

# The body-worn camera perspective bias

Rémi Boivin<sup>1</sup> · Annie Gendron<sup>2</sup> · Camille Faubert<sup>1</sup> ·  
Bruno Poulin<sup>2</sup>

Published online: 4 August 2016

© Springer Science+Business Media Dordrecht 2016

## Abstract

*Objectives* Footage from body-worn cameras (BWCs) is sometimes used to assess the quality of police interventions. This study investigates whether there is a “body-worn camera perspective bias,” in which the point of view provided by the footage influences perception of an intervention.

*Methods* Participants with different backgrounds (undergraduate students and police candidates) were randomly allocated to a group that looked at one of two videos showing a fictional police intervention during which lethal force was used against a subject; both videos showed exactly the same intervention, but one had been filmed with a BWC and the other with a surveillance camera installed in a top corner of the room. Participants were then asked to rate the appropriateness of the intervention.

*Results* No camera perspective bias was found among university respondents. However a significant camera perspective bias was found among police candidates: respondents’ opinions on the appropriateness of the intervention were significantly different when the film was from the body-worn camera than when it was seen from the surveillance camera. This result may be explained by the finding that viewers of the BWC footage reported that the subject was further from the officer.

*Conclusions* Results suