



# Evaluating the impact of police officer body-worn cameras (BWCs) on response-to-resistance and serious external complaints: Evidence from the Orlando police department (OPD) experience utilizing a randomized controlled experiment



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## ABSTRACT

**Purpose:** To evaluate the effect of police body-worn cameras (BWCs) on officers' response-to-resistance (R2R) incidents and serious external complaints.

**Methods:** A randomized experiment was used where 46 officers were randomly assigned to wear BWCs and 43 officers were randomly assigned to not wear BWCs. Pre- and post-BWC implementation outcome data was compared both between and within groups.

**Results:** The results suggest that BWCs are an effective tool to reduce R2R incidents and serious external complaints. Specifically, the prevalence of R2R incidents and the prevalence and frequency of serious external complaints were significantly less for officers randomly assigned to wear BWCs. Pre-post comparisons within groups demonstrated that the reduction in the prevalence of R2R incidents (53.4% reduction) and external complaints (65.4% reduction) were statistically significant for the officers who wore the BWCs, and significant reductions in the frequency of these outcomes were detected as well. Overwhelming agreement was also found among officers who wore the BWCs for the utility of BWCs to improve evidence collection and report writing and improve their behavior and police work in general by having the opportunity to review their own BWC videos.

**Conclusions:** Police departments would be prudent to consider adopting these devices in their agencies.

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## 1. Introduction

Recent state-level court proceedings on the impact of law enforcement procedures (i.e. New York's "Stop and Frisk") have thrust into national attention numerous issues surrounding police accountability and community relations (Floyd et al. vs City of New York et al., 2013). The NY court rulings have initiated discussions on novel policy recommendations to address legal and ethical responsibilities of officers and civilians alike. Specifically, the use of body-worn cameras (BWCs) on police officers has been recommended to help address liability from a purely objective "point of view" (Floyd et al. vs City of New York et al., 2013). Other more recent and tragic high profile events have also put the discussion and implementation of police BWCs in the forefront such as the Michael Brown incident in Ferguson, Missouri and the Eric Garner incident in New York City (Jennings, Fridell, & Lynch, 2014).

Although problematic issues in policing and technological advancements in policing are not necessarily anything new (Blackwell & Vaughn, 2003; Culver, 2004; Kowalski & Lundman, 2007; McElvain & Kposowa, 2004; PERF, 2012; Phillips & Varano, 2008; Weir, Stewart, & Morris, 2012; Weitzer, 2002; Zhao, Lovrich, & Robinson, 2001; Zhao, Ren, & Lovrich, 2010), the national discourse and public sentiment tends to favor the implementation of BWCs as a method to increase officer accountability and reduce an array of negative outcomes that may result from a police-citizen encounter. Furthermore, while prior research has documented the utility of technological innovations in policing such as GPS monitoring devices, (Hughes & Burton, 2014), in-car cameras (IACP, 2003), and closed circuit television (CCTV) cameras (Surette, 2005; Menichelli, 2014), there was not nearly the level of public and media scrutiny and attention directed toward these innovations as there currently exists with regard to police BWCs. Interestingly enough, media and anecdotal evidence seems to suggest that both sides (the police and the citizens) largely agree that these devices should be implemented in policing. In fact, current President Barack Obama has been vocal in his support of this technology and recently

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announced his proposal to invest \$75 million over the next three years to purchase 50,000 BWCs for law enforcement agencies.

Despite all of this attention and support, limited to no academic research has been conducted on the impact of BWCs on police and citizen behavior (Ariel, Farrar, & Sutherland, 2014; Drover & Ariel, 2015; IACP, 2003; Jennings et al., 2014; Ready & Young, 2015; White, 2014). As such, research is needed to evaluate the extent to which police BWCs achieve their proposed goals because 1) the implementation of BWCs require financial resources to acquire, implement, and maintain and expand services over time, and 2) “evidence-based” outcomes derived from rigorous research designs and randomized experiments are the “gold standard” to inform effective law enforcement policies and practice in general and as they relate to BWCs specifically.

