CRIMINOLOGY

BODY-WORN CAMERAS AS A POTENTIAL SOURCE OF DEPOLICING: TESTING FOR CAMERA-INDUCED PASSIVITY*

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Contentious debate is currently taking place regarding the extent to which public scrutiny of the police post-Ferguson has led to depolicing or to a decrease in proactive police work. Advocates of the "Ferguson effect" claim the decline in proactive policing increased violent crime and assaults on the police. Although police body-worn cameras (BWCs) are touted as a police reform that can generate numerous benefits, they also represent a form of internal and public surveillance on the police. The surveillance aspect of BWCs suggests that BWCs may generate depolicing through camera-induced passivity. We test this question with data from a randomized controlled trial of BWCs in Spokane (WA) by assessing the impact of BWCs on four measures: officer-initiated calls, arrests, response time, and time on scene. We employ hierarchical linear and cross-classified models to test for between- and within-group differences in outcomes before and after the randomized BWC rollout. Our results demonstrate no evidence of statistically significant camera-induced passivity across any of the four outcomes. In fact, self-initiated calls increased for officers assigned to treatment during the RCT. We discuss the theoretical and policy implications of the findings for the ongoing dialogue in policing.

> Nobody says it on the record, nobody says it in public, but police and elected officials are quietly saying it to themselves. And they're saying it to me, and I'm going to say it to you. And it is the one explanation that does explain the calendar and the map and that makes the most sense to me. Maybe something in policing has changed. In today's *YouTube* world, are officers reluctant to get out of their cars and do the work that controls violent crime? Are officers answering 911 calls but avoiding the informal contact that keeps bad guys from standing around, especially with guns?
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> —Former FBI Director James Comey, October 23, 2015

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Since the summer of 2014, there has been a series of high-profile, controversial police killings of citizens resulting in public protest, civil disorder, and a national movement demanding police reform (i.e., Black Lives Matter). The deaths of Michael Brown, Freddie Gray, Eric Garner, Tamir Rice, Walter Scott, and others have highlighted a current crisis in police legitimacy (White and Fradella, 2016). In response to public demand for police reform, the White House created the President's Task Force on 21st Century Policing in late 2014, and former President Obama "charged the task force with identifying best practices and offering recommendations" to build community trust and enhance police accountability. The final report of the Task Force (2015) includes dozens of recommendations for change, and police body-worn cameras (BWCs) are highlighted as a tool that may be able to help alleviate the current crisis in police legitimacy.

BWCs have been diffused widely in law enforcement over the last few years in part because of significant federal support through funding and technical assistance (Bureau of Justice Assistance, 2016; Department of Justice, 2016). Moreover, the findings from a rapidly growing body of research show that BWCs can produce a range of positive outcomes, including reductions in use of force and citizen complaints (e.g., Ariel, Farrar, and Sutherland, 2015; Hedberg, Katz, and Choate, 2017), enhanced prosecution outcomes (Morrow, Katz, and Choate, 2016; Owens, Mann, and McKenna, 2014), and increased perceptions of procedural justice (White, Todak, and Gaub, 2017).

At the same time, several concerns have been raised about BWCs, including officer and citizen privacy, policy questions, and cost/resource requirements. Some critics view BWCs as part of a larger technological movement to scrutinize police publicly. In this sense, their criticism is valid: Advocacy groups support BWCs because of their potential to monitor police officer behavior (Stanley, 2015). Recording the actions of the police is certainly not new; BWCs, however, come at a time in policing history that is different from past eras. Social media, smartphones, smartphone apps (e.g., the ACLU's Mobile Justice app for recording police conduct), and other common technology makes filming police actions—both good and bad—exceedingly easy. Surveillance comes from both within police organizations and the public and has the potential to lead to attitudinal and behavioral changes among police. For example, BWCs have not been univerally embraced, and in some jurisdictions, police officers have adamantly opposed cameras (Allen, 2016).

More generally, some have speculated that this increased public scrutiny of officers has led to "depolicing" or to an intentional reduction in police officer activity (Rushin and Edwards, 2017). Former FBI Director James Comey has repeatedly linked the intense focus on police with less aggressive police tactics, suggesting that the "viral video effect" reduces officer proactivity (Lichtblau, 2016, paragraph 2). Comey's (2015) quote at the beginning of the article underscores the point. Mac Donald (2016b) asserted that public scrutiny of police has led to increases in violent crime and attacks on police officers via a "Ferguson effect." The allegations from Director Comey, Mac Donald (2016a), and others suggest that surveillance technologies are part of the reason for the current crisis in policing as the increased scrutiny of police causes officers to pull back from the more discretionary aspects of their job. Findings from a few recent studies have demonstrated decreases in officer activity post-Ferguson (Shjarback et al., 2017). Moreover, some researchers have suggested that the potential for depolicing may vary depending on local conditions (Wolfe and Nix, 2016). There is also a body of psychological research in which enhanced surveillance of employees has been

demonstrated to affect employee motivation negatively and even to lead to counterproductive workplace behaviors (de Vries and van Gelder, 2015; Martin, Wellen, and Grimmer, 2016).

Unfortunately, the degree to which BWCs may generate depolicing remains an open question. Do BWCs cause officers to become less proactive? Do BWCs affect officer response time, as well as how long they spend at a call? Do BWCs affect officers' arrest activity? The potential for BWCs to alter police officer activity negatively is a serious concern that could short-circuit the primary benefits of the technology. The lack of research on the question is troubling, especially given the widespread diffusion of the technology in law enforcement agencies and the significant variation in local conditions where cameras are being deployed.

In this study, we address this research gap by testing for the emergence of depolicing using data from a randomized controlled trial of BWCs in Spokane, Washington. The term "camera-induced passivity" is employed to describe a hypothesized form of depolicing: Given the potential for BWCs to generate increased surveillance of officer actions, officers reduce their activity to avoid exposure to scrutiny and discipline. To assess the presence of camera-induced passivity, we use four indicators that capture two dimensions of police behavior: officer activity (officer-initiated calls and arrests) and time on task (response time and time on scene). We also use hierarchical and cross-classified linear and logistic models to investigate within- and between-group (BWC and non-BWC officers) differences in outcomes both before and after the BWC rollout to test for the presence of camera-induced passivity.

EMERGENCE OF POLICE BODY-WORN CAMERAS

Law enforcement interest in BWCs predates the current crisis in policing by ~10 years. Several law enforcement agencies in the United Kingdom began experimenting with the technology as early as 2005 (Goodall, 2007; ODS Consulting, 2011), and several North American law enforcement agencies piloted BWCs from 2010 to 2012 (i.e., Oakland, CA; Phoenix, AZ; and Victoria, BC, Canada). The results of a survey conducted in 2013 revealed that approximately one third of responding law enforcement agencies had already deployed BWCs to some of their officers (Reaves, 2015a).

Interest in BWCs skyrocketed after the summer of 2014, sparked by a series of citizen deaths at the hands of the police. The tragic deaths of Eric Garner, Michael Brown, Walter Scott, and others generated interest in BWCs across a wide range of sectors including the federal government (President's Task Force on 21st Century Policing, 2015), police leadership organizations (Miller, Toliver, and Police Executive Research Forum, 2014), civil rights groups (American Civil Liberties Union, 2015; Stanley, 2015), and citizens (Sousa, Miethe, and Sakiyama, in press). The surveillance aspects of BWCs are central to their widespread support, both in terms of transparency with the community and as a mechanism for police accountability. The focus on BWCs was intensified because in a handful of early studies, scholars reported significant reductions in citizen complaints against officers and police use of force after deployment of BWCs. An evaluation of BWCs in the Rialto (CA) Police Department documented a nearly 90 percent drop in citizen complaints against police and a 60 percent decline in use of force (Ariel, Farrar, and Sutherland, 2015). Similarly positive results emerged from studies in Mesa (AZ; Mesa Police Department, 2013), Orlando (FL; Jennings, Lynch, and Fridell, 2015), Phoenix (AZ;

Katz et al., 2014), and most recently, Las Vegas (NV; Braga et al., 2017). Although mixed results have been reported in recent studies (Ariel et al., 2016; Grossmith et al., 2015; Yokum, Ravishankar, and Coppock, 2017), the weight of the evidence suggests BWCs can generate reductions in these important outcomes (Hedberg, Katz, and Choate, 2017; White, Gaub, and Todak, 2018).

