduce crime and satisfaction with the *SCI Project* both positively predicted satisfaction with the police. Demographic and crime-level controls were mostly non-significant. Given these results, we concluded that the cameras and the *SCI Project* did not reduce satisfaction with the Department, but rather increased it over the course of the project period. Based on both our qualitative and quantitative analyses then, we conclude that the cameras had a positive impact on crime and did not decrease satisfaction with the police.

Targeted Problem

The City of Pullman, located in rural southeastern Washington State, is home to Washington State University (WSU) and is a quintessential college town. Of the nearly 30,000[v]

residents, census records indicate that nearly fifty percent of the population is comprised of 18 to 24 year-olds[vi]. Like many college towns, Pullman has issues with public safety and neighborhood disorder which are fueled by the interaction between a young population and access to off-campus recreational opportunities. Geographically, Pullman is comprised of four hills, and the northeast hill, known as College Hill, contains the WSU campus, its off-campus Greek Row, and a concentration of eating and drinking establishments. College Hill also contains many duplexes and apartment complexes which provide the majority of the off-campus housing for university students, and which is interspersed with more traditional non-student residences. It also happens to be the "hot spot" for nearly all violent crime occurring in Pullman.

Washington State University has long had a reputation as a party school. In 2009, it was ranked #16 on *Playboy's* listing of top party schools, and has made multiple appearances on *The Princeton Review's* annual list of top party schools[vii]. The alcohol-fueled partying has often turned violent; acts of public intoxication, disorderly conduct, fighting, property damage, and sexual assaults are the unfortunate consequences of a student culture which has given rise to the "party school" image.

In the past, the Pullman Police Department (Department) has adapted various policing strategies and public policy measures in an attempt to enhance safety, including more proactive foot patrols of College Hill and the establishment of the College Hill Beat Officer position. The College Hill beat officer works to build direct relationships with members of the fraternities and sororities, student renters and long-term residents, and businesses (including alcohol establishments) on College Hill. Additionally, the Department worked with the Pullman City Council to pass ordinances regulating nuisance parties in 2007[viii], banning alcohol consumption and open containers in public places in 2007[ix], and banning offenses against peace and order in

2008[x].

Despite these efforts, in the years preceding the *SCI Project*, the level and severity of violent crime increased significantly. In 2008, there were two violent assaults within a one month period, each of which left the victims with broken jaws. Although both attacks occurred in a crowd, no witnesses to the crimes stepped forward, and the perpetrators were never identified[xi]. In 2009, a record number of people were taken to Pullman Regional Hospital for alcohol detoxification; one college-aged female registered a Blood Alcohol Concentration (B.A.C.) level of 0.475[xii], almost six times the legal limit[xiii]. In an interview with *The Spokesman-Review*, former Pullman Police Chief William T. Weatherly, Jr. noted that college students were reaching higher levels of intoxication by combining alcohol and caffeine, resulting in increased levels of violent behavior, such that"[it]take[s] two or three officers to control someone to get into an ambulance... A female was so violent she kicked a nurse in the face"[xiv]. The *SCI Project* was developed to address these continuing issues of safety, crime, and disorder.

Community Outreach and Collaboration

From its inception, the *SCI Project* was designed to include large components of community outreach, engagement, and input. Both the Department and the research partners identified the importance of engaging the wide array of community stakeholders, including WSU students, long-time Pullman residents, and business and property owners in and around the target area, and collaborated in that engagement. The project team anticipated that privacy issues would be a public concern, and therefore carefully planned out an intentional process to engage the public early on, with the specific goal of soliciting the community's input for the development of the Department's official policy governing access, use, and retention of the camera footage. The project team believed that by actively soliciting public participation throughout the project, the

Department would demonstrate its desire to be open and transparent, potentially mitigating some privacy concerns.

As part of this intentional community engagement, various community groups were asked to host public forums on the *SCI Project* and the Department's proposed camera policy. Forum participants were encouraged to ask questions about the *SCI Project* in general, voice their opinions and concerns, as well as provide specific feedback regarding developing the Department's camera policy that would potentially address their concerns.

Several community groups embraced the opportunity for public discourse, and three public meetings were held at three different locations, including in an alcohol-serving establishment in the identified "hot spot" of Adams Mall, during the first quarter of 2012. The entire progression of this process was posted on the Department's website[xv], including the various draft versions of the Department policy and complete question and answer sheets from each public forum. This process ultimately resulted in a finalized Department camera policy, which was posted on the Department website and included revisions suggested by community members. The public forums facilitated open communication between the Department and the community, engaging residents who previously may have only had limited, if any, contact (or simple limited positive contact) with the police. As noted by Jordan Graham, the Director of Community Outreach for the Association of Students at WSU (ASWSU), during an interview regarding the installation of the cameras, "I think that the fact that Chief Jenkins is making these forums public and that he wants feedback is really great. I think that having the opportunity for ASWSU to host the last one in March will be a really great opportunity for students to give some input and some feedback"[xvi]. Additionally, a suggestion from a citizen at the third public forum (held March 21, 2012) to enlist volunteers to monitor the camera feeds live led to the

development and implementation of the WSU Student Intern Camera Monitoring program, spearheaded by WSU Criminal Justice and Criminology professor Dr. David A. Makin[xvii].

Community outreach did not stop with the three public forums. Throughout the *SCI Project*, the Department issued several press releases updating the community on the status of the project (installation delays, student monitor program, major case investigations), all of which were posted on the website and shared via social media. Pullman Police Chief and *SCI Project* team member Gary Jenkins made a point of being accessible to the media. As noted in one article, "Jenkins has been police chief for a little more than a year and half. Since arriving in Pullman, he has also made an effort to improve transparency in the department's policing tactics."[xviii] Department staff also provided regular updates on the *SCI Project* to City leaders, community groups and organizations, ASWSU and various student organizations. Finally, the development and publicity surrounding the WSU student intern program also served to increase public awareness and trust of the project. Overall, this multi-faceted process of community engagement enhanced the public trust of the police department and enabled the successful implementation of the *SCI Project*.

The research partners, who had been engaged in the design, preparation, and submission of the original *SCI Project* proposal, were also very active participants in community outreach process. The research partners attended the public forums, assisted with development of responses to citizen questions about the project that were posted on the Department website, gave interviews to local and regional media, and assessed public engagement and sentiment during regular project team meetings. These meetings were held at least monthly throughout the entire grant period, and were supplemented by regular e-mail exchanges. This regular communication facilitated direct collaboration about the project, allowing potential problems to

be resolved expeditiously and potential opportunities to be acted upon in a timely fashion. The research partners, the Department, and their respective institutions, have all benefitted from the collaborative relationship developed over the course of the *SCI Project*. Other community projects, and joint ventures, such as the drafting of the first joint Comprehensive Emergency Management Plan in the state, can be directly linked to the strong partnership developed through the course of the *SCI Project*. Both the Department and the research partners anticipate this relationship will continue and thrive beyond expiration of this grant.

Strategies Employed

The primary strategy employed by the *SCI Project* was the installation of a network of safety cameras in a violent crime "hot spot" adjacent to the university campus in an area generally referred to by students and residents as Adams Mall. There were three primary and one secondary hypotheses underlying the decision to install public safety cameras on College Hill in the Adams Mall area:

1. The presence of cameras, and the large public notification signs required under Washington law, would have a deterrent effect on public acts of disorder, misconduct and crime.
2. The cameras would be useful in real time to allow responders to assess developing as they occurred, so as to better configure the officer and resource response to the situation.
3. The recorded data from the cameras would provide investigatory and evidentiary utility after the fact to support case investigation and prosecution.

4. (To a very limited extent, because live monitoring was not originally planned) The cameras could be used to identify precursor activity or crimes in progress before they were reported to expedited response.

These hypotheses were translated to articulated project goals, which could then be tested through data monitoring, experience, and evaluation. These goals were:

Goal #1: Deter criminal behavior

Some studies have suggested that surveillance cameras only deter certain types of crimes, such as property crimes and larceny[xix]; others suggest only minimal reductions within the area immediately visible by the camera; while others suggest that cameras merely displace crime into other unmonitored areas or even increase crimes, as the cameras themselves become targets of vandalism.[xx] The *SCI Project* did coincide with a decline in reported crime generally, and in the area specifically. Anecdotally, this included a reduction in serious crime in the target area.

Goal #2: Increase investigation of unreported crime

Crime often goes unreported unless it is extremely violent or results in significant loss of or damage to property. In a small college town neighborhood prone to wild behavior, perceptions of what should be reported can become skewed. For example, in the early morning hours of September 13, 2007, a woman was sexually assaulted while she slept in a sorority. The investigation revealed that the suspects had actually broken into several other sororities and a fraternity that night, and had been "caught" and kicked out by the residents; however, no one contacted the police regarding the burglaries. Interviews with victims of the burglaries indicated that the behavior of the suspects "wasn't weird enough to warrant a call to the cops"[xxi]. Often, when officers responded to the report of an assault victim at the hospital, no one had called the Department to report that the assault had occurred; instead, friends simply drive the victim

directly to the hospital, often with no intent of notifying the police at all. When asked about the difficulty the Department had in identifying suspects in a series of brutal fights between rival fraternities in late October 2007, City of Pullman Attorney Laura McAloon noted "the problem with recent assaults is that nobody would cooperate. They had this code of silence where they wouldn't cooperate with police because it was another fraternity"[xxii] . The *SCI* cameras did regularly capture criminal conduct, both reported and unreported, and allowed officers to initiate or enhance investigations. Additionally, reports made by the student observers from the WSU intern program allowed the police to intervene early in situations involving behaviors that might have lead to serious crimes or posed a safety risk.

Goal #3: Increase police case clearance rate

This project confirmed the effectiveness of surveillance cameras as an investigative and evidentiary aid to law enforcement[xxiii], particularly in a college environment where witnesses are frequently fellow students who are reluctant to cooperate. The *SCI* cameras captured a number of crimes on video and also facilitated investigations, witness and suspect identification and exclusion, testimony validation, and the efficiency of prosecution and law enforcement.

The placement of the cameras was a critical precondition to addressing these goals, and the locations were calculated to cover the most active locations based on reported crimes, calls for service, and interviews of those familiar with the area. A significant set of technical issues had to be addressed, including how to locate or install the cameras to ensure best coverage of public areas while still addressing appropriate privacy concerns of local residents, how the cameras could be remotely controlled, and how to provide access to the camera feed at the Department and on mobile platforms for responders. The project entailed several phases and components, to overcome these logistical issues.

1. The area is in an older part of town and so traditional telecom choices to get the video streams out were limited. The solution involved microwave links at 23Gz to carry the backbone traffic to the city network.
2. The area is filled with foliage-dense old-growth Maple trees, and no local telecom support. The solution was to use 900mz radio links to penetrate foliage from the cameras to the server.
3. The area is also radio-dense with Wireless Access Points on 2.4gz. The solution was to use 4.9Gz Public Safety microwave radios to reach the servers through less-dense areas.
4. Cellular connectivity handoffs caused lost links when viewing the cameras. NetMotion Mobility was purchased and installed to provide a secure, reliable, mobile viewing experience from police cars.

A video server and archive server with associated support hardware were installed in a cabinet, mounted in the 'phone room' at Adams Mall (the room is adjacent to the Police Substation).

Four new poles were installed. Five cameras were installed, linked by radio to antennas on the Adams Mall roof, connecting the cameras to the servers. This supported the original design for police access, and met the needs identified in the grant project design. While still in the installation phase, however, a novel addition to involve student volunteers in camera monitoring was developed. To support this, a SonicWall VPN appliance was installed as an endpoint for a secure connection from a WSU Student Lab to the Adams Mall 23Gz connection for viewing the cameras in real-time, an additional element that is discussed in more detail, below.

Data and Intelligence

Data Collection

Data collection, as originally designed, consisted of three elements: an initial effort which constituted both the establishment of a baseline level of crime, satisfaction with the Department, and perceptions of safety for evaluation and the collection of actionable information to inform the placement of the cameras. This effort involved the generation of calls for service (CFS) data by the Department and the creation of GIS-based crime maps showing the concentration of various types of crime and disorderly behavior in the target and surrounding areas. It also involved interviews of residents, visitors and business representatives in the target area (n = 22), and an initial survey of WSU students to solicit information on perceptions of various topics including crime, personal safety, the Department, and the pending *SCI Project*. The preliminary results of these efforts were used to inform the decisions regarding placement of the cameras, resulting in the selection of the Adams Mall locations. The survey used for this initial effort, as were both subsequent surveys, was administered via e-mail with a link to a web-based questionnaire. A random sample of 2,500 WSU students was drawn from the database of registered students for this survey. A total of 458 responses were received for the first wave of the survey, for a response rate of approximately 22%. Surveying was conducted under appropriate protocols for the protection of human subjects, using a methodology informed by the Dillman Method and consisting of multiple contacts for each non-respondent. The survey questionnaires were administered using "Remark" brand commercial web survey software.

The second phase of data collection occurred in mid-project, after the cameras had been in place for several months. This effort consisted solely of a repeat survey of students at WSU to obtain a second snapshot of perceptions germane to measuring the impact of the camera project. This repetition of the survey contained a panel element, with repeat e-mails to students who had responded to the original survey, and a new random sample. Responses to this iteration were

quite a bit lower (146, for a 12% response rate), but sufficient to provide mid-point information and to support final evaluations.

A final data collection effort conducted just prior to the termination of the grant period replicated the survey element and obtained another set of CFS data from the Department. The research partners also added interviews of officers who made use of the cameras in responses and investigations, student interns who had monitored the cameras (an unplanned addition to the project scope), and the county prosecutor. Because of low response rates to the final survey, an additional convenience sampling process was used to supplement the panel/random e-mail distribution with requests to participate forwarded to students in WSU's Departments of Political Science, Criminal Justice and Criminology, and Communications classes during Spring Semester 2014. Total responses to these two efforts were 107, again much lower than forecast. This may be a reflection of survey fatigue among students, indication that the cameras were no longer a topic of much interest (confirmed anecdotally in officer interviews), or reflective of student detachment in general. While lower than expected as noted above, survey responses were sufficient to allow statistical analyses, as reported below. Monitoring of social media, news, and public forums indicated no dissatisfaction with or criticism of the *SCI Project* or the Department.

Analysis and Evaluation

Primary Variables

Based on the survey data, the research partners examined four primary latent variables which served as both independent and dependent variables: *Satisfaction with Police, Satisfaction with Project, Effectiveness of Cameras,* and *Fear of Crime*. Each latent variable was created by conducting factor analyses (varimax rotation) of a varied number of survey questions which assessed respondents' opinions about subjects related to each of the four factors (i.e., variables)

listed above. For example, the *Satisfaction with Police* latent variable was comprised of six Likert-type scale survey questions regarding how much respondents agreed that the Department was doing a good job of 1) maintaining order, 2) preventing crime, 3) responding in a timely manner, 4) dealing with victims, 5) responding to concerns, and 6) being polite (ranging from 1 = strongly disagrees with each measure to 5 = strongly agrees with each measure). Then, if the factor analysis revealed that survey responses loaded together onto a single component, we concluded that all those questions did in fact measure a single underlying latent factor. In any cases where individual survey responses, did not load on the same component as the majority of the other responses, they were eliminated from the analysis and a new, reduced factor analysis was conducted to verify that the remaining responses all loaded on to a single component.

Once factor analyses revealed only a single component for each of the four factors, the mean value of all the measures for each factor was calculated. These means were what we ultimately used as our primary latent variables in the following analyses. For example, we found that the six questions regarding respondents' satisfaction with the police all loaded together on a single component, so we therefore calculated the mean of all those survey questions to create the variable which we labeled *Satisfaction with Police* ($\alpha = 0.892$).

We then went through the same steps described above to create the three remaining primary latent variables. *Satisfaction with Project* measured respondents' underlying attitudes about the *SCI Project*. This variable was comprised of four Likert-type scale survey questions regarding how much respondents agreed with statements about 1) being comfortable with the amount of input they had during the planning stages of the *SCI Project*, 2) the cameras doing more harm than good (reverse coded), 3) the funding for the project being spent in a better way (reverse coded), and 4) the cameras violating people's privacy (reverse coded) (ranging from 1 =

strongly disagrees with each measure to 5 = strongly agrees with each measure). The mean for all four survey questions was then calculated for each respondent to create the *Satisfaction with Project* variable ($\alpha = 0.867$).

Effectiveness of Cameras measured respondents' underlying opinions regarding whether the safety cameras would have a positive effect on crime (i.e., help reduce crime). This variable was comprised of five Likert-type scale survey questions regarding how much respondents agreed with statements about 1) increasing the number of visits to Adams Mall because of the cameras, 2) the cameras having a deterrent effect on crime, 3) the cameras making them feel safer, 4) the cameras will have no effect on crime (reverse coded), and 5) the cameras increasing successful prosecutions of crime (ranging from 1 = strongly disagrees with each measure to 5 = strongly agrees with each measure). The mean for all five survey questions was then calculated for each respondent to create the *Effectiveness of Cameras* variable ($\alpha = 0.838$).