Having said this, it is important to briefly review the prior BWC evaluation research that has been conducted thus far. For example, Ready and Young (2015) relied on data from a field experiment originally conducted by the Mesa Police Department (MPD) in Mesa, Arizona where officers were equipped with Taser’s Axon Flex BWCs. As part of an extension of MPD’s BWC evaluation, Ready and Young used quasi-experimental data from 50 officers who were assigned to wear BWCs and 50 officers who represented a matched control group. Several noteworthy findings from this study were as follows: 1) BWC officers conducted significantly fewer stop-and-frisks and arrests; 2) BWC officers issued significantly more citations for ordinance violations; 3) BWC officers initiated significantly more contacts with citizens; and 4) BWC officers reported that having the BWCs were helpful in police-citizen encounters.

Ariel et al. (2014) provided a randomized, controlled trial evaluation of BWCs with the Rialto Police Department (RPD) in Rialto, California where they randomly assigned all officers to “experimental shifts” where they wore BWCs and to “control shifts” where they did not wear the BWCs. Based on data collected from all 54 Rialto police officers, their results suggested that the likelihood of using force in the “control shifts” was twice as great as the likelihood of using force in the “experimental shifts”. Furthermore, pre-post analyses revealed that the number of complaints against officers declined as well from 0.7 complaints per 1000 contacts to 0.07 complaints per 1000 contacts. Most recently, Drover and Ariel (2015) reported their work thus far with a replication attempt of the Rialto study with 43 officers in West Midlands Police Force in Wolverhampton, United Kingdom. This study is utilizing a similar research design as the Ariel et al. (2014) study by randomizing shifts rather than subjects, and the results reported in the Drover and Ariel (2015) study focuses on an implementation evaluation with an outcome evaluation expected to be forthcoming in the future.

### 1.1. The current study

In recognition of the issues raised previously and in light of the limited scientific evidence, the current study seeks to address the following three primary research questions: 1) “Do police officers randomly assigned to wear BWCs differ from officers not randomly assigned to wear BWCs in response-to-resistance (R2R) incidents and serious external (citizen-generated) complaints at 12 month follow-up?”; 2) “Are there significant differences in these outcomes *within* groups in the 12 months prior to implementation of BWCs compared to the 12 months post-implementation of BWCs?”; and 3) “What are the attitudes and perceptions of officers who wore BWCs post-implementation of BWCs at 12 month follow-up?”

## 2. Methods

### 2.1. Random assignment of participants

Our study relied on the “gold standard” in experimental research designs (Farrington & Welsh, 2005; Sampson, 2010; Sherman & Berk, 1984) by focusing on how officers randomly assigned to wear BWCs compare to a control group of officers not randomly assigned to wear BWCs. As such, the first step in this process was to identify the

geographic areas in the city of Orlando that corresponded to the seven police districts (sectors) as defined by the Orlando Police Department (OPD).

After the geographic areas/police sectors had been identified, OPD officers were invited to serve as participants from all of these areas.<sup>1</sup> Following this recruitment procedure, the research team arrived at a list of the officers (within the seven geographic areas) who were willing to be study subjects. Informed consent was then obtained through appropriate University of South Florida (USF) Institutional Review Board (IRB) protocols. Next, approximately half of the volunteer study subjects were randomly assigned to either the BWC experimental condition ( $n = 46$ ) or the no-BWC control condition ( $n = 43$ ). This stratified random sampling across the seven police sectors was done in order to ensure geographic representation across the jurisdiction of the OPD and to reduce the likelihood of contamination such as when an officer with a BWC was on scene with an officer without a BWC (Shadish, Cook, & Campbell, 2002) (e.g., officers were randomly assigned within each stratum/geographic area/police sector). All officers randomly assigned to wear BWCs in this study were equipped with Taser AXON Flex body-worn cameras (<http://www.taser.com/products/on-officer-video/axon-flex-on-officer-video>).

### 2.2. Officer surveys

Another component of the evaluation examined attitudes and perceptions of officers who wore BWCs post-BWC implementation at 12 month follow-up. This part of the study involved the administration of surveys to the officers at 12 month follow-up (March 2015). These surveys were administered online (via Qualtrics Survey Program) and took approximately 30 minutes to complete. Response rates were 84.8% (39 out of 46 BWC study participants) at the 12 month post-BWC implementation survey.