In several studies, researchers have documented additional BWC-generated benefits. Morrow, Katz, and Choate (2016) reported that BWCs led to enhanced criminal justice outcomes for domestic violence cases (see also Owens, Mann, and McKenna, 2014). White, Todak, and Gaub (2017) found a connection between citizen awareness of a BWC and increased citizen perceptions of procedural justice. Research findings have also shown that line officer support for BWCs is high, although it varies by department and tends to increase after deployment (Gaub et al., 2016; Jennings, Fridell, and Lynch, 2014). Study outcomes have similarly shown that citizen support for BWCs is high among both the general population (Crow et al., 2017; Sousa, Miethe, and Sakiyama, in press) and citizens who have BWC-recorded encounters with police (White, Todak, and Gaub, 2017).

Opponents of BWCs ground their critiques in a complex range of issues such as cost/resource commitment, officer privacy, training and policy requirements, and operational issues (e.g., failure to activate; Bakst and Foley, 2015; Gaub, Todak, and White, 2017). Civil rights advocates highlight concerns involving citizen privacy, such as access to public records and the recording of vulnerable populations (e.g., children; Harris, 2010; Stanley, 2015). Several police unions have challenged the rollout of BWCs as a change in working conditions that must be addressed in collective bargaining. Another important critique involves the potential for BWCs to reduce police activity (Ready and Young, 2015): BWCs represent a "doubling down" in surveillance that may lead to depolicing through camera-induced passivity.

"FERGUSON EFFECT" AND DEPOLICING

A contentious debate has emerged over the existence of a "Ferguson effect," whereby enhanced scrutiny of the police since Michael Brown's death has caused increases in both crime and felonious attacks on police because officers are shying away from proactive police work (Frankel, 2015; Mac Donald, 2016a).[1] Scholars have noted that when police behavior becomes more heavily constrained, police are less motivated to initiate contacts with the community (Oliver, 2017; Rushin and Edwards, 2017). Shjarback et al. (2017) argued that this change in behavior is grounded in officers' drive for self-preservation: They refrain from putting themselves in positions that increase risk of discipline, demotion, public ridicule, injury, or death. In other words, officers adopt avoidance behaviors as a response to internal and public scrutiny.

1. A second hypothesis argues that public incidents of police misconduct and brutality have a harmful effect on the public's trust in the law and law enforcement. As a result, people may be less likely to abide by the law or to obey the police because they no longer believe either represents their best interests (see, e.g., Jackson et al., 2012; Tyler, 2006). Relatedly, defiance theory suggests that citizens become enraged by official acts of injustice and act out in criminal ways (Campbell, Nix, and Maguire, in press; Sherman, 1993). Each of these pathways can lead to increases in overall crime rates.

A few scholars have sought to test directly for a Ferguson-generated depolicing effect, with mixed results.[2] Maguire, Nix, and Campbell (2017) found no evidence that the events in Ferguson (and after) led to an increase in felonious killings of police officers. Campbell, Nix, and Maguire (in press) reported nonsignificant results with the number of citizens shot by police. Pyrooz and colleagues (2016: 1) tested for a Ferguson effect by examining crime rates in 81 U.S. cities 12 months before and after August 2014, and they reported: "No evidence was found to support a systematic post-Ferguson change in overall, violent, and property crime trends" (see also Towers and White, 2017).

Some evidence suggests officer-activity levels may have changed post-Ferguson. Morgan and Pally (2016) found that Baltimore Police arrest patterns declined significantly "post-Ferguson" and even further after the death of Freddie Gray (rates increased after appointment of a new police chief). Similarly, Shjarback and colleagues (2017) found Missouri police agencies conducted 67,000 fewer traffic stops in 2015 compared to 2014, with the biggest declines observed in predominantly African American municipalities.

Several studies have been aimed at examining officer attitudes about a Ferguson effect, and here too the results are mixed. Morin and colleagues (2017) reported strong evidence that officers' perceptions of their jobs, personal safety, and willingness to be proactive have changed significantly post-Ferguson: 86 percent felt fatal encounters between Black citizens and police officers made their jobs more difficult; 93 percent were more concerned for their personal safety; and 76 percent said they were more reluctant to use force. The results of two studies reveal that officers are differentially affected by a Ferguson effect, with perceptions of organizational justice serving as a protective factor (Nix and Wolfe, 2016; Wolfe and Nix, 2016).

BODY-WORN CAMERAS AND POTENTIAL FOR DEPOLICING

Within the current atmosphere of police scrutiny, BWCs are supported primarily because of their surveillance potential, either to demonstrate transparency to citizens or to monitor officer behavior. Officers' drive to self-preserve may be heightened when equipped with a BWC because they are keenly aware the camera allows for both external and internal scrutiny of their actions. This raises the question of whether BWCs cause officers to become less proactive.

No studies have been aimed at examining depolicing and BWCs, but an understanding of officer motivation is critical to explaining depolicing. Motivation is defined as the "forces that energize, direct, and sustain behavior" (Perry and Hondeghem, 2008: 2). To meet their job responsibilities, most individuals are motivated by something, be it a paycheck, accolades, or other types of rewards. Police officers are commonly motivated by more intrinsic rewards (Crewson, 1997; Houston, 2000), which include helping others or a sense of obligation to serve the community (Brewer, Coleman Selden, and Facer, 2000; Oberfield, 2014; Raganella and White, 2004).

But motivations can be altered by local conditions within and outside of the police department, and these conditions may either increase or decrease the risk for BWCs to generate depolicing. If officers feel that BWCs are being forced on them from external

2. Others have tested for a Ferguson effect on crime generally with mostly null results (Pyrooz et al., 2016; Rosenfeld, 2015; Shjarback et al., 2017; Towers and White, 2017).

forces, such as political leaders, they may be less likely to embrace the technology. Moreover, police officers are more motivated when they believe that they are supported by their organization and their supervisors (Gillet et al., 2013). Nix and Wolfe (2016), for example, found that officers who perceived high levels of organizational justice were less likely to report changes in their activity (depolicing). If line officers have been excluded from the BWC planning process, they may perceive lower levels of organizational justice and be more likely to resist the technology (Kyle and White, 2017). Officers may then be acutely aware of a transparency double standard: The message to the community is one of transparency, but there has been no transparency internally for the officers themselves. Officers' perceived disconnect between internal and external transparency, along with the surveillance aspects of BWCs, may leave them vulnerable to camera-induced passivity.

Ariel et al. (in press) noted that the effects of BWCs on officer behavior are determined by a delicate balance between officer discretion and deterrence. BWCs have a deterrent effect on officer misuse of force in that BWCs provide surveillance that increases the likelihood of sanctions. Ariel et al. (in press: 1) argued that optimal deterrence can be achieved with strong controls on discretion, but when a department applies an approach that is too heavy-handed, "'over-deterrence' and even 'inertia' are possible, which are manifested in police withdrawal." Officers under a state of overdeterrence are likely to see BWCs as just another form of surveillance designed to scrutinize their behavior (Ariel, 2016; Tankebe and Ariel, 2016).

This negative officer perception of BWCs may be justified in agencies that have not properly addressed how BWC footage is to be used for examining policy compliance and supervision. Many electronic monitoring technologies, like BWCs, have "function creep" and can "yield more information than intended" (Ball, 2010: 93) about employees. It may be in officers' best interests to remain skeptical of BWCs until the department has explicitly delineated how BWCs will be used for surveillance (i.e., supervisory) purposes.

Furthermore, public and departmental scrutiny of officers via BWC surveillance may reshape the factors that motivate officers to engage in proactive policing work, leading to negative workplace behaviors (e.g., avoiding responsibilities and even aggression). Scholars in industrial psychology have shown that surveillance of employees is linked to counterproductive workplace behaviors and workplace deviance (de Vries and van Gelder, 2015; Martin, Wellen, and Grimmer, 2016). Workplace deviance begins to develop when surveillance becomes a means to exert more control over the employee (Ball, 2010). Under the circumstances of increased control, employees are more likely to "subvert and manipulate the boundaries of when, where and how they are measured" (Ball, 2010: 93). For instance, Frenkel et al. (1998) and Callaghan and Thompson (2002) both showed that as surveillance increased, employees increasingly engaged in surveillance resistance and in some cases, sabotage (see also Martin, Wellen, and Grimmer, 2016). Greenberg and Barling (1999) found that employees who reported experiencing workplace surveillance were more likely to be aggressive toward their supervisor. Through their surveillance capacity, BWCs increase the department and public's control over officers (Ariel et al., in press). Thus, coupling motivational issues, increased scrutiny, function creep, and the negative relationship between employee surveillance and counterproductive workplace behavior can inform how we understand the potential relationship between BWCs and de-policing.

OFFICER ACTIVITY LEVELS AND BWCS

Although no studies have been aimed at examining BWCs as a source of depolicing, a few have been focused on exploring the impact of BWCs on officer activity.[3] Officers in Phoenix and Tempe, AZ, as well as Spokane, WA, were surveyed pre- and post-BWC deployment on a range of issues, including the impact on their activity level (Gaub et al., 2016). Phoenix officers expressed a good deal of concern, as 65 percent agreed/strongly agreed BWCs would lead them to have fewer contacts with citizens; from 24 percent to 31 percent of Spokane and Tempe officers also expressed that concern. Officer attitudes remained stable pre- and post-BWC deployment. Alternatively, Jennings, Fridell, and Lynch (2014) surveyed Orlando, FL, police officers pre-BWC deployment, and 84 percent indicated BWCs would not reduce their willingness to respond to calls for service.

Researchers have also considered the impact of BWCs on specific types of officer activity, and the findings are mixed. Katz et al. (2015) found that BWC-assigned officers increased their arrest activity by more than 40 percent after camera deployment. The Rialto Police Department reported a notable increase in citizen contacts after BWC deployment (Dillon, 2013). Braga et al. (2017) also reported increases in arrests and citations among BWC officers but no change in officer-initiated activity. Alternatively, Grossmith et al. (2015: 1) reported no impact on "the number or type of stop and searches," self-reported activity, or arrest decisions. Ariel et al. (2016) found an association between BWCs and increased assaults on officers, and they noted that BWCs may cause officers to become less assertive during calls, which may increase vulnerability to assault. Ready and Young (2015: 454) conducted the most extensive study of BWCs and officer activity to date, and they concluded:

> At the outset of the study, a major concern among the commanding officers was that body-worn cameras might cause officers to be less proactive or more reluctant to initiate contacts with citizens, instead focusing most of their time on dispatched calls. We found this not to be the case. On the contrary, camera officers actually initiated significantly more contacts with citizens than comparison officers.

Ready and Young (2015) did find BWC officers made fewer arrests and issued more citations, which the authors attributed to officers' concerns about supervisory review of their decisions.[4] In sum, a few studies have been aimed at examining the impact of BWCs on officer activity measured as citations, arrests, and officer-initiated contacts (e.g., stops), and there is little consistency in findings. Moreover, only in the Rialto (Ariel, Farrar, and

3. Setting aside the surveillance issue, researchers have shown that police officer activity levels can be affected by a range of factors. Engel (2002) found that officer time devoted to self-intiated calls was related to precinct activity level, as well as to officer characteristics (e.g., race and gender). Smith and colleagues (2005) found that Black officers performed significantly more community-oriented activities than did White officers, whereas Wu and Lum (2017) reported officers were more likely to be proactive in high-crime areas (see also Lersch, 2002; Terrill and McCluskey, 2002). Officer activity levels have also been linked to the manner in which their behaviors are supervised (Engel, 2002).
4. Hedberg, Katz, and Choate (2017) noted that Ready and Young (2015) failed to control for the interaction between volunteer status and the treatment effect (the study involved both volunteers and officers required to wear a BWC). Hedberg, Katz, and Choate (2017: 7) re-ran their analyses and stated, "If there are differences between the volunteers and non-volunteers, then the paper only plausibly reflects the impact of the non-volunteers."

Sutherland, 2015), London (Grossmith et al., 2015), and Las Vegas (Braga et al., 2017) studies were randomized designs employed.

The extent to which BWCs—a technology that increases scrutiny of the police—contributes to depolicing remains unknown. The consequences of depolicing are significant, and the question of whether BWCs produce camera-induced passivity warrants research attention. We employed an RCT in Spokane (WA) to investigate camera-induced passivity with two of the three activity measures examined in prior studies (officer-initiated activity and arrests), as well as with two measures of time on task (response time; time on scene).

METHOD

DESIGN AND DATA

The current study is part of a larger project examining the impact and consequences of BWCs in Spokane. In early 2015, the Spokane Police Department (SPD) initiated a staggered rollout of BWCs to all patrol officers in two phases ($N = 149$).[5] The SPD leadership worked with us to randomize the process by which officers were selected for the first (May 2015; treatment group [$n = 82$]) and second (November 2015; control group [$n = 67$]) phases of the deployment. More specifically, we obtained a complete list of all patrol officers and randomly assigned individuals to either treatment or control using a random number generator in Microsoft® Excel™. The officers in each group received their BWCs on a rolling schedule as groups of officers were trained on consecutive Fridays during the two deployment months.[6] For treatment officers, the RCT began on the day they received a camera in May 2015. All activity that occurred before that day is considered pre-RCT activity. The same principle applies for the control officers who received their BWC on consecutive Fridays in November 2015. In short, the RCT period—when one group had BWCs and the other did not—is 6 months.

SPD provided us with all computer-aided dispatch (CAD) data from January 2013 through April 2016. We limited the calls in the CAD data in two ways. First, SPD sometimes responds to out-of-city calls as back-up law enforcement. These calls were removed from the data. Second, the 149 officers in the BWC study do not represent the entire sworn force of SPD (higher ranks, new hires, etc.), but they do represent all officers on patrol assignment at the time of the RCT. The data are limited to include only calls answered by the officers in the study.[7]

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5. The SPD implemented a small-scale pilot study of BWCs in fall 2014, involving approximately 20 volunteer officers. This pilot study occurred prior to the authors' collaboration with the agency, although most of the pilot study officers continued to wear their BWCs up to the start of the RCT.
6. The BWC training was included as part of an 8-hour required use-of-force report writing training. Training occurred in two parts. The first part consisted of classroom-based instruction, which was focused on laws and policy governing use of the cameras. Officers were also trained in BWC operational use. The second part consisted of scenario-based training, in which officers participated in mock citizen interactions and use-of-force scenarios while wearing the BWC. After the mock scenarios, officers learned to complete reports incorporating the video evidence. One of the authors observed the BWC training on several occasions.
7. When the study began, our sample included all patrol officers in the SPD. Over the course of the study, however, the SPD hired new officers who were involved in patrol duties. These individuals are not included in the study.

DEPENDENT MEASURES

We examine four dependent measures capturing two different dimensions of officer behavior: officer activity and time on task. The first measure of officer activity is whether the call was *officer initiated*; this information is captured in the CAD. Officer-initiated calls are coded as a dummy variable where 1 indicates the call is officer initiated and 0 shows that the call is from dispatch. The second officer activity measure is *arrest*, where 1 designates that the call resulted in arrest.[8] All arrests are included in the measure regardless of how the call began (officer initiated or reactive), but the measure does not include lesser forms of activity (e.g., warnings or citations).