Finally, *Fear of Crime* measured respondents' underlying fears about crime and victimization. This variable was comprised of three Likert-type scale survey questions regarding how much respondents agreed with statements about 1) feeling safe in general (reverse coded), 2) feeling safe while walking alone during the day (reverse coded), and 3) feeling safe while outside alone at night (reverse coded) (ranging from 1 = strongly disagrees with each measure to 5 = strongly agrees with each measure). Because each of the survey questions were reverse coded, the variable actually measures how *un*safe (i.e., fearful of crime) respondents felt. The mean for all three survey questions was then calculated for each respondent to create the *Fear of Crime* variable ($\alpha = 0.709$).

Control Variables

In addition to the primary latent variables described above, we included a number of respondent-level control variables. Most of our controls were demographic variables measuring age, sex (Male = 1; female = 0), and race/ethnicity (dichotomous variables for *Hispanic*, *Black*, and *Other* race/ethnicity; *White* served as our reference category). In order to account for differences in respondents' opinions based on their experiences in the Adams Mall area, we also controlled for the *Frequency of Visits to Adams Mall* (ranging from 1 = Never to 5 = Very Frequently). Finally, due to the steps we took in order to improve the low response rate during Wave III (discussed in the *Data Collection* section above), we also created a control variable for any respondents who were not randomly selected to participate in the study (i.e., the respondents obtained through our convenience sampling efforts)[xxiv].

In addition to the respondent-level control variables described above, we also included one wave-level control variable: *Crime Rate. Crime Rate* was created independently of the survey and used data from the Department's official statistics on all crimes reported to the FBI's National Incident-Based Reporting System (NIBRS). In addition to the more standard Index I offenses (murder, rape, robbery, aggravated assault, larceny, burglary, motor vehicle theft, and arson), NIBRS also reports crimes such as fraud, destruction of property, and drug offenses. The *Crime Rate* variable was calculated using the Department's total counts of NIBRS offenses for the three month periods preceding each wave of our survey (i.e., October through December, 2012; January through March, 2013; and February through April, 2014) and then dividing that count by Pullman's 2012 and 2013 populations[xxv], and multiplying the result by 10,000 to provide a crime rate per 10,000 population[xxvi]. No other wave-level controls were included in these analyses.

Analytic Strategy

In order to analyze our survey data, we conducted a multi-level modeling (MLM) variation of a pooled time-series analysis[xxvii] that utilizes multiple cross-sections (i.e., waves) of data over time. MLM techniques are appropriate when data is clustered at a macro-level. In this case, our surveys exist at, and are therefore clustered at, two separate levels: the respondent-level (i.e., each respondent's micro-level responses to the survey he or she took, regardless of wave), and the wave-level (i.e., the aggregated macro-level responses of all respondents in each of the three waves of the survey). As a result of this wave-level (i.e., macro-level) clustering, our data violates a basic assumption of standard Ordinary Least Squares (OLS) regression: the independence of error terms. That is, because it is likely that the respondents within a single wave of surveys are more likely to be similar to each other than they are likely to be similar to respondents in another wave of surveys (due to observed and unobserved temporal factors associated with the different time periods in which the surveys were conducted), it would be inappropriate to conduct standard OLS regression analyses.

It is important to note, however, that conducting standard OLS regression analyses would likely not affect the observed relationships between our independent and dependent variables. Rather, it could meaningfully affect our results by providing smaller standard errors and subsequently inaccurate significance tests. By utilizing an MLM analytic strategy, we can correct for this potential dependence amongst error terms by creating different analytic equations for each level of our data (one for the respondent-level and one for the wave-level), each with its own error term. By creating multiple equations and error terms for analysis, any similarity amongst respondents that might be due to unobserved wave-level differences is accounted for in the respondent-level error term. In this way, the respondent-level error terms then become independent from one another, and in so doing corrects for the OLS assumption of independence.

With the violation accounted for, MLM techniques then allows us to conduct standard OLS regression analyses while still generating more accurate results.

One additional benefit of utilizing MLM techniques is that they allowed us to take advantage of all three waves of data at one time while conducting our analyses, even though each wave had a differing number of respondents (some of which may have been too few to conduct a separate analysis of its own). When using MLM techniques, having fewer observations in some clusters (or waves, in this case) than others is not necessarily problematic. This is because MLM techniques allowed us to estimate our results based on all respondents' data, regardless of the wave in which some data was observed. That is, so long as there are enough total observations to estimate our respondent-level variables, lacking a certain number of observations in any one wave, is not a major concern. For this reason, and those discussed above, MLM techniques are ideal for our purposes.

In order to conduct our MLM analyses, we utilized the Mixed Models command in SPSS. We then examined four primary latent variables: *Satisfaction with Police, Satisfaction with Project, Effectiveness of Cameras,* and *Fear of Crime*. Each of the primary latent variables was set as a dependent variable in four separate models and then regressed on the three other primary latent variables, plus all of the controls described in the section above[xxviii]. All independent variables were grand-mean centered for ease of interpretation. Subsequently, the estimates reported in our *Multi-Level Modeling Results* section below should be interpreted as departures from the overall mean levels of each dependent variable. For example, an estimate of -0.123 for the imaginary Independent Variable X should be interpreted as "a one unit increase in Independent Variable X is related to a 0.123 unit decrease from the mean of Dependent Variable Y, net of all controls."

MLM techniques also allowed us to include random error terms for each independent variable included in our analyses. By including random error terms, we would have been able to control whether or not the effect of any given independent variable varied across waves. However, because we had no theoretical reason to expect that the effects of our independent variables should vary from one time period to the next, no random error terms were included at the respondent-level in these analyses. The only random error terms that were included in any of our models were set on the wave-level intercepts. By doing so, the effects of each of the respondent-level independent variables was set as being fixed *within* each wave, but the intercepts (i.e., means) for each wave were allowed to vary *across* time periods because it is likely that the mean levels of each dependent variable would in fact change over time. The intercept estimates of the models presented in the following section should therefore be interpreted as the differences in the mean levels of each dependent variable across each wave of the survey.

Based on the discussion above and the variable descriptions above, the final equations for our analyses are composed as follows[xxix]:

Respondent-Level Equation

$$Y_{ij} = \beta_{0j} + \beta_{1\,\text{Satisfaction with Police}} + \beta_{2\,\text{Satisfaction with Project}} + \beta_{3\,\text{Effectiveness of Cameras}} + \beta_{4\,\text{Fear of Crime}} + \beta_{5\,\text{Frequency of Visits to Adams Mall}} + \beta_{6\,\text{Respondent's Age}} + \beta_{7\,\text{Respondent Male}} + \beta_{8\,\text{Respondent Hispanic}} + \beta_{9\,\text{Respondent Black}} + \beta_{10\,\text{Respondent Other Race}} + \beta_{11\,\text{Respondent Not Random}} + r_{ij},$$

where $_i$ is an index for each respondent surveyed and $_j$ is an index for the three waves of the survey. Y_{ij} represents the each respondent's value on the various dependent variables[xxx] across

each wave. The β_{0i} component symbolizes each respondent's intercept, which signifies the difference in each respondent's value on the various dependent variables when all other elements in the equation equal zero. β_X corresponds to the amount of change from the mean of each dependent variable per one unit increase in some respondent-level variable X (e.g., *Satisfaction with Project, Frequency of Visits to Adams Mall, Respondent's Age*, etc.). The final component in the respondent-level equation, r_{ij}, represents the remaining unexplained variation in each dependent variable for each respondent over time.

When using MLM techniques, the parameters from the respondent-level equation can actually serve as dependent variables for another equation at the wave-level. Thus, each parameter from the equation above could have its own unique, wave-level equation. For the purposes of our analyses, we include only one wave-level control variables, and allow only our respondents' intercepts ($\beta_{0,i}$) to vary randomly:

Wave-Level Equation

$$\beta_{0j} = \gamma_{00} + \gamma_{01\ \text{Crime Rate}} + u_0$$

where the γ component reflects the mean levels of the equivalent respondent-level parameters from the respondent-level equation. The γ_{00} component symbolizes each wave's intercept (for potential higher-level equations), which signifies the difference in each wave's value on the various dependent variables when all other elements in the equation equal zero. γ_{0X} corresponds to the amount of change from the intercept per every one unit increase in some wave-level variable X (in this case, the *Crime Rate* variable). Finally, the u_0 component represents the remaining unexplained wave-level variation in each dependent variable over time.