### 2.3. Official data

Official data was provided by the OPD and included officer demographic characteristics (gender, race, age, and years of experience), response-to-resistance (R2R) incidents (e.g., any incident where an electronic control device or ECD, chemical agent, impact weapon, tackle/takedown, strike, etc. is used a response-to-resistance incident form is filled out on the officer involved), and serious external (citizen-generated) complaints (e.g., aggressive, threatening, and/or intimidating officer behavior and/or excessive use-of-force) for each of the study participants in the 12 months pre-BWC implementation and in the 12 months post-BWC implementation.

### 2.4. Sample descriptives

Officer demographics for the entire sample of officers ( $n = 89$ ) can be found in Table 1. As can be seen, the majority of the study participants were male (87.6%) and White (88.6%), and the officers, on average, were 35.10 ( $SD = 8.03$ ) years of age and had an average of 6.46 ( $SD = 5.06$ ) years of prior law enforcement experience.

### 2.5. Analytic strategy

The analysis proceeds in several stages. In the first stage, statistical ( $t$ -test) comparisons for officer demographics (e.g., gender, race, age, and years of experience) and for the outcomes of interest (e.g., the frequency and prevalence of response-to-resistance incidents and serious external complaints measured in the 12 months pre-BWC implementation) are made between the officers randomly assigned to wear BWCs and the officers randomly assigned not to wear the BWCs. This analysis is necessary to evaluate the robustness of the random assignment in equating officers in the two groups and eliminating any pre-existing differences. Stage 2 involves a series of  $t$ -test comparisons of the frequency and prevalence of response-to-resistance incidents and serious external

**Table 1**  
Total Sample Demographics and Pre-Implementation (March 1, 2013–February 28, 2014) and Post-Implementation (March 1, 2014–February 28, 2015) of Body-Worn Cameras Between Group Demographic and Outcome Comparisons between OPD Study Participants Randomly Assigned to the Body-Worn Camera (experimental) condition and the No-Body-Worn Camera (control) condition

	Total Sample (n = 89)	Pre-Implementation BWC (Experimental) Condition (n = 46)	Pre-Implementation No-BWC (Control) Condition (n = 43)	Post-Implementation BWC (Experimental) Condition (n = 46)	Post-Implementation No-BWC (Control) Condition (n = 43)
	Mean/% (SD)	Mean/% (SD)	Mean/% (SD)	Mean/% (SD)	Mean/% (SD)
Gender (1 = Female)	12.40%	13.00%	12.00%	–	–
White (1 = White)	88.60%	91.10%	86.05%	–	–
Age	35.10 (8.03)	35.47 (8.56)	34.71 (7.49)	–	–
Years of Experience	6.46 (5.06)	6.97 (5.15)	5.93 (4.98)	–	–
Response-to-Resistance (total #)		3.50 (3.89)	3.51 (5.67)	1.63 (2.41)	2.19 (3.16)
Response-to-Resistance (prevalence/%)		78.26%	69.77%	<b>56.52%*</b>	<b>72.09%</b>
Serious External Complaints (total #)		0.26 (0.65)	0.30 (0.74)	<b>0.09 (0.28)*</b>	<b>0.19 (0.39)</b>
Serious External Complaints (prevalence/%)		17.39%	16.28%	<b>8.70%*</b>	<b>18.60%</b>

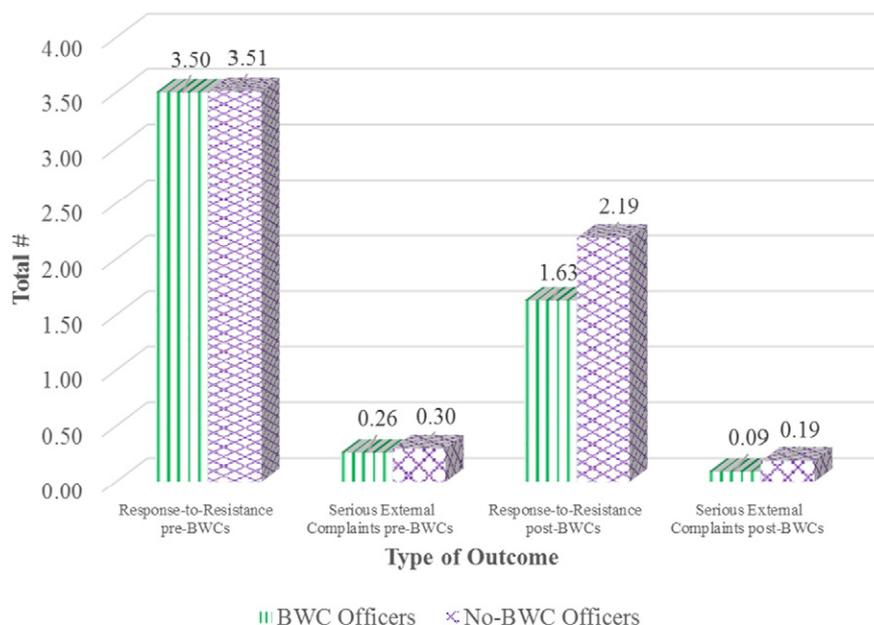
Note. BWC = Body-Worn Camera. Statistically significant between group differences are denoted in bold italics.

\* p < .10 (one-tailed).

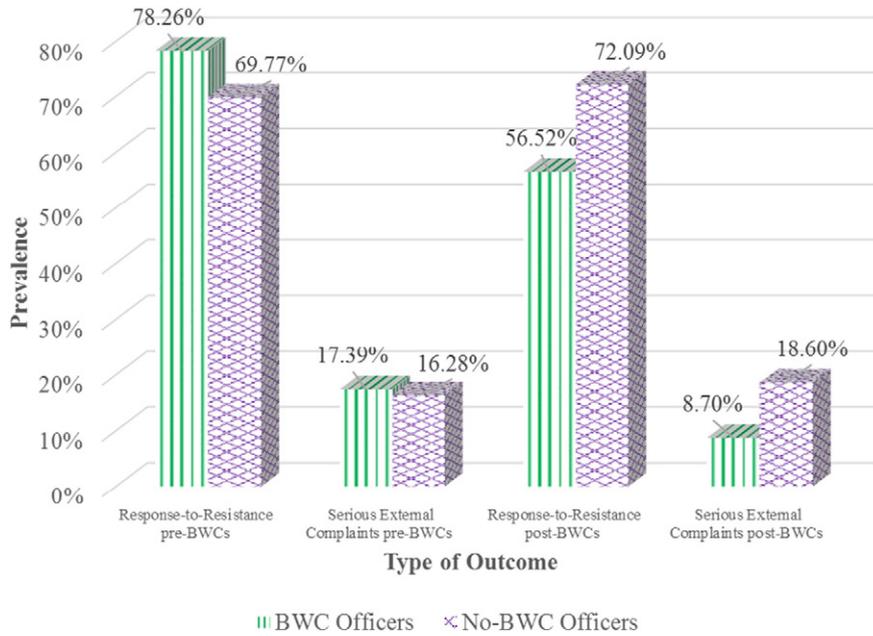
complaints between the BWC officers and the no-BWC officers in the 12 months post-BWC implementation. In the final stage of the analysis, *t*-test comparisons are made within groups to ascertain whether or not any reduction (or increase) observed in response-to-resistance incidents and serious external complaints were statistically significant from pre-BWC implementation to post-BWC implementation. It is important to note here that in order to be consistent with the recommendation in the medical, statistical, and criminological literature when evaluating treatment effects (Bland & Altman, 1994; Dunnett and Gent, 1996; Enkin, 1994; Fisher, 1991; Piquero, Farrington, Welsh, Tremblay, & Jennings, 2009; Piquero, Jennings, & Farrington, 2010) and the prior BWC evaluations suggesting the direction of the hypothesized effect of BWCs (Ariel et al., 2014; Drover & Ariel, 2015; Ready & Young, 2015), we relied on one-tailed statistical tests. In addition, as is common in the experimental literature when analyzing data from experiments with smaller sample sizes, we relied on alpha values of both 0.10 and 0.05 (Piquero et al., 2009, 2010).