Next, two dependent variables capture officer time on task. The first is *response time*, measured as the length of time, in minutes/seconds, it takes for the officer to arrive on scene for a call. The second time on task measure is *time on scene*, or the length of time, in minutes/seconds, an officer is on scene before clearing the call. The time on task measures have not been examined in prior research on BWCs and officer activity. We include them in this analysis because of their relevance to the potential for camera-induced passivity. If BWCs do generate depolicing, officers will be more likely to avoid calls or delay in responding to them in hopes of another officer taking the call. Moreover, when on scene, the officer who has experienced camera-induced passivity is focused on resolving the call as quickly as possible to disengage from the citizen(s). These time on task claims go directly to Shjarback et al.'s (2017) assertion that depolicing is grounded in an officer's desire for self-preservation as the officer avoids or minimizes activities that increase risk of public or departmental scrutiny.

INDEPENDENT AND CONTROL MEASURES

The first independent variable is *treatment assignment*, where 1 signals that the officer was assigned to the treatment group (0 = control group assignment). Our approach to examining the effects of treatment is "intent to treat," where we focus on the relationship between random assignment to the experimental groups and the outcomes (Imbens and Rubin, 2015). Thus, the effect of this variable is the impact of being assigned to treatment. Conversely, we could place actual treatment behavior in the model; however, because of deliberate choices made by some officers to depart from their assignment, an estimator of actual treatment behavior would result in systematic differences in the outcomes between individuals who received treatment and those who did not. More specifically, there were 12 departures from random assignment (8 percent departure rate). Eight randomization departures involved officers who participated in the department's BWC pilot study prior to the phased rollout and were randomly assigned to the control group but asked to keep their BWCs. Along with the SPD leadership, we agreed to reassign those officers to the treatment group. The remaining departures occurred as a result of officers missing their assigned BWC training because of injury, family leave, vacation, or similar reasons. Four officers were removed from the study because they retired or transferred to a nonpatrol assignment during the RCT period (and were no longer assigned a BWC). Thus, even

8. Arrest rates have long been a measure of police productivity because officers can use their discretion to change how many arrests they make (Zhao, Zhang, and Thurman, 2011). Officers commonly face situations where they can decide to warn, cite, or arrest an individual, depending on the reason for contact, so officers partially dictate their rate of arrest.

though we know of some reasons for departure from random assignment, some may be unobserved. By examining "intent to treat," rather than receipt of treatment, we can obtain an unbiased estimate of assignment to treatment (Imbens and Rubin, 2015).

RCT period is a dummy variable denoting the months of the randomized control trial period, during which only treatment officers were assigned cameras (1 = May 2015 to November 2015; 0 = otherwise). *Post-RCT period* represents the post-randomized control trial period, during which all officers have cameras (1 = December 2015 to April 2016; 0 = otherwise). The reference category for both variables is the months prior to the beginning of the RCT, from January 2013 to April 2015. Next, we employ several interaction terms that are of interest: treatment officer and both the RCT and post-RCT periods (displayed as *TX officer* × *RCT period* and *TX officer* × *Post-RCT period*). The first interaction represents the most direct test of the camera-induced hypothesis as it captures treatment officer behavior during the RCT (when treatment officers had cameras and control officers did not). The second interaction captures treatment officer behavior over the long term into the period when all officers have cameras.

An important control variable in our study is contamination. In many RCTs involving BWCs, it is difficult to account in full for contamination. To date, no one has been able to limit completely or account for contamination at the department level; after all, researchers cannot eliminate conversations in the locker room, gym, or roll call. A different type of contamination, however, needs to be accounted for, namely, when control and treatment officers work together and how the interaction of these groups impacts the dependent variables. In our study, we differentiate this contamination by distinguishing between contamination that occurs prior to officers having an interaction with a citizen and contamination that occurs after citizen contact has been made (i.e., at the scene).

The first form of contamination, one that occurs prior to citizen contact, applies to the dependent variables of officer-initiated calls and response time. Here, a decision to stop or the time it takes to respond to a call may be influenced by whether the officer is working with another officer in a different experimental group. As an example, a control officer may feel compelled to respond faster or to initiate a stop knowing that a treatment officer shares his or her patrol car. Alternatively, having a treatment officer in the patrol car may make the control officer feel more "at risk" for supervision, resulting in fewer stops and a more delayed response to calls. This type of precontact contamination is measured as whether the patrol car contains two officers of different experimental group assignment (measured as Yes = 1, No = 0). Approximately 3.37 percent of all calls during the RCT period experienced precontact contamination. Given the low number of calls that experience precontact contamination, we eliminated these calls for the analysis of the *officer-initiated call* and *response time* outcomes. This results in the exclusion of 1,269 calls.

The second type of contamination is that with which policing research is more familiar, where officers of different experimental groups interact at the same call. This type of contamination—*postcontact contamination*—is measured as the presence of a treatment officer and a control officer at the same call (measured as Yes = 1, No = 0). Postcontact contamination, therefore, applies to the outcomes of *arrest* and *time on the scene*. Here, control officers may be more likely to arrest in discretionary circumstances or remain on the scene for longer than necessary with treatment officers present, both as a response to the increased scrutiny via BWC footage. Or if camera-induced passivity occurs (through the treatment officer's presence), control officers may be less likely to arrest, and they may shorten their time on scene to reduce risk. Approximately 49.67 percent of all

calls during the RCT period experienced *postcontact contamination* (where 1 = postcontact contamination, 0 = no contamination). *Postcontact contamination* is used as a control variable when modeling the outcomes of *arrest* and *time on scene*, and is interacted with *treatment officer* (i.e., *Postcontact contamination* × *TX Officer*) to assess how treatment officers' behavior may change when a call is contaminated.

Although control variables are not typically needed in an RCT, we include controls because we do not randomize calls to officers, and because the analysis includes calls before and after the RCT period. The control variables reflect officer-level characteristics. *Tenure at SPD* is the number of years the officer has been employed at SPD (continuous variable with 0 = less than 1 year of service). Officer sex is captured in *male* (Male = 1; Female = 0). Officer rank is controlled through a dummy variable, *supervisor*, denoting that the officer supervises others and is ranked as a corporal or sergeant. The reference category here is line officer rank and includes police officer, officer first class, and senior police officer. There is also a control for citizen complaints against the officer (*complaint against officer in current month*), as receiving a complaint may affect officers' subsequent proactivity (1 = complaint in current month; 0 = no complaint). Finally, there is a variable for *linear time*, measured in months, which accounts for the underlying changes in overall patterns in calls for service and crime in Spokane.

For the time on task outcome measures (*response time* and *time on the scene*), two additional controls are used. *Officer-initiated call* is a dummy variable signaling that the officer initiated the call. Such calls will, by definition, have a shorter response time. Lastly, response time and time on scene will vary by call priority. Officers will arrive more quickly to high-priority calls, which also may be more complex and require more time on scene. Unfortunately, we were not able to capture call priority in the data. Instead, we include a proxy measure, *response time over 8 minutes*, to account for call priority based on the logic that low priority calls will likely have much longer response time. The cut-off of 8 minutes was chosen as it represents the 75th percentile in call length. Table 1 displays all summary statistics for the aforementioned variables, for the total sample, and for both the treatment and control groups. No differences between treatment and control groups reached statistical significance.

ANALYSIS PLAN

The data have multiple issues with dependency among cases, requiring a type of statistical analysis that can accommodate data dependency without generating overly small standard errors. For some models, variability in the outcome is dependent on which officer generates the activity, whereas in other models, outcomes are not just related to the officer but also to where activity takes place (i.e., beat). Given that policing scholars have identified two broad influences on police behavior—differences between officers (Banton, 1964; Bayley and Mendelsohn, 1969; Black, 1971; Klinger, 1997; Werthman and Piliavin, 1967) and the environment in which policing occurs (Bittner, 1967; Brown, 1988; Muir, 1977)—we aim to account for both through this analysis.[9] To do this, we use hierarchical, means-as-outcomes models (i.e., random intercept models; Raudenbush and Bryk, 2002)

9. The findings from prior research also highlight the role of organizational factors on police behavior (Fyfe, 1988; Walker, 1992), but we set aside that class of variables given the current study involves only one police department.