Survey Results

Univariate Results

Table 1.1 presents the descriptive statistics for all the variables included in our analyses, including the primary latent variables (discussed in more detail below) and the various controls. Beginning first with the respondent-level control variables, 56.3% of our respondents were ages 18-21, 39.9% of respondents were 22-29, and only about 3.4% of respondents were over the age of 30 (ranges from 18-50+). Although such a distribution does not match most nationally

Table 1.1 Descriptive Statistics

	Mean	Std. Dev.	Min.	Max.
Wave-Level Variables (n_j = 3)				
Crime Rate (per 10,000 population)	57.09	19.09	46.50	94.60
Respondent-Level Variables (n_i = 711)				
Satisfaction with Police	3.88	0.87	1	5
Satisfaction with Project	3.17	1.08	1	5
Effectiveness of Cameras	3.16	0.90	1	5
Fear of Crime	1.53	0.65	1	5
Frequency of Visits to Adams Mall	3.12	1.00	1	5
Respondent's Age (Ordinal)	1.81	0.64	1	5
Respondent Male	0.51	0.50	0	1
Respondent White	0.81	0.39	0	1
Respondent Hispanic*	0.04	0.20	0	1
Respondent Black	0.01	0.11	0	1
Respondent Other Race	0.18	0.38	0	1
Respondent Not Random	0.03	0.16	0	1

* Race/Ethnicity variables do not add to 1.00 because respondents could identify as both Hispanic and another race.

representative surveys, it should be expected given our sampling frame of WSU students. In regards to sex, slightly over half of our sample was male (50.7%). For race and ethnicity, WSU

is somewhat unique in that it is located in a small, rural town and therefore shares the racial/ethnic demographic characteristics of most small, rural towns. 81.2% of our respondents were White, 4.0% were of Hispanic descent, and only 1.1% were Black. The remaining 17.7% of respondents were some other race or ethnicity (primarily Asians and Pacific Islanders). When asked about their experiences in Adams Mall, the average respondent reported visiting the area only occasionally. Finally, only 19 respondents to Wave III of the survey were selected using our convenience sampling method (i.e., non-randomly), accounting for only 2.7% of the total sample size. For the wave-level control variable, the crime rate at Wave I was 47.60 per 10,000 population, 94.60 at Wave II, and 46.50 at Wave III, with a mean 57.09 crimes per 10,000 population over the course of the project period (standard deviation = 19.09).

For the four primary latent variables, it is more informative to discuss our univariate results using figures in addition to Table 1.1. As Figure 1.1 shows, the mean level of satisfaction with the police increased across the three waves of surveys. Specifically, at Wave I, the mean value of the latent variable *Satisfaction with Police* was 3.84 out of 5 (where 1 = completely dissatisfied, 3 = neutral, and 5 = completely satisfied). In other words, at the beginning of the project, the average person was already somewhat satisfied with the police. Over time, satisfaction with police increased: at first only slightly (Wave II = 3.85), but then by a relatively large amount later (Wave III = 4.10), such that the average person was very satisfied with the police at the end of the project.

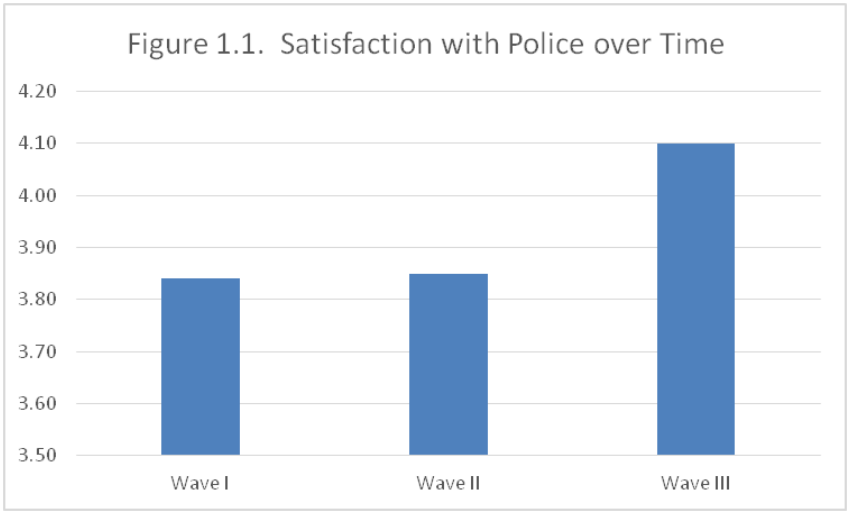


Figure 1.2 displays the mean levels of satisfaction with the *SCI Project* over the course of the grant period. Here again, we see an increase in respondents' perceptions over time, but this time we see a gradual change from being slightly dissatisfied with the project to being more satisfied. Specifically, at Wave I, respondents reported a mean value of 2.99 out of 5 on the latent variable *Satisfaction with Project* (where 1 = completely dissatisfied, 3 = neutral, and 5 = completely satisfied). In other words, during the first wave of our surveys, the average person had a very slightly negative attitude toward the SCI Project. This result reversed itself, however, over the next two survey periods – at Wave II, respondents reported above average satisfaction with the project (3.45) and even greater satisfaction in the final wave (Wave III = 3.51).

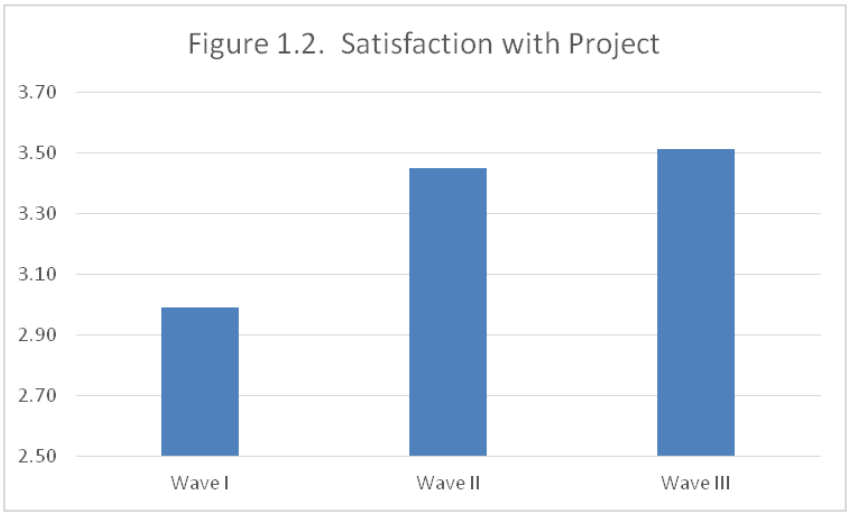
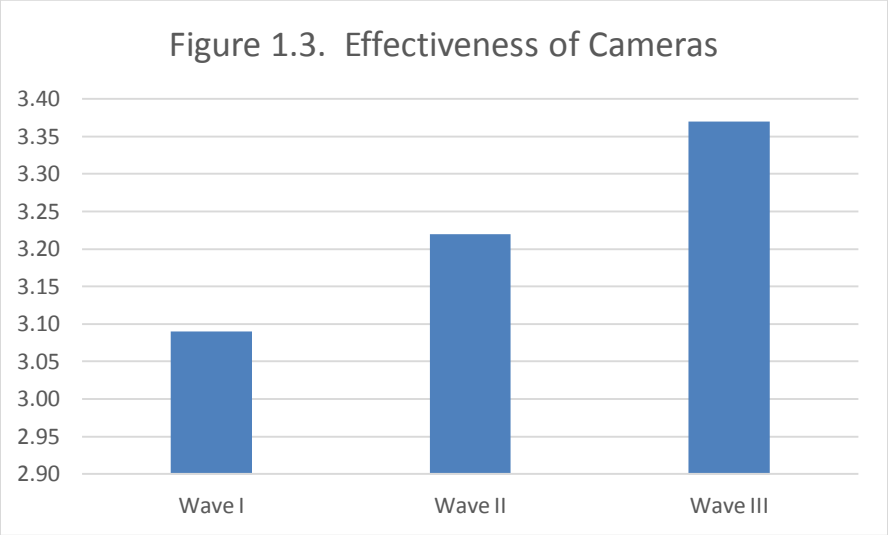
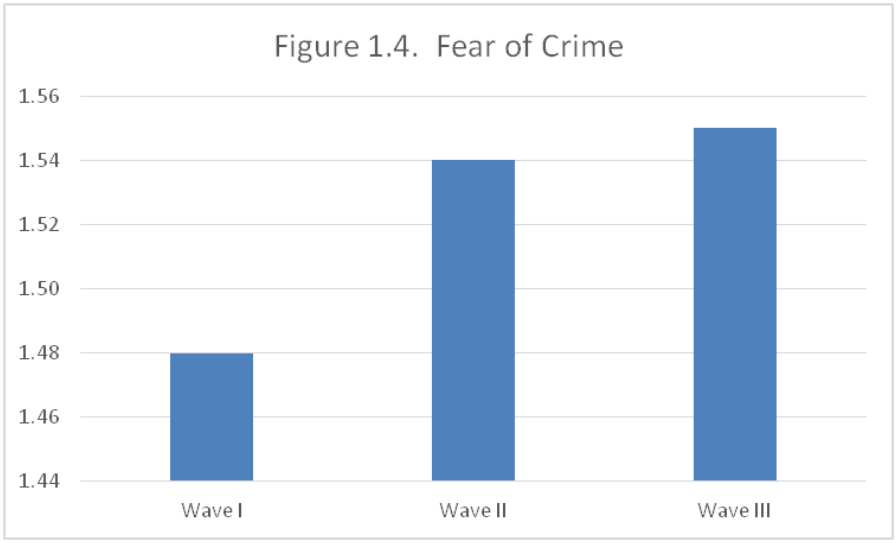


Figure 1.3 shows respondents' mean levels of confidence in the cameras having a positive effect on crime. As the figure indicates, respondents' confidence in the cameras started at a level that was only slightly above neutral (3.09 out of 5) on the latent variable *Effectiveness of Cameras* (where 1 = complete lack of confidence, 3 = neutral, and 5 = complete confidence), but steadily increased over time (Wave II = 3.22 and Wave III = 3.37). These results suggest that respondents consistently felt positive about the benefits the cameras could have on crime, although they were never too confident about them.



Finally, Figure 1.4 presents respondents' mean levels of the latent variable *Fear of Crime*. Contrary to our expectations, we observed an increase in fear of crime over the course of the project. While we had expected that the cameras should alleviate people's concerns about crime and victimization, instead, we found that fear of crime increased from a below average level (i.e., not being fearful of crime) at Wave I (2.83 out of 5, where 1 = completely afraid, 3 = neutral, and 5 = completely unafraid) to being slightly afraid at Wave II (3.07) and even more afraid at Wave III (3.21). Although these results contradicted our initial



expectations at the time of our grant proposal, it may be the result of some of the historical events that occurred during the project period. For example, during the period of time between when we sent out the first wave of our survey (January 2013) and when we received our final wave of surveys (August 2014), there were a number of mass shootings and school shootings, as well as the subsequent and nearly continuous local and national media coverage, that helped feed many Americans' worries and concerns about such criminal incidents. Additionally, during the project period, the WSU & Pullman communities experienced the near fatal assault on WSU Professor David Warner which also garnered much local media attention. Thus, even though it ran contrary to our initial expectations, an increase in respondents' fear of crime could in fact be expected during a period of time when mass and school shootings were leading daily headlines and when a serious assault occurred on campus.

Multi-Level Modeling Results

Table 1.2 presents the findings for all four models analyzed for this part of our study, including both respondent-level and wave-level independent variable estimates and

Table 1.2. Multi-Level Analyses of Satisfaction with Police, Satisfaction with SCI Project, Effectiveness of Cameras, & Fear of Crime

Dependent Variable	Model 1 Satisfaction with Police		Model 2 Satisfaction with Project		Model 3 Effectiveness of Cameras		Model 4 Fear of Crime	
Respondent-Level Variables	**Coefficient**	**SE**	**Coefficient**	**SE**	**Coefficient**	**SE**	**Coefficient**	**SE**
Intercept	3.90 **	(0.06)	3.30 ***	(0.13)	3.11 ***	(0.05)	1.52 ***	(0.03)
Satisfaction with Police	-	-	0.12 **	(0.04)	0.14 ***	(0.03)	-0.18 ***	(0.03)
Satisfaction with Project	0.14 **	(0.05)	-	-	0.56 ***	(0.02)	-0.08 *	(0.03)
Effectiveness of Cameras	0.26 ***	(0.06)	0.86 ***	(0.04)	-	-	0.22 ***	(0.04)
Fear of Crime	-0.34 ***	(0.06)	-0.12 *	(0.05)	0.22 ***	(0.04)	-	-
Frequency of Visits to Adams Mall	-0.12 ***	(0.03)	0.08 *	(0.03)	-0.05 †	(0.03)	-0.06 *	(0.03)
Respondent's Age	0.00	(0.01)	0.01	(0.01)	-0.01	(0.01)	0.01	(0.01)
Respondent Male	-0.20 **	(0.07)	-0.03	(0.06)	-0.07	(0.05)	-0.31 ***	(0.05)
Respondent Hispanic	0.21	(0.19)	0.15	(0.17)	-0.10	(0.14)	0.30 *	(0.14)
Respondent Black	-0.19	(0.32)	0.33	(0.29)	-0.34	(0.23)	0.16	(0.24)
Respondent Other Race	-0.03	(0.10)	-0.18 *	(0.09)	0.15 *	(0.07)	0.05	(0.07)
Wave-Level Variables								
Crime Rate (per 10,000 population)	-0.02	(0.03)	0.06	(0.04)	-0.02	(0.02)	-0.01	(0.01)
Model Fit Statistics								
Chi-Square	465.60***		811.80***		831.65***		376.52***	
Respondent-Level Pseudo R-Square	0.212		0.606		0.558		0.230	
Wave-Level Pseudo R-Square	0.534		0.718		0.477		0.510	

NOTE: † $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.01$

two sets of model fit statistics (Chi-Square and pseudo r-squares[xxxi]). Model 1 in Table 1.2 displays the estimates for *Satisfaction with Police* as the dependent variable, Model 2 displays the estimates for *Satisfaction with Project* as the dependent variable, Model 3 displays the estimates for *Effectiveness of Cameras* as the dependent variable, and Model 4 displays the estimates for *Fear of Crime* as the dependent variable.

As Model 1 shows, each of the three other primary latent variables were strong and significant predictors of respondents' *Satisfaction with Police*. *Fear of Crime* was the strongest predictor, such that a one unit increase in a respondent's fear was associated with a 0.34 unit downward departure from the mean level of satisfaction, net of the other controls ($p < .001$). In other words, as one might expect, the more afraid of crime that people are, the less satisfied with the police they tend to be. *Satisfaction with Project* was a significant, positive predictor of *Satisfaction with Police* (0.14; $p < 0.01$), as was *Effectiveness of Cameras* (0.026; $p < 0.001$). The only other significant predictors of *Satisfaction with Police* were *Frequency of Visits to Adams Mall* (those who visited more often were less satisfied; $p < 0.001$) and *Male* (males were less satisfied with the police than females; $p < 0.01$). Somewhat surprisingly, the wave-level *Crime Rate* variable was not a significant predictor of *Satisfaction with Police*, although research has found that for many outcomes, it is actually individuals' perceptions of crime that tend to be more important than actual levels of crime[xxxii]. The model fit statistics for Model 1 show that this final model was a significantly good fit ($\chi^2 = 465.60$; $p < 0.001$) and explained 21.2% of the variance at the respondent level and 53.4% of the variance at the wave-level.

In Model 2, we see that the three other primary latent variables are once again strong, significant predictors of *Satisfaction with Project* this time. Not surprisingly, respondents' opinions regarding the *Effectiveness of Cameras* were the strongest predictor of satisfaction.

Here, a one unit increase in *Effectiveness of Cameras* was related to a 0.86 unit downward departure from meal level of *Satisfaction with Project*, net of the other controls ($p < .001$). Intuitively, this makes sense, as those who thought the cameras could help reduce crime would likely have greater satisfaction with the *SCI Project*. *Satisfaction with Police* was also positively and significantly related to *Satisfaction with Project* (0.12; $p < 0.01$), while *Fear of Crime* was negatively and significantly related (-0.12; $p < 0.05$). In addition to the primary latent variables, *Frequency of Visits to Adams Mall* positively and significantly predicted individuals' satisfaction (0.08; $p < 0.05$), while we found that respondents of other races were significantly less satisfied with the *SCI Project* (-0.18; $p < 0.05$). The model fit statistics for Model 1 show that this final model was a significantly good fit ($\chi^2 = 811.80$; $p < 0.001$) and explained 60.6% of the variance at the respondent level and 71.8% of the variance at the wave-level. While these pseudo r-square estimates are relatively high, they are not surprising given how important the *Effectiveness of Cameras* measure was in Model 2.

Model 3 displays the estimates for *Effectiveness of Cameras* as the dependent variable. Once again, all three other primary latent variables were significant predictors. As one might expect based on the findings described for Model 2, the best predictor of *Effectiveness of Cameras* was *Satisfaction with Project*. A one unit increase in satisfaction was associated with a 0.56 unit upward departure from the mean level of each respondent's beliefs that the cameras could reduce crime, net of the other controls ($p < 0.001$). In other words, if a respondent was happy with what the *SCI Project* was all about, he or she was also had above average confidence in the cameras' ability to reduce crime. *Satisfaction with Police* (0.014; $p < 0.001$) and *Fear of Crime* (0.22; $p < 0.001$) were also positively and significantly related to the dependent variable. This latter result suggests that respondents who were afraid of crime also had greater confidence

in the cameras, perhaps hoping that the cameras could alleviate some of their fears. Of the control variables in the model, *Frequency of Visits to Adams Mall* was negatively related to perceptions of effectiveness, but only at a more liberal significance level (-0.05; $p < 0.10$), while respondents of other races had greater confidence in the cameras' ability to reduce crime (0.15; $p < 0.05$). The model fit statistics for Model 3 show that this final model was a significantly good fit ($\chi^2 = 831.65$; $p < 0.001$) and explained 55.8% of the variance at the respondent level and 47.7% of the variance at the wave-level.