### 3. Results

Table 1 presents the pre-BWC implementation demographic comparisons as well as the comparisons across the main outcomes of interest including the frequency and prevalence of response-to-resistance (R2R) incidents and serious external (citizen-generated) complaints (e.g., aggressive, threatening, and/or intimidating officer behavior and/or excessive use-of-force) in the 12 months prior to BWC implementation (March 1, 2013–February 28, 2014). As illustrated through the estimation of a series of *t*-tests, none of the demographic comparisons or comparisons on the host of outcomes revealed any statistically significant differences between the BWC (experimental) group (n = 46) and the no-BWC (control) group (n = 43). This was to be expected given the utilization of randomization in assigning participants to the experimental or control group, but it nonetheless also confirms that there are no pre-existing group differences in officer demographics or on the outcomes of interest prior to BWC implementation. Figs. 1 and 2 also visually present the pre-BWC implementation outcome



**Fig. 1.** Pre-implementation (March 1, 2013–February 28, 2014) and Post-implementation (March 1, 2014–February 28, 2015) of Body-Worn Cameras Between Group Outcome Frequency Comparisons between OPD Study Participants Randomly Assigned to the Body-Worn Camera (experimental) condition and the No-Body-Worn Camera (control) condition.



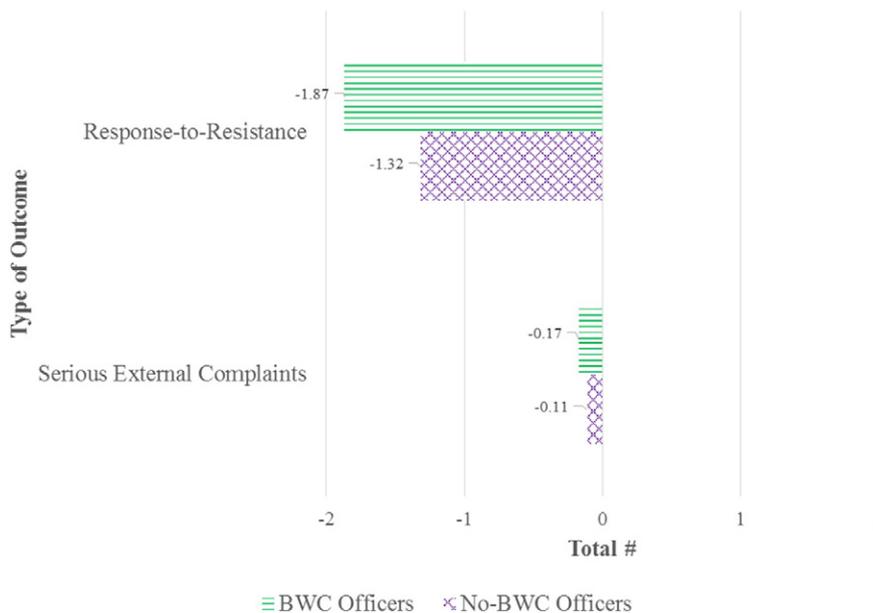
**Fig. 2.** Pre-implementation (March 1, 2013–February 28, 2014) and Post-implementation (March 1, 2014–February 28, 2015) of Body-Worn Cameras Between Group Outcome Prevalence Comparisons between OPD Study Participants Randomly Assigned to the Body-Worn Camera (experimental) condition and the No-Body-Worn Camera (control) condition.

comparisons between the BWC group and the no-BWC group in terms of frequency and prevalence comparisons, respectively.

Table 1 (and Figs. 1 and 2) also provides the post-BWC implementation *t*-test comparisons on these same outcomes {frequency and prevalence of response-to-resistance (R2R) incidents and external (citizen-generated) complaints (e.g., aggressive, threatening, and/or intimidating officer behavior and/or excessive use-of-force)} in the 12 months post-implementation of BWCs (March 1, 2014–February 28, 2015). What is readily apparent is that the two groups statistically differ on the main outcomes of interest. Specifically, officers randomly assigned to wear BWCs had a significantly lower prevalence of R2R incidents, accumulated a significantly lesser number of serious external complaints, and had a significantly lower prevalence of serious external

complaints in the 12 months post-BWC implementation relative to the officers who were not randomly assigned to wear BWCs.