Table 1. Summary Statistics

	Treatment				Control				All Officers			
Variable	Mean	Standard Deviation	Minimum	Maximum	Mean	Standard Deviation	Minimum	Maximum	Mean	Standard Deviation	Minimum	Maximum
Response Time in Minutes	5.230	7.025	0	59	4.309	6.796	0	59	4.795	6.933	0	59
Time on Scene in Minutes	17.968	15.319	0	59	17.080	15.096	0	59	17.551	15.221	0	59
Officer-Initiated Call	.360	.480	0	1	.460	.498	0	1	.407	.491	0	1
Arrest	.054	.226	0	1	.056	.231	0	1	.055	.228	0	1
Officer Assigned Treatment	1.000	.000	0	1	.000	.000	0	0	.529	.499	0	1
Number of Years Served	10.989	7.415	0	34	12.960	.748	1	28	11.917	7.176	0	34
Male	.922	.268	0	1	.851	.356	0	1	.888	.315	0	1
Sergeant or Higher Rank	.132	.339	0	1	.140	.347	0	1	.136	.343	0	1
Complaint Against Officer in Current Month	.017	.129	0	1	.021	.143	0	1	.019	.136	0	1
Response Time over 8 Minutes	.301	.459	0	1	.245	.430	0	1	.275	.446	0	1
Precontact Contamination	.004	.067	0	1	.007	.082	0	1	.006	.074	0	1
Postcontact Contamination	.148	.355	0	1	.007	.052	0	1	.081	.273	0	1

NOTES: Number of Calls = 229,489. Number of Officers = 149. Number of Beats = 26.

where we nest calls in the most appropriate units for the outcome. There are two sets of models—time on task and officer activity—both of which account for the multiple units associated with encounter outcomes.[10]

The time-on-task models are aimed at examining *response time* and *time on the scene*. Given that the base unit in these models is the encounter, two types of nesting need to be accounted for in the models: calls within officers and calls within beats. Although we are specifically interested in between-officer differences, we also nest within beats given that the geography and size of a beat can impact how fast an officer can get to a call. Moreover, beats have varying crime rates that would impact an officer's amount of time on the scene. Thus, we employ cross-classified models where calls are nested simultaneously within beats and officers (j).[11] In the following equation, calls are represented by i, beats by k, and officers by j. In our analyses, there are 149 officers and 26 beats in which calls can be nested. The general cross-classified model equation, which represents both the linear outcomes of response time and time on the scene, is:

$$Y_{ijk} = \beta_0 + \beta_1 TX_{ijk} + \beta_2 RCT_{ijk} + \beta_3 TX_{ijk} * RCT_{ijk} + \sum_{q=1}^{Q} \lambda_q S_{qijk} + \phi_j + \phi_k + e_{ijk}$$

where Y_{ijk} is the outcome (i.e., *response time* or *time on scene* in minutes) for call i conducted by officer j in beat k, β_0 is the grand mean, β_1 is the effect of treatment assignment for officer j, β_2 is the effect of the randomized control trial, and β_3 is the effect of the interaction between treatment assignment and the randomized control trial for officer j. Also, representing controls, λ_q is the effect of the q^{th} predictor S for call i conducted by officer j in beat k; ϕ_j is the random, officer-specific addition to the outcome (i.e., error); ϕ_k is the random, beat-specific addition to the outcome; and finally, e_{ijk} is the call-specific error.

The officer-activity models are hierarchical logistic regression models with calls (i) nested within officers (j). The model is represented as:

$$h(t)_{ij} = \beta_0 + \beta_1 TX_{ij} + \beta_2 RCT_{ij} + \beta_3 TX_{ij} * RCT_{ij} + \sum_{q=1}^{Q} \lambda_q S_{qj} + u_{0j} + e_{ij}$$

where $h(t)_{ij}$ is the probability that the outcome (either *officer-initiated call* or *arrest*) occurred for call i conducted by officer j, β_0 is the intercept for the outcome, β_1 is the effect of treatment assignment for officer j, β_2 is the effect of the randomized control trial, β_3 is the effect of the interaction between treatment assignment and the randomized control trial for officer j, λ_q is the effect of the q^{th} predictor S for call i conducted by officer j,

10. Note that many calls could not be geocoded to the beat by SPD, approximately 51 percent. These calls are excluded from the analyses. To be sure that the deleted calls did not affect the overall analyses for the response time and time-on-scene outcomes, we ran hierarchical linear models nesting only in officers on both outcomes with all calls. The results—both in significance and size of the effect—did not change. As such, we present the more elaborate cross-classified models here, which importantly account for beat.

11. Here we are testing whether officer passivity is taking place; if that is the case, we would see an effect on the *Treatment officer × RCT period interaction*. Cross-classified random effect models limit power, making effects difficult to produce. As a more liberal test of the cross-classified models, we concatenated the officer and beat identifiers into one overall identifier representing each officer-beat combination. We then ran fixed effect models on the response time and time on scene outcomes to allow for a more liberal estimation of the *Treatment officer × RCT period interaction* effect. If there is no effect of the interaction, we can be confident that there is no effect.

u_{0j} is the random officer-specific addition to the outcome (i.e., error), and finally e_{ijk} is the call-specific error.

With each outcome, models are presented in a stepwise fashion: Model 1 estimates treatment assignment main effect, model 2 estimates the effects of treatment assignment by period and contamination (treatment assignment, RCT and post-RCT time periods, and the interaction terms), and model 3 adds the control variables. Model 2 is the "pure RCT" model in that it assesses the behavior of officers assigned to treatment during the RCT and post-RCT periods, assuming group equivalence on all other factors. We acknowledge the power of the group equivalence principle, but each outcome is also modeled with the inclusion of a handful of control variables (model 3). As noted, the controls are included because the results of prior research have shown them to be related to one or more of the outcomes, and because the study period extends—both before and after—beyond the 6-month RCT. Moreover, the inclusion of a model with controls represents a sensitivity test of the robustness of the findings from the "pure RCT" model. The direct test of camera-induced passivity centers on the RCT period, during which one group was assigned BWCs and the other was not. Given the mixed findings in prior research, for the current study, we adhered to the null hypothesis across all four indicators of officer activity: BWCs did not lead to statistically significant reductions in officer-initiated activity or arrests; and BWCs did not lead to statistically significant changes in response time or time on scene.

RESULTS

First, we examine whether there are time trends in our four outcomes. Figure 1 shows the average of each outcome by month over the course of the study. The vertical lines capture the beginning and end of the RCT period. There appears to be an increasing time trend for *response time* and *time on the scene*. Next, *arrest* (lower right-hand graphic) appears to be declining over time. Finally, the percentage of officer-initiated calls is highly variable and does not appear to have much of a time trend. Notably, during the 6-month RCT period, the trend lines for all outcomes are highly variable.

Next, table 2 shows the results from the unconditional models for each outcome, which establishes whether random intercept(s) hierarchical models fit the data better than ordinary least-squares (OLS) regression. Across all outcomes shown here, the variance components are significant, demonstrating that hierarchical modeling fits the data better than non-nested models. The variance components also allow for the calculation of an intraclass correlation (ICC) for the linear outcomes, which reveals the portion of variance in the outcome resulting from the level 2 nesting structure. We do not include the ICCs for the binomial outcomes.[12] The time-on-task models are cross-classified, and therefore,

12. Methods of calculating an ICC for a binomial outcome often assume a continuous latent variable for which the discrete measure coarsens (see Rodriguez and Elo, 2003; Wu, Crespi, and Wong, 2012; Yelland et al., 2002). This is not the case of either arrests or officer-initiated stops. Also, in binomial models, there are no level 1 residuals, and the typical ICC formula does not apply. There have been several formulations of variance partitioning for binomial models, but because our outcomes do not depend on a continuous latent variable, the only available ICC formula depends on a prevalence rate that may not be applicable. Thus, we choose not to display ICCs for our two binomial models.