Finally, we see the estimates for *Fear of Crime* as the dependent variable in Model 4. Like the previous models, the three other primary latent variables were here again significant predictors of respondents' fear, although this time, it was a control variable, *Male*, which was the strongest predictor. As observed in a very wide body of research[xxxiii], we also found that male respondents had significantly below average fear of crime as compared to females (-0.31; $p < 0.001$). Another large effect was observed for respondents of *Hispanic* descent, such that *Hispanic* respondents were more afraid of crime than *Whites* (0.30; $p < 0.05$). This may be due to the fact that *Hispanics* make up such a small portion of the Pullman area population, but, as other research shows, also tend to be victims of violence more often. This does not explain, however, why *Black* respondents, or those of *Other* races were not significantly more afraid of crime than *Whites*. Of the primary latent variables, *Satisfaction with Police* (-0.18; $p < 0.001$) and *Satisfaction with Project* (-0.08; $p < 0.05$) were both negatively and significantly related to fear. As observed in Model 3, on the other hand, *Effectiveness of Cameras* again had a positive, significant relationship with fear (0.22; $p < 0.001$). This finding suggests, however, that as confidence in the cameras increases, so too does respondents' fear – which is contradictory to the implications of the Fear-Effectiveness finding described for Model 3 above. Thus, it appears that

the relationship between *Effectiveness of Cameras* & *Fear of Crime* may be more complicated can be understood from our data[xxxiv]. The model fit statistics for Model 1 show that this final model was a significantly good fit ($\chi^2 = 376.52$; $p < 0.001$) and explained 23.0% of the variance at the respondent level and 51.0% of the variance at the wave-level.

Throughout all four models, three control variables stood as having no significant relationship with any of the dependent variables in each analysis. *Respondent's Age*, *Respondent Black*, and the wave-level control variable *Crime Rate* were all non-significant predictors of each dependent variable. Although the lack of relationship between these variables and the four primary latent variables might be surprising in most studies, in our study of the *SCI Project*, they may be easily explained. In the case of each control variables, the Pullman and WSU areas tend to have very little variation when it comes to those measures. Pullman, as a city, and WSU, as a university, have Black populations far below national averages, therefore a simple lack of variation may explain the non-significant findings in our study. In regards to the lack of effects for age, a lack of variation may once again explain such findings. Although the city of Pullman certainly has a broader range of ages for its residents, our survey specifically targeted only WSU students who, like most college students, tend to only range in age from around 18 to 22 years. Finally, because Pullman and WSU experience relatively low levels of crime, and because there was little variation in those levels across waves, it is not surprising that we did not observe any significant effect of each wave's crime rate. Additionally, as was briefly discussed above, recall that individuals' perceptions of crime are often more important than actual levels of crimes, so because we control for (or attempt to explain) respondents' fear of crime in each model, any explanatory power that the true crime rates may have had on the various outcomes could have been moderated by our measure of fear.

Integration and Sustainability

Integration and sustainability for new technologies in police agencies are strongly influenced by agency culture and officer acceptance, both of which hinge on perceived utility. Although not contemplated by the original design proposed for this project, the opportunity arose to speak with Department officers and the Whitman County Prosecutor regarding their experiences with and perceptions of the *SCI Project* cameras. These interviews confirmed our own observations that the camera system had been accepted and incorporated into daily routines and would remain viable beyond the grant period. Overall, the individual experiences reported were categorized as primarily favorable, and the camera system (and this project) was seen as a positive element in enhancing public safety and addressing crime in the target area. Every person interviewed opined that the cameras were a valuable resource, and one that they had personally made use of during the project. Many also reported having heard mostly positive comments about the cameras from the public, and several reflected on their belief that the cameras had helped influence a reduction in crime and disorder in the area. Some frustrations were aired, however, with the location and operation of the cameras, and the heightened expectations created by the implementation of the camera project regarding the ability to identify and solve crimes.

The prosecutor's office had limited exposure to the camera project, with only two significant cases reported. Both of those were categorized by the office as having benefitted significantly from the information provided by the camera system. One, the David Warner assault case, actually ended in a declined prosecution, but the office expressed strong appreciation for the role played by the cameras in identification of the individuals involved, clarification of the chain of events, and the ultimate decision to decline what they said would have been at best a marginal, expensive, and controversial prosecution. The use of the cameras to

efficiently exclude suspects and refocus investigation was mentioned by several officers, as well. The second case involved a drive-by assault (with a blowgun) and ended in a successful prosecution after identification of the perpetrators based in part on the availability of camera footage. In general, the prosecutors were highly in favor of the camera system and the *SCI Project* and look forward to making continued use of that capacity in the future.

Within the Department, interviews were conducted with five officers, one shift sergeant, and a detective. All had at least some personal experience with the cameras, primarily retrospective examination of archived footage, but also involving some "live" hands-on use of the system for each of them. The detective and sergeant had slightly different perspectives than the officers, but overall opinions and experiences were positive, with the camera system seen as being both useful and beneficial. Many, in fact, expressed a frustration that there were not more cameras, and suggested additional locations and improvements in operating protocol. Several key observations can be identified from these interviews:

- Limited and occasional usage prevented development of a strong officer capability with the controls and posed a repetitive challenge to relearn how to effectively use the system to best advantage.
- The cameras did not always meet officer expectations, and sometimes did not provide important information because of the way they were positioned or controlled. We heard several times that cameras had "just missed" a critical event because they were pointed in the wrong direction, or that a student intern operator had inadvertently zoomed in too far to provide a useful overview of a developing situation.
- Every officer recalled at least one positive experience with the cameras, whether documenting criminal activity, as an aid in suspect elimination or identification to

enhance investigation, or as an aid in developing a clear picture/timeline of events and validating witness recollections.

- The officers were cognizant of the cost/benefit element of installing more cameras, especially in a period of falling crime rates, but would like to see more cameras installed in the area covered by this project and elsewhere.
- The officers had suggestions for refinements to the location and operation of the cameras, which included maintaining stationary focus on specific areas which have been identified as particularly ripe with observation opportunities, the enhancement of training for student interns operating the system (discussed elsewhere), and additional locations.
- The cameras have been used for all purposes originally identified in the proposal for this project: documentation of activity for evidentiary and investigatory purposes, identification and/or exclusions of suspects in investigations, assessment of developing situations to inform possible early intervention, and assessment of reported situations to inform response.
- The cameras were also seen as having had a deterrent effect, and having reduced the incidence of serious crime. As the detective reported during his interview, "I am being called to investigate fewer serious crimes in that area since the cameras went in."
- The *SCI Project* and the news reports about the cameras (e.g. the Warner case) have created heightened expectations among both citizens and officers that the current camera system is sometimes unable to meet. Frustration with not having a camera view of an event, a camera malfunction, or the absence of a camera which might observe an area or event were all identified as issues to be addressed.

In all, the opinions and experiences described by the prosecutor and officers reflected a primarily positive assessment of the *SCI Project*, an appreciation for the capacity and impact on public safety represented by the cameras, and a belief that the cameras were, and will continue to be, a strong component of an effective reduction in crime and disorder in the target area.

In terms of continuing collaboration, this grant has fostered strong relationships and a number of unanticipated benefits which will survive long past the expiration of the grant period. The ability to leverage the camera project for additional purposes is one example. In early summer 2012, a research meeting between the Division of Governmental Studies and Services (DGSS), Department of Criminal Justice and Criminology, and Department opened dialogue on research opportunities and community partnerships bridging the practitioner and academic divide. Building on the relationships built during this grant project, this meeting continued the shift away from the unidirectional practice of outreach to explore additional mutual collaborations with the potential for improving public safety in the local community. Over the course of the meeting, several intriguing opportunities were identified. One opportunity which translated into action was a feasibility assessment for using WSU student volunteers as camera operators on the system. Because of the budgetary limits of this project, scheduled live camera monitoring had been identified but rejected as beyond the scope. Instead, the original project plan was that monitoring of camera feeds would occur only on an as-needed basis, or in connection with specific events, as time allowed, by agency staff. The research partners proposed testing a student-engaged project to monitor camera feeds during peak calls-for-service periods.