Moving beyond these significant between-group comparison differences, it is also necessary to assess within-group change on these outcomes for the BWC and no-BWC officers in the 12 months pre-BWC implementation (March 1, 2013–February 28, 2014) compared to their outcome data based on the 12 months post-BWC implementation (March 1, 2014–February 28, 2015) (see Figs. 3 and 4). These specific *t*-test comparisons can be found in Table 2. The results suggest that the reduction in the total number of R2Rs from pre- to post-BWC implementation was statistically significant for both the BWC and the no-BWC groups (although the reduction overall was greater for the BWC group). However, more importantly, the reduction in the prevalence



**Fig. 3.** Pre- (March 1, 2013–February 28, 2014) and Post- (March 1, 2014–February 28, 2015) Implementation of Body-Worn Cameras Within Group Change in Outcome Frequency for OPD Study Participants Randomly Assigned to the Body-Worn Camera (experimental) condition and the No-Body-Worn Camera (control) condition.



**Fig. 4.** Pre- (March 1, 2013–February 28, 2014) and Post- (March 1, 2014–February 28, 2015) Implementation of Body-Worn Cameras *Within Group Change* in Outcome Prevalence for OPD Study Participants Randomly Assigned to the Body-Worn Camera (experimental) condition and the No-Body-Worn Camera (control) condition.

of BWC officers who were involved in R2R incidents also significantly declined from pre- to post-BWC implementation. In addition, BWC officers also generated significantly fewer serious external complaints and fewer BWC officers were subjects of serious external complaints in the 12 months post-BWC implementation compared to their frequency and prevalence prior to BWC implementation.

Table 3 presents the results of the post-BWC implementation 12 month follow-up survey conducted with the BWC (experimental) group study participants. At 12 month follow-up, nearly three out of four officers strongly agreed or agreed that they think their agency should adopt BWCs for all front-line officers. Slightly more than one in four officers also reported agreement that the implementation of BWCs has directly impacted their behavior in the community as well as the behavior of the citizens in the community. In contrast, greater than 40% reported agreement that BWCs are capable of de-escalating confrontations with citizens in the community and have impacted the behavior of their fellow officers in the community. Noticeably positive endorsements were also reported regarding the officers' perceptions on the capability of BWCs to improve their evidence collection (84.6% reported agreement), improve their recollection of events (92.3% reported agreement), and minimize errors in the reports they submit

(79.5% reported agreement). Relatedly, a great majority of officers reported believing that reviewing BWC video after an incident would help them become a better police officer (69.2% reported agreement), would help them identify ways to improve their interactions with citizens (64.1% reported agreement), and would help them identify issues that they may need improvement on (79.5% reported agreement).

**Table 2**  
Pre- (March 1, 2013–February 28, 2014) and Post- (March 1, 2014–February 28, 2015) Implementation of Body-Worn Cameras *Within Group Change* in Outcomes for OPD Study Participants Randomly Assigned to the Body-Worn Camera (experimental) condition and the No-Body-Worn Camera (control) condition

	BWC (Experimental) Condition (n = 46) Pre-Post	No-BWC (Control) Condition (n = 43) Pre-Post
	Mean/% Change (SD)	Mean/% Change (SD)
Response-to-Resistance (total #)	(-) <b>1.87** (3.03)</b>	(-) <b>1.32** (3.95)</b>
Response-to-Resistance (prevalence/%)	(-) <b>21.74%**</b>	(+) 2.33%
Serious External Complaints (total #)	(-) <b>0.17** (0.64)</b>	(-) 0.11 (0.91)
Serious External Complaints (prevalence/%)	(-) <b>8.70%**</b>	(+) 2.33%

Note. BWC = Body-Worn Camera. Statistically significant pre-post *within group* differences are denoted in bold italics.