Figure 1. Time Trends for the Four Dependent Variables

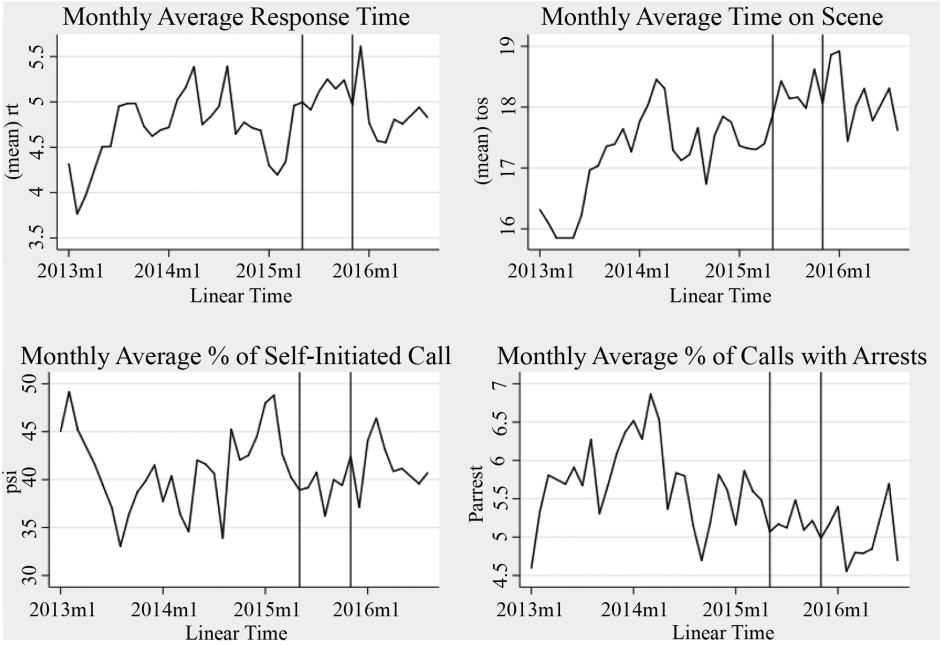

Table 2. Variance Components and Intraclass Correlations (ICCs) for All Dependent Variables

			Variance Component		ICC		
Variable	$\chi 2$	***p***	**Beat**	**Officer**	**Beat**	**Officer**	***n***
Officer-Activity Models							
Officer-initiated calls	56,107.95	.00	—	241.56	—	—	228,220
Arrests	7,268.78	.00	—	6.87	—	—	229,489
Time-on-Task Models							
Response time	17,643.85	.00	4.77	3.55	10.46%	7.80%	229,489
Time on scene	5,107.14	.00	0.84	11.49	0.36%	4.93%	229,489

variability in the outcome is split among the different components of the nesting structure, resulting in smaller ICCs. For *response time*, slightly more than 10.0 percent of the variation in the outcome comes from the beat, and 7.8 percent of the variation comes from the officer. For *time on scene*, the ICCs show that less than 1 percent of the variation in the outcome comes from the beat, whereas slightly less than 5 percent comes from the officer. These low ICCs suggest that much of the variability is a result of the nature of the encounter itself.

OFFICER-ACTIVITY MODELS

Table 3 shows the three nested models for the *officer-initiated call* logistic outcome. Note that for this outcome, contaminated calls are excluded from the analyses. In model 1,

Table 3. Hierarchical Logistic Models Predicting Officer-Initiated Call[a]

	Model 1			Model 2			Model 3		
Variable	***B***	**SE**	**Odds Ratio**	***B***	**SE**	**Odds Ratio**	***B***	**SE**	**Odds Ratio**
Treatment Officer	−.197	(.153)	.822	−.234	(.153)	.791	−.237	(.153)	.789
RCT Period				−.168**	(.024)	.846**	−.167**	(.024)	.846**
Post-RCT Period				−.107**	(.027)	.899**	−.106**	(.027)	.899**
TX Officer × RCT Period				.077**	(.028)	1.080**	.077**	(.028)	1.080**
TX Officer × Post-RCT Period				.142**	(.026)	1.153**	.142**	(.026)	1.153**
Number of Years Served; 0 = 1 year							.006	(.012)	1.006
Male Officer							.100	(.238)	1.105
Sergeant or Higher Rank = 1							.068	(.212)	1.070
Complaint Against Officer in Current Month							−.026	(.038)	.974
Linear Time	.001*	(.000)	1.001*	.003**	(.001)	1.003**	.003**	(.001)	1.003**
Constant	−.153**	(.293)	.316**	−2.443**	(.508)	.087**	−2.595**	(.574)	.075**
Variance Component for the Officer	−.075	(.058)		−.075	(.058)		−.078	(.058)	
Observations	228,220			228,220			228,220		
Number of Groups	149			149			149		

[a]Calls are nested within officer.
*$p < .05$; **$p < .01$ (two-tailed).

there is no effect for *treatment assignment*; in other words, individuals assigned to treatment are not statistically different from officers assigned to the control group with regard to the prevalence of officer-initiated calls. Model 2 adds the *RCT period* and *post-RCT period* variables, and the interactions between RCT, Post-RCT, and Treatment Assignment. First, during the RCT, there is a 15.4 percent reduction in the odds that a call is officer-initiated ($.846 - 1 = -.154$ or −15.4 percent). There is a similar reduction, ~10 percent, of officer-initiated calls during the Post-RCT period ($.899 - 1 = -.101$ or −10.1 percent). This shows that during the experiment and immediately after it, officer-initiated calls declined for all officers. Next, there are significant interactions between treatment assignment and the two time periods. During the RCT period, officers who were assigned to treatment had higher odds of engaging in officer-initiated calls than did officers assigned to the control group; specifically, treatment-assigned officers had approximately an 8 percent higher odds of engaging in officer-initiated calls than did those officers assigned to the control group. This effect continues into the post-RCT period: Officers assigned to treatment had an estimated 15.3 percent higher odds of engaging in officer-initiated calls than did officers assigned to the control group. This finding directly contradicts the camera-induced passivity hypothesis. The inclusion of officer-level controls in model 3 does little to change the effects of these findings. Lastly, across all models, *linear time* is positive and significant.

Table 4 displays the three models for *arrest*. Note that for this outcome, contaminated calls are modeled, rather than excluded, from the analyses. In model 1, *assigned to treatment* is not significant. In model 2, even though *assigned to treatment* remains nonsignificant, there are significant effects for the *RCT* and *Post-RCT* periods. Put another way, arrests were less likely to occur in these periods. This is also reflected in a negative

Table 4. Hierarchical Logistic Models Predicting Arrest[a]

	Model 1			Model 2			Model 3		
Variable	***B***	**SE**	**Odds Ratio**	***B***	**SE**	**Odds Ratio**	***B***	**SE**	**Odds Ratio**
Treatment Officer	.160	(.220)	1.174	.145	(.220)	1.156	.022	(.167)	1.022
RCT Period				−.173**	(.047)	.841**	−.173**	(.047)	.841**
Post-RCT Period				−.206**	(.053)	.814**	−.204**	(.053)	.815**
TX Officer × RCT Period				.139	(.110)	1.149	.130	(.110)	1.139
TX Officer × Post-RCT Period				.057	(.053)	1.058	.056	(.053)	1.057
Postcontact Contamination				.240	(.133)	1.271	.247	(.133)	1.280
TX Officer × Postcontact Contamination				−.339*	(.172)	.713*	−.338*	(.172)	.713*
Number of Years Served; 0 = 1 year							−.070**	(.013)	.932**
Male Officer							−.484	(.258)	.616
Sergeant or Higher Rank = 1							−.257**	(.238)	.285**
Complaint Against Officer in Current Month							.043	(.067)	1.044
Officer Initiated Call							−.078**	(.022)	.925**
Response Time Over 8 Minutes							−.094**	(.023)	.910**
Linear Time	−.008**	(.001)	.992**	−.002	(.001)	.998	−.002	(.001)	.998
Constant	1.665**	(.545)	5.284**	−.707	(.952)	.181	−.048	(.991)	.953
Variance Component for the Officer	.267**	(.069)		.266**	(.069)		−.032	(.070)	
Observations	229,489			229,489			229,489		
Number of Groups	149			149			149		

[a]Calls are nested within officer.
*$p < .05$; **$p < .01$ (two-tailed).

coefficient for *linear time* (arrests decline throughout the entire study period). There is not a significant interaction between treatment officer and RCT period. Finally in model 3, when the officer-level controls are added, the time period effects remain significant. The interaction between *assigned to treatment* and *RCT period* remains nonsignificant. In sum, there is no evidence supporting camera-induced passivity for the arrest measure.