The pilot test began as class projects for junior and senior level undergraduate students enrolled in two upper-division Criminal Justice and Criminology courses. The topic areas of these courses aligned seamlessly with the *SCI Project*. Secure access to the camera system was

extended to computers in an on-campus secure data lab operated by DGSS. Those computers were dedicated to this project, with additional password security in addition to the lab's physical security protections. Student volunteer interns were required to complete a background check, sign a confidentiality agreement, complete a two-hour training session with emergency dispatch, as well as complete a one-hour training session on policy and camera operation

This first camera monitoring effort commenced during Fall 2012 semester with testing of the logistics for vetting and subsequently training over fifty camera operators. Initially, there were some challenges with missing information on background check forms and limits on the number of people capable of being in the emergency dispatch center; for safety reasons, only two additional people were authorized on the floor at any given time, requiring the creation of twenty-five separate sessions. Given the sensitive nature of the program, refining these accountability mechanisms was critical to the success of the program and acceptance by the community. Initially, there was some community resistance to the *SCI Project*, typified by this excerpt from a participant's reaction statement.

> *This program has not always received positive press but it made me think that I was making a difference. People tend to not want the police to be involved in their disputes when having a night out though we were able to stop things from getting out of hand. My viewpoint on this matter is that we were acting as a safety blanket of sorts. We used our decision making to try to decipher what was happening and were ready to report if anything became a problem.*

Due to contract and equipment delays, there was no actual monitoring of *SCI Project* camera footage during this first attempt to utilize WSU student volunteers. However, important logistical

issues were identified and resolved during this time, and many of the students expressed the desire to volunteer for the project during the next semester.

For the Spring 2013 semester, the volunteer student camera monitors were drawn from a crime prevention course taught by Dr. Makin. Logistical refinements developed during the fall led to a streamlined administrative process, including completion of the necessary *SCI Project* paperwork as well as coordinating predetermined times over a two-week period for students to complete their training at the emergency dispatch center. These refinements proved particularly beneficial as nearly seventy students participated in the camera monitoring project during the 2013 spring semester. The success of the program established the foundation for a long-term project and the creation the Public Safety Camera Operator Internship program at WSU.

Officially implemented in Fall 2013, the Public Safety Camera Operator Internship consists of training and 120-hours of monitoring over the course of a semester. Upon completion of the internship requirements, students receive three academic credits. Recognizing the logistic challenges of managing large participant involvement, the internship was limited in size to no more than fifteen selected interns each semester from a much larger applicant pool. Operator shifts began on Wednesdays and continued through Saturdays (including Sundays when deemed necessary). Each shift averaged approximately five hours spanning from 10:00pm to 2:30am. During specific periods, we adjusted shift times to 6.5-hours with shifts starting at 8:00pm. Examples of these specific periods included the first few weeks of the academic semester, the first home football game, homecoming, and the Apple Cup (the annual game between the University of Washington and Washington State University). For safety reasons, and to minimize operator fatigue, we assigned no less than two interns per shift. The following excerpt from an intern details a typical shift.

> *Typically, there are around five interns per night, which allows us to each be able to take at least one break to rest our eyes, drink/eat something. This allows us to get a different perspective on things, having to stare at computer monitors for five hours could cause a person to become tired causing their attention to decrease and potentially miss important details.*

This program has been a resounding success. The internship program has provided a valuable public safety service to the City of Pullman, allowing scheduled monitoring of the cameras that would have been otherwise impossible. Over the course of this project, camera operators have reported a range of public safety and crime issues to the emergency dispatch center and to the Department, including such recurring observed crimes as assaults and public intoxication, as well as other situations requiring medical intervention. The observation and notifications provided by the interns have enhanced response through both independent notification of events and logging of video evidence through active camera control, benefits confirmed by officer interviews. Including the most recent cohort of interns selected for Fall 2014, close to one hundred students have participated in the volunteer camera monitoring program. In addition to providing a valuable public safety service, students obtained valuable skills making them more employable, as displayed in the following excerpt.

> *Overall, I think the camera internship was a worthwhile experience that gave me some important skills and experiences for any future career in law enforcement. Maintaining long, often boring shifts late into the night is a part of being a police officer, and gaining experience in performing these kinds of shifts is great practice. In addition, being able to scan large areas and large crowds for potential danger is a valuable skill in policing, and watching the security cameras was great practice for this as well. All of these*

learning experiences were very beneficial to me and I am glad that I participated in this internship.

This student engagement will continue well beyond the expiration of the grant period, with WSU students serving as a force multiplier for the Pullman Police Department, providing between $7,000 and $12,000 in volunteer effort each semester to enhance public safety while learning essential skills and improving their own ability to successfully compete for public safety jobs.

Summary and Conclusions

The sections above describe in both quantitative and qualitative terms the positive effects that the *SCI Project* has had on the City of Pullman, and more specifically, the Adams Mall area near the WSU campus. The project has also fueled a strong and durable collaborative relationship between the Department and the University. Furthermore, the cameras have provided many benefits well beyond what can be demonstrated statistically for the Department.

Within two months of camera installation, the *SCI Project* cameras captured an altercation in the target area that resulted in WSU faculty member David Warner sustaining a serious brain injury. Volunteer students monitoring the camera feeds made the first report to 911, initiating the response of police and medical personnel[xxxv]. Four suspects involved fled the area before police arrived, and attempts to identify them through traditional investigative methods were initially unsuccessful. As has been the case many times in Pullman, bystanders were either uncooperative or unreliable witnesses.

However, because of the grant funded *SCI Project*, police officers did have one extremely reliable witness: a substantial portion of the altercation was captured on video. The Department provided both video stills and full video clips to the press in an attempt to identify

all of the involved parties, as well as potential witnesses. The Warner case received heightened media attention throughout the State of Washington and beyond. As a result of the press coverage that included the video, a tip was provided that led to the identity and eventual arrest of the four involved suspects. While the identity of the involved parties was no longer in question, related interviews resulted in questions surrounding the identity of the aggressor, as well as the actual circumstances of the assault. However, the video footage clearly identified the aggressor and the events that took place. Aided heavily by the *SPI Project* camera footage, the Whitman County Prosecuting Attorney was able to make final charging determinations that could not have occurred without the video footage.

As a result of the successes of this high profile case, the value of the grant funded *SCI Project* was justified to the entire community, as well as countering any lingering privacy concerns. Additionally, Department staff quickly learned to manage the video more effectively with the press. The Department also expanded its use of social media outlets, adding a You Tube channel to post videos and enhancing the use of their Facebook and Twitter accounts. The social media following of the Department increased significantly.

Another benefit of the *SCI Project*, albeit an unexpected one, was the new relationship it created between the Department and WSU Criminal Justice Professor David Makin's Technology & Criminal Justice course. While it had never been the project teams' intent from the outset to assign police department staff to exclusively monitor the live camera feed, we understood how having someone monitor those feeds, especially during peak activity times, could be a boon to the cameras' utility. Before Dr. Makin's involvement, the camera footage might only be viewed after a crime was reported. Although police staff could view the live feed when an incident was reported in that area or otherwise as time allowed, particularly during peak

activity times, the Department simply did not have the resources to devote an employee to monitoring the camera feeds full-time. Fortunately, a member of the public suggested utilizing volunteers to monitor the live camera feeds during one of the public forums, and Dr. Makin turned that suggestion into a reality. The program was so successful that it was institutionalized by WSU as an official internship program. Participants in the Public Safety Camera Operator Internship continue to monitor the cameras to this day, and will continue for the foreseeable future. This was an innovative expansion of service learning and student civic engagement, as well as drastically increasing the awareness of the general student population of the public safety project. The program also acts as a successful force multiplier for the Department.

Beyond the effects of the cameras, the *SCI Project* also further strengthened the relationship between WSU and the Department. WSU is a prominent presence in Pullman. Consequently, a good working relationship had been developed over time between the Department and various entities at the University. These include the University police department, athletics, student government, fraternities and sororities, etc. WSU is a research university and includes a robust criminal justice program. Yet, the criminal justice relationships that could potentially lead to mutually beneficial resources had not been created. This was due in part to a lack of any urgency or necessity to create those relationships. Other barriers existed as well, such as a historical distrust of academia by law enforcement. From the perspective of many law enforcement officers, academics are often seen as those who critique and criticize their efforts without the benefit of real life police officer experience. The grant requirement to enlist a local research partner from the accredited criminal justice or social science educational community set the stage to initiate a mutually beneficial relationship and one that went beyond simply congenial. During the initial phases of the grant, our WSU research partners began to

build credibility, not only with the Pullman Department grant administrators, but also with line level officers. WSU researchers provided quantified information to determine the most appropriate location to place the cameras, which was consistent with what line level officers instinctively knew.

Within a few months of the grant funded cameras going live, the police department also implemented the use of body-worn cameras by patrol officers (a completely separate project from the grant funded cameras). Dr. Makin, who had previously conducted body-worn camera research, was interested in studying internal policy development and implementation of the body-worn cameras. Officers were already aware of the WSU research partnership with the grant funded cameras and the project's success. Some credibility had already been established with the WSU researchers, and police management was also demonstrating a cooperative partnership with the WSU researchers. We firmly believe that this positively influenced the line level officers to ultimately agree to voluntarily participate in the body-worn camera research.