\* p < .10 (one-tailed).  
\*\* p < .05

**Table 3**  
OPD BWC (Experimental) Condition Study Participants' Perceptions of Body-Worn Cameras Post-Implementation at 12 Month Follow-Up

	Mean (SD)	Percent (%) Agree or strongly agree
Agency should adopt BWCs for all front-line police officers.	2.05 (1.08)	74.4%
The implementation of BWCs has directly impacted my behavior in the community.	3.33 (1.22)	25.6%
The implementation of BWCs has impacted the behavior of citizens I have encountered in the community.	3.15 (1.16)	28.2%
BWCs are capable of de-escalating confrontations with citizens I encounter in the community.	2.92 (1.22)	41.0%
The implementation of BWCs has impacted the behavior of other officers in the community.	2.79 (0.89)	41.0%
BWCs are capable of improving my evidence collection.	1.92 (0.77)	84.6%
BWCs are capable of improving my recollection of events.	1.67 (0.70)	92.3%
BWCs are capable of minimizing errors in the reports I submit.	2.00 (0.95)	79.5%
Reviewing BWC video after an incident help me become a better police officer.	2.31 (0.92)	69.2%
Reviewing BWC video after an incident help me identify ways to improve interactions with citizens.	2.38 (0.94)	64.1%
Reviewing BWC video after an incident help me identify issues I may need improvement on.	2.15 (0.67)	79.5%
Once the research study is complete I would like to wear a BWC.	2.15 (1.14)	66.7%
Agency was effective in the implementation of BWCs.	2.00 (0.56)	84.6%

Note. BWC = Body-Worn Camera. All variables coded as: 1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree, 5 = strongly disagree.

#### 4. Discussion

The current study offered a methodologically rigorous, randomized experiment evaluating the effectiveness of BWCs in law enforcement. A number of noteworthy findings emerged from this effort and are summarized here. For example, no statistically significant pre-existing differences (demographics or outcomes of interest) were observed between the BWC and the no-BWC group at pre-BWC implementation, which speaks to the success of the random assignment procedure. In contrast, at post-BWC implementation, significantly fewer BWC officers were involved in response-to-resistance (R2R) incidents and had less external complaints overall and fewer were subjects of external complaints relative to officers not wearing a BWC. Furthermore, BWC and no-BWC officers had fewer R2R incidents (although the total number of R2R incidents was lower for the BWC officers) when comparing outcomes within groups at 12 months pre-BWC implementation to 12 months post-BWC implementation. In addition, the number of BWC and no-BWC officers involved in R2R incidents also significantly declined as did the total number and prevalence of serious external complaints when comparing the outcomes at 12 months pre-BWC implementation to 12 months post-BWC implementation for the BWC officers, specifically. The former finding is particularly interesting as it seems to point to an ancillary or perhaps an unintended benefit for BWCs that can extend beyond the officers that are actually wearing the BWCs. In other words, it is quite possible that because the no-BWC officers were aware that their police department was engaging in a study of BWCs in order to determine whether or not these devices were effective in reducing negative outcomes, such as response-to-resistance, that all officers in the police department tended to “toe-the-line” a little more when interacting with citizens and suspects due to the perceived increased scrutiny of their behavior in the field in general (even if it was technically occurring “off-camera” for the no-BWC officers).

Comparatively, a series of intriguing findings also were obtained from the post-BWC implementation surveys from the officers who were randomly assigned to wear BWCs. In this vein, the noticeable majority of officers were in agreement that their agency should adopt BWCs for all front-line officers. Approximately, one in four officers reported agreement that the wearing of a BWC has impacted their behavior in the field, and 30–40% of officers were in agreement that BWCs had impacted citizen behavior, de-escalated confrontations with citizens and themselves in the community, and had impacted the behavior of their fellow officers. Also, by and large, the officers overwhelmingly reported agreement that BWCs are capable of improving their evidence collection and their recollection of events, minimizing errors in their reports, and that reviewing BWC video after an incident would help them become a better officer, identify ways to improve interactions with citizens, and identify issues in general that they may need to improve on. Finally, two out of every three officers who wore a BWC reported that they would want to continue wearing one upon study completion, and nearly 85% of officers were in agreement that OPD was effective in its implementation of BWCs.