TIME-ON-TASK MODELS

Table 5 displays the models for *response time*. Like officer-initiated calls, for *response time*, contaminated calls are excluded from the analyses. In model 1, *assigned to treatment* is not significant. Model 2 includes the *RCT period* and *post-RCT period* variables as well as their interactions with *treatment officer.* Even though *assigned to treatment* remains nonsignificant, there is a significant effect of the *RCT period*. More specifically, response time increases during the RCT period by around 14 seconds (i.e., .236 × 60 = 14.16). In model 2, the *assigned to treatment* × *RCT period* interaction is nonsignificant. With the inclusion of the officer-specific controls (model 3), the effect of the *RCT period* is no longer significant. With the exception officer-initiated calls (which have a shorter response time, as expected) and linear time, no other variables are significant. Like arrest, there is no evidence of camera-induced passivity in response time.

Table 6 shows the three models for *time on scene*. Like the earlier models of other outcomes, the *treatment officer* variable is not significant (models 1–3). When the variables for the *RCT period*, *Post-RCT, contamination*, and their interactions are included

Table 5. Cross-Classified Hierarchical Linear Models Predicting Response Time[a]

	Model 1		Model 2		Model 3	
Variable	***B***	**SE**	***B***	**SE**	***B***	**SE**
Treatment Officer	.326	(.313)	.342	(.314)	.123	(.239)
RCT Period			.236**	(.087)	.061	(.081)
Post-RCT Period			.102	(.109)	−.094	(.102)
TX Officer × RCT Period			−.063	(.104)	.067	(.097)
TX Officer × Post-RCT Period			−.042	(.120)	.117	(.111)
Number of Years Served; 0 = 1 year					.002	(.018)
Male Officer					−.293	(.372)
Sergeant or Higher Rank = 1					−.344	(.331)
Complaint Against Officer in Current Month					−.013	(.127)
Officer Initiated Call					−5.254**	(.040)
Linear Time	.010**	(.002)	.006	(.003)	.006*	(.003)
Constant	.649	(1.205)	3.329	(1.927)	5.440**	(1.877)
Variance Component for the Beat	4.711**	(.158)	4.721**	(.158)	7.493**	(.156)
Variance Component for the Officer	3.539**	(.060)	3.539**	(.060)	2.002**	(.061)
Level 1 Residual	37.189**	(.002)	37.189**	(.002)	37.189**	(.002)
Number of Beats	26		26		26	
Number of Officers	149		149		149	

[a]Calls are nested in beats and officers simultaneously.
*$p < .05$; **$p < .01$ (two-tailed).

Table 6. Cross-Classified Hierarchical Linear Models Predicting Time on Scene[a]

	Model 1		Model 2		Model 3	
Variable	***B***	**SE**	***B***	**SE**	***B***	**SE**
Treatment Officer	.130	(.569)	.220	(.573)	.185	(.475)
RCT Period			−.046	(.216)	−.175	(.215)
Post-RCT Period			−.656*	(.272)	−.792**	(.270)
TX Officer × RCT Period			−.916	(.689)	−.786	(.684)
TX Officer × Post-RCT Period			−.540	(.298)	−.439	(.296)
Postcontact Contamination			.197	(.783)	.407	(.779)
TX Officer × Postcontact Contamination			.618	(1.043)	.370	(1.037)
Number of Years Served; 0 = 1 year					−.008	(.036)
Male Officer					−.638	(.742)
Sergeant or Higher Rank = 1					−3.863**	(.660)
Complaint Against Officer in Current Month					.898**	(.337)
Officer Initiated Call					−3.008**	(.112)
Response Time Over 8 Minutes					1.075**	(.122)
Linear Time	.046**	(.004)	.064**	(.007)	.065**	(.007)
Constant	−12.198**	(2.753)	−23.473**	(4.650)	−22.196**	(4.710)
Variance Component for the Beat	−.101	(.196)	−.105	(.195)	−.298	(.229)
Variance Component for the Officer	1.218**	(.061)	1.220**	(.061)	1.018**	(.062)
Level 1 Residual	2.698**	(.002)	2.698**	(.002)	2.693**	(.002)
Observations	229,489		229,489		229,489	
Number of Groups	149		149		149	

[a]Calls are nested in beats and officers simultaneously.
*$p < .05$; **$p < .01$ (two-tailed).

(model 2), only the *Post-RCT period* is significant. Here, there is a reduction in *time on the scene* for all officers, equating to ~39 seconds (i.e., .656 × 60 = 39.36). When controls are included in model 3, we see several effects become significant. The main effect of *Post-RCT period* is significant and negative resulting in a decrease of 47.52 seconds (i.e., .792 × ∗ 60 = 47.52), net of controls. Table 6 shows no evidence of camera-induced passivity.

ROBUSTNESS CHECKS

The current study's randomized design suffers from limitations that raise concerns about the stable unit treatment value assumption (SUTVA; Imbens and Rubin, 2015; Maskaly and colleagues, 2017). First, because randomization occurred by officer (not shift), we could not prevent contamination via treatment and control officers patrolling in a two-officer car, responding to the same calls, or otherwise interacting during their shifts.[13] We accounted for this by excluding precontact contamination for the outcomes of *officer-initiated call* and *response time*, and including a measure of postcontact contamination for the outcomes of *arrest* and *time on the scene*. Although we found no significant effects of contamination, future research should be cognizant that contamination manifests in complex ways and can impact experimental groups differently.

DISCUSSION

Even though available research findings have identified numerous benefits for BWCs (White, 2014), there is concern that BWCs have the potential to cause declines in officer proactivity. BWCs are a form of surveillance that increases both external (public) and internal (departmental) scrutiny of officer actions and, as a consequence, may lead to depolicing as officers seek to minimize exposure to risks—professional, safety, or otherwise (Shjarback et al., 2017). The degree to which BWCs contribute to depolicing remains an open question, however. We tested this question with data from an RCT in Spokane (WA) by assessing the impact of BWCs on two indicators of officer activity (officer-initiated calls and arrests) and on two indicators of time on task (response time and time on scene). Our results show that officers assigned to treatment versus those assigned to control significantly differed on only one measure during the RCT period: officer-initiated calls. Notably, officers assigned to treatment became more proactive during the RCT relative to their peers assigned to control, which directly refutes the depolicing thesis. There is no indication of depolicing in the other three outcome measures. Taken together, we find no evidence of BWC-generated, camera-induced passivity in Spokane.

The unique features of BWCs and their diffusion in law enforcement may explain why the technology did not produce strong evidence of depolicing. Although the demand for BWCs spiked after the summer of 2014, law enforcement has been thinking carefully about the technology for nearly a decade. The Bureau of Justice Statistics surveyed law enforcement agencies in 2013, and one third of agencies reported they had already

13. One alternative is to randomize BWCs by shift so that each officer working on a given shift is in the same group. Shifts can then be randomized by week into BWC and non-BWC conditions. The shift randomization arguably eliminates the SUTVA problem. One could also make the case, however, that such an approach results in 100 percent "within officer contamination" as each officer in the study alternates between treatment and control groups week by week. Moreover, this type of assignment does not avoid contamination at the department level.

deployed BWCs to at least some of their officers (Reaves, 2015a). In other words, law enforcement interest in BWCs was growing steadily before the current crisis.[14] Moreover, advocates of BWCs both within and outside of law enforcement recognize a wide range of potential benefits beyond public surveillance of the police. The evidentiary value of BWCs seems clear, especially for criminal prosecutions and lawsuits (Goodall, 2007; Morrow, Katz, and Choate, 2016; Owens, Mann, and McKenna, 2014). Additionally, many police officers see BWCs as a protection against frivolous citizen complaints and lawsuits as well as against incomplete, misleading portrayals of their actions (Gaub, Todak, and White, 2017).