Furthermore, the initial phases of the grant coincided with an effort to develop a joint Comprehensive Emergency Management Plan (CEMP) between the City of Pullman, Whitman County, and WSU. It was also simultaneous with WSU's efforts to invigorate their emergency management capabilities. It just so happened that one of the research partners involved in the grant also serves as WSU's emergency management director, and that the City of Pullman's Police Chief also serves as the City's emergency management coordinator. A close working relationship between the emergency managers from the two entities was enhanced through the partnership created by the grant. This positive, mutually beneficial relationship has definitely reaped rewards well beyond the grant work. Significant progress has been made toward a joint

CEMP and potential barriers during that process were quickly mitigated, due in large part to the positive relationship developed through the grant.

Other examples of the strong working relationship between the WSU research partners and the Department include joint efforts at presenting the scope and nature of the research project at national conferences. In 2013, the entire grant project team attended the Academy of Criminal Justice Science (ACJS) conference in lieu of the Smart Policing Initiative grant conference. The team made a presentation at the ACJS conference about the unintended benefits derived as a result of working together on the grant. If not for the relationship with the WSU research partners, the Department members of the grant project team would likely not have attended this academic conference otherwise. However, the Department grant project members were so impressed with the wealth of resources available through ACJS for law enforcement practitioners, that Chief Jenkins has since become an ACJS member and plans to be actively engaged in seeking well researched best practices from the Academy and then bringing those practices to the Pullman & WSU communities

The Smart Policing Initiative grant has provided direct benefits to the Pullman & WSU communities with enhanced public safety through security cameras in an area with a high frequency of public disorder. However, the tangential, indirect, and unintended benefits of the grant have been truly remarkable and will serve to enhance public safety and the quality of life in Pullman for many years to come.

[i] Vestal, Shawn. "Fighting, assaults in Pullman on the rise". *The Spokesman-Review*. February 25, 2008. www.spokesmanreview.com/tools/story_breakingnews_pf.asp?ID=13808

[ii] Pullman City Code, Chapter 5.05 (Ord. 07-3 §17, 2007). http://www.pullman-wa.gov/DrawOnePage.aspx?PageID=29

[iii] Pullman City Code, Chapter 5.55 (Ord. 07-18 §2, 2007). http://www.pullman-wa.gov/DrawOnePage.aspx?PageID=29

[iv] Pullman City Code, Chapter 8.26 (Ord. 08-6 §2, 2008). http://www.pullman-wa.gov/DrawOnePage.aspx?PageID=41

[v] Census 2010: Washington: Pullman. http://data.spokesman.com/census/2010/washington/cities/pullman-wa/

[vi] Pullman, Washington. Wikipedia. http://en.wikipedia.org/wiki/Pullman,_Washington

[vii] Mills, Joel. "WSU ranks among best of nation's party schools". *The Lewiston Tribune*. April 25, 2009. http://media.spokesman.com/documents/2009/04/Document1_____.pdf

[viii] Pullman City Code, Chapter 5.05 (Ord. 07-3 §17, 2007). http://www.pullman-wa.gov/DrawOnePage.aspx?PageID=29

[ix] Pullman City Code, Chapter 5.55 (Ord. 07-18 §2, 2007). http://www.pullman-wa.gov/DrawOnePage.aspx?PageID=29

[x] Pullman City Code, Chapter 8.26 (Ord. 08-6 §2, 2008). http://www.pullman-wa.gov/DrawOnePage.aspx?PageID=41

[xi] Vestal, Shawn. "Fighting, assaults in Pullman on the rise". *The Spokesman-Review*. February 25, 2008. www.spokesmanreview.com/tools/story_breakingnews_pf.asp?ID=13808

[xii] Gibb, Abbey. "Drunk, awake and rowdy: Pullman cops worried about WSU students". KREM.com. February 12, 2010. http://www.krem.com/video/featured-videos/Drunk-awake-and-rowdy-Pullman-cops-worried-about-WSU-students-84276487.html

[xiii]Revised Code of Washington 46.61.502. http://apps.leg.wa.gov/RCW/default.aspx?cite=46.61.502

[xiv] Vestal, Shawn. "Fighting, assaults in Pullman on the rise". *The Spokesman-Review*. February 25, 2008. www.spokesmanreview.com/tools/story_breakingnews_pf.asp?ID=13808

[xv] http://www.pullman-wa.gov/departments/police/information-for-citizens/safety-camera-initiative

[xvi] "Camera concerns addressed." *The Daily Evergreen*. February 16, 2012. http://archive.dailyevergreen.wsu.edu/public/readmore.castle?id=1932

[xvii] Spencer, Elysia. "Pullman Police Department's Safety Camera Initiative (SCI) Project / Public Forum on March 21, 2012 / Questions and Answers". City of Pullman Police Department. March 21, 2012. Page 6, Question 18. http://www.pullman-wa.gov/departments/police/information-for-citizens/safety-camera-initiative/sci-public-forumssurveys

[xviii] "Chief promotes transparency". *The Daily Evergreen*. December 12, 2011. http://archive.dailyevergreen.wsu.edu/read/Chief-promotes-transparency

[xix] Buntin, John. "Long Lens of the Law". Governing. May 2009. Pages 24-30.

[xx] King, Jennifer, et al. "Preliminary Findings of the Statistical Evaluation of the Crime-Deterrent Effects of the San Francisco Crime Camera Program". University of California-Berkley. March 17, 2008. http://www.igert.org/highlights/11

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[xxii] Clouse, Thomas. "Pullman punching back". *The Spokesman-Review.* November 20, 2007. www.spokesmanreview.com/stories/2007/nov/20/pullman-punching-back/?print-friendly

[xxiii] Brew, Nigel. "An overview of the effectiveness of closed circuit television (CCTV) surveillance." Parliament of Australia: Research Note no. 14 2005-06. October 28, 2005. http://www.aph.gov.au/library/pubs/rn/2005-06/06rn14.htm

[xxiv]Preliminary analyses (not shown here, available from researchers) found that this control was not significantly related to any of the primary latent variables as outcomes and its inclusion or exclusion had no effect on the other relationships in each model. Therefore, as it was more of a methodological control, rather than a substantive one, it was excluded from the final analyses reported below.

[xxv] Population estimates for 2014 are not yet available from the U.S. Census, so 2013 population was used to calculate the February through April, 2014, crime rates. While not ideal, the relatively small change in the Pullman population size between 2012 and 2013 (an increase of only 95 residents), alleviates some concern. Future research, however, should calculate the 2014 crime rate using 2014 population estimates to verify the findings presented later in this study.

[xxvi] Although many studies report crime rates per 100,000 population, or even higher levels, due to Pullman's small size, a measure using rates per 10,000 population is more appropriate.

[xxvii] Sayrs, Lois W. (1989). *Pooled time series analysis.* Newbury Park, CA: Sage.

[xxviii] Null models for each of the primary latent variables were also analyzed (not shown here, available from the researchers). Dependence of error terms was observed for each variable, thereby justifying and necessitating MLM techniques.

[xxix] As discussed earlier in this section, each of the four primary latent variables will be analyzed separately as a dependent variable and should therefore not be included as an independent variable in its own equation. For ease of presentation, however, the dependent variable, identified as Y_{ij} in the above equation, is left as a generic placeholder and would be replaced by each primary latent variable as it takes its turn as the dependent variable.

[xxx] See above.

[xxxi] Pseudo r-square values were calculated by subtracting the variance component at each level (respondent-level and wave-level), for each model, from the variance component for the corresponding null models (i.e., the variance component for Model 1 was subtracted from the variance component for the Satisfaction with Police null model). That difference was then divided by the corresponding null model's original variance component to determine what percentage of the variance in the null model was explained by each of the four final models, at each level, that are presented in Table 1.2.

[xxxii] e.g., Chiricos, T., Padgett, K., & Gertz, M. (2000). Fear, TV news, and the reality of crime. *Criminology, 38*(3), 755-786.

[xxxiii] e.g., LaGrange, R.L. & Ferraro, K.F. (1989). Assessing age and gender differences in perceived risk and fear of crime. *Criminology 27*(4), 697-720.

[xxxiv] In fact, for not only this relationship, but for all the relationships amongst the primary latent variables, it would be enlightening to examine how each primary latent variable at an earlier time period affected the other primary latent variables at later time periods. This would allow us to determine whether it respondents who are fearful of crime are truly just hoping that the cameras will reduce crime, or alternatively if people's confidence in the cameras only breeds more fear. Unfortunately, such analyses are beyond the scope of this study, but should be examined in future endeavors.

[xxxv] Richards, Othello. "Campus surveillance cameras help Pullman police". *KREM.com*. April 11, 2013. http://www.nwcn.com/news/washington?fId=202628721&fPath=/home&fDomain=10222