It is necessary to tie our results back to the limited, but important, prior BWC extant literature that exists to contextualize our findings. In this vein, our results are consistent with those provided in [Ready and Young's \(2015\)](#) quasi-experimental BWC evaluation with 100 police officers in the Mesa Police Department in Mesa, Arizona in that we also found that the officers reported many benefits of wearing the BWCs and found them to be helpful during police-citizen encounters. Similarly, our results regarding the statistically significant reductions that were observed in response-to-resistance and external complaints are also consistent with those reported by [Ariel et al. \(2014\)](#) who randomized police shifts into BWC and no-BWC shifts for all of the 54 officers in the Rialto Police Department in Rialto, California. Therefore, it appears that the evidence from quasi-experimental studies ([Ready & Young, 2015](#)) and studies that have randomized police shifts ([Ariel et al.,](#)

[2014](#)) are largely in line with our results generated from randomly assigning officers to wear BWCs.

These positive and comparative results notwithstanding, we would be remiss to not acknowledge several limitations with this study. First, the site for this randomized experiment was a large metropolitan police department, and thus the extent to which these findings may apply to smaller police departments and/or police departments in more rural areas is unknown. Second, while the two outcomes in this study are the main outcomes that are often the largest concerns among police departments, citizens, and the media, there are a host of other outcomes that may indeed be relevant for future empirical inquiry such as internal complaints, officer injuries, suspect injuries, etc. Third, future research may wish to attempt to disaggregate response-to-resistance incidents by type (e.g., Taser, physical take down, physical striking, chemical agent, firearm, etc.) to assess the extent to which BWCs may have different effects on response-to-resistance methods employed. Fourth, it is unknown the extent to which a selection bias may exist due to the recruitment of volunteer officers for the study. Although this volunteer recruitment strategy is obviously the only ethical strategy as we as academics cannot force officers to wear the BWCs, there is always the possibility that volunteers for a study may not “look” exactly like those who did not volunteer for the study. However, it is worth reiterating here that all of the officers in this study volunteered to be in the study without knowing which condition they would be randomly be assigned to, or in other words they did not know if they would be wearing a BWC or not. Fifth, while prior BWC evaluation research ([Ariel et al., 2014](#); [Drover & Ariel, 2015](#); [Ready & Young, 2015](#)) has tallied the number of police-citizen contacts that occur during the study period, unfortunately, we/OPD did not tally the number of police-citizen contacts that occurred for the study officers during the 12 months of this study, so we are unable to comment on the frequency of police-citizen contacts in general during the study period between the OPD and its citizens. Nonetheless, we presume it to be comparable to the number of police-citizen contacts among other similarly-sized large metropolitan police departments. Finally, the results from this study were derived from a small sample size (<100), so caution should be taken when interpreting the results. However, the fact that significant results were obtained from this sample size may lend more credence to the presence of particularly substantive differences as is in general it is more difficult to detect statistically significant effects with smaller sample sizes due to less statistical power.

Taken together, the results from this methodologically rigorous, randomized experiment all point toward the effectiveness of BWCs for improving police-community relations and reducing a host of tragic events that can result from negative police-citizen encounters. This is indeed encouraging evidence as now we have science to back the media and anecdotal evidence to demonstrate that BWCs are indeed a useful technological tool. In light of this scientific evidence, police departments in the United States (as well as around the world) would be prudent to strongly consider adopting these devices in their agencies. Sure, the up-front costs of purchasing the equipment and the on-going maintenance costs are a valid concern and a considerable expense, but the evidence revealed from this research seems to suggest that the significant reduction in response-to-resistance incidents and serious external complaints make the events that often lead to lawsuits decline as well not to mention less opportunities for officer and suspect injuries. Ultimately, BWCs likely provide law enforcement with the best “bang for the buck” (no pun intended), and we encourage police departments to consider ways that they may be able to secure or reallocate existing resources to implement this technology.

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our own and do not necessarily represent or reflect those of the OPD, its' Administration, or their officers. We also would like to thank the anonymous peer reviewers for their excellent set of comments and suggestions that greatly improved the manuscript.

## Note

<sup>1</sup> Due to the novelty of BWCs at the time of study implementation, the costs of the BWCs, and OPD's and the research team's preference for a smaller scale study rather than a full scale implementation, the sample size for the study was pre-determined to be approximately 100 officers total, representing approximately 25% of OPD's entire patrol force.

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