BWCs are also seen by many officers as a mechanism for capturing the entire event in a way that refutes the last-second, out-of-context video that is often captured by a bystander. For example, the audio/video footage can often demonstrate an officer's attempts to de-escalate a situation before having to resort to deadly force (Gaub, Todak, and White, 2017). Advocates have also noted that BWCs allow police to show their human side, as well as their bravery and the valuable work they do every day. In sum, officers' recognition of the benefits of BWCs (Gaub et al., 2016; Jennings, Fridell, and Lynch, 2014) may serve as a protective factor against depolicing.

The explanation for these findings may also be tied to local conditions in Spokane. The adoption of BWCs came as part of a larger, self-driven effort at reform by the SPD. The department experienced a controversial critical incident that strained police–community relations (Leibowitz, 2012), and in the wake of that incident, the community and department cooperatively formed a Use of Force Commission (City of Spokane Use of Force Commission, 2013). One of the recommendations of that commission was the use of BWCs. Additionally, the SPD sought assistance through the Office of Community Oriented Policing Services' (COPS Office) Collaborative Reform process (Community Oriented Policing Services, 2016). Collaborative reform is a "long-term strategy that identifies issues within an agency that may affect public trust and then offers recommendations based on a comprehensive agency assessment for how to resolve those issues and enhance the relationship between the police and the community" (Department of Justice, 2016, paragraph 3).

The Spokane Collaborative Reform team issued a report with more than 40 findings and recommendations, and the department's BWC program was initiated shortly after the release of that report (King, Saloom, and McClelland, 2014). The department leadership actively engaged with the officer's guild (union), as well as with other internal and external stakeholders, during the planning and implementation process. Thus, there were high levels of organizational justice, which may have reduced officers' sensitivity to internal and external scrutiny (Nix and Wolfe, 2016). Moreover, BWCs were not imposed on the department, and in fact, the decision to adopt BWCs was made prior to the summer of 2014 (when a "Ferguson effect" would have started). Local conditions likely play a significant role in the potential for BWCs to generate depolicing, and the Spokane context may have reduced the likelihood for BWCs to generate camera-induced passivity.

The potential for depolicing may also be tied to citizen race. Shjarback and colleagues (2017) found a decline in officer-initiated traffic stops among Missouri police officers

14. Moreover, many view BWCs as a natural extension of dashboard cameras in patrol cars, which have been accepted and prevalent in law enforcement since the early 1990s (Rosenblatt, Cromartie, and Firman, 2003).

post-Ferguson, but most of that change occurred in predominantly African American municipalities. Similarly, in a recent study of officer shooting decisions in realistic deadly force simulators, James, James, and Vila (2016: 457) reported a "reverse racism effect" whereby officers were "slower to shoot armed Black suspects than armed White suspects, and they were less likely to shoot unarmed Black suspects than unarmed White suspects." In Spokane, however, Black citizens make up less than 3 percent of the population. If depolicing is affected by officer fears of becoming involved in a high-profile racialized encounter, then perhaps the local population demographics in Spokane also served to protect against depolicing. Researchers should test for camera-induced passivity in more racially and ethnically diverse jurisdictions.

RISK FACTORS FOR THE ONSET OF CAMERA-INDUCED PASSIVITY

Several risk factors could increase the potential for BWCs to generate depolicing. First, available evidence highlights the importance of a deliberate, collaborative planning process (White, 2014). Line officers and their union should be directly involved in the planning process (as they were in Spokane). If officers are given a voice, allowed to ask questions and express concerns, and are given decision-making power, they are much more likely to trust the leadership's decision to deploy BWCs and to accept the technology (Katz et al., 2015; Kyle and White, 2017). Line officers who are not included in the process are less likely to buy-in, which may result in implementation problems, such as low activation rates (Hedberg, Katz, and Choate, 2017), and may increase the potential for camera-induced passivity.

Moreover, the development of a detailed BWC administrative policy is critically important to avoid depolicing. There is a large body of research in which the effectiveness of administrative policy in controlling police officer decision-making is demonstrated across a wide range of activities including use of deadly and less lethal force, automobile pursuits, canine deployments, and arrest decisions (Fyfe, 1988; Walker, 1992; White and Fradella, 2016). Researchers also highlight the importance of clear, enforceable guidelines governing BWC use (Mesa Police Department, 2013). BWC policies that are clear, widely available and understood by officers, and enforced will serve as a protection against depolicing (Ariel et al., in press).

Last, the depolicing thesis is fundamentally about the police–community relationship. According to the thesis, police feel unfairly targeted and scrutinized by citizens, and they disengage from their duties as a result. Long-standing tension between police and citizens has played out publicly in the streets of Ferguson, Baltimore, and Chicago, among other cities. But the tension between police and minority citizens does not exist everywhere. Many departments have had positive relationships with their community for a long time, with high levels of police legitimacy. An important ingredient for depolicing is low reserves of legitimacy. Depolicing, whether generated through BWCs or some other form of public scrutiny, is not likely to occur in communities where public perceptions of police legitimacy are strong.

The current study suffers from several limitations. First, we relied entirely on official data from the SPD. Researchers have criticized official data in terms of accuracy and completeness (e.g., Manning, 2009), and the findings should be viewed in the context of those concerns. Second, we were forced to use a proxy measure for call priority (response time 8 minutes or longer); other proxies such as number of officers on the scene or call

type could have been used but would have been conflated with contamination.[15] Moreover, we examined four measures of depolicing, all of which are proxy measures of the phenomenon. Self-initiated and arrest activity have been examined in prior research as measures of depolicing, and we added the time-on-task measures (response time, time on scene) to capture the full range of potential effects. Third, we employed a rigorous RCT, but there were several limitations to the research design, including the RCT length (6 months), departures from random assignment (8 percent), and treatment contamination during the RCT. The latter two limitations represent violations to SUTVA, although we sought to account for those violations by including departure and contamination control variables in the models. Ariel (in press) noted that field experiments in policing inevitably suffer from an intent-to-treat problem, and they encouraged researchers to investigate issues with treatment fidelity in BWC experiments.

Last, we examined one medium-sized department in the northwestern United States, and the external validity of the results may be limited. In some ways, Spokane and its police department are similar to other jurisdictions in the United States. SPD is a medium-sized agency with a mostly White patrol force (Reaves, 2015b). SPD deployed BWCs in 2015 along with thousands of other police departments across the country (White, 2014). Nevertheless, the unique local conditions in each jurisdiction are likely to influence the adoption of BWCs, the prevalence of depolicing (or not; Wolfe and Nix, 2016), and the interplay between the two. Variation in both local context and BWC deployment are critically important factors for assessing depolicing potential, and future studies should be aimed at capturing those variables to assess their effect on the phenomenon.

CONCLUSION

The existence of a crisis-driven depolicing phenomenon remains hotly contested. We did not weigh in on this more general debate. Rather, we sought to test whether BWCs could be a source of depolicing through camera-induced passivity. We failed to find evidence of statistically significant camera-induced passivity in each of the four outcomes examined in Spokane. In fact, officers assigned to treatment actually increased their self-initiated activity during the RCT compared with control-assigned officers. This is not the final word on the matter, of course, but the results presented here provide a foundation for future inquiry into the potential for BWCs to be a source of depolicing.

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15. Call type, in particular, would have been a useful control. Call type is conflated, however, with several variables, most notably with response time, how the contact occurs (e.g., officer initiated), and contamination (i.e., certain calls would likely result in more officers being present). It is for these reasons that call type is excluded.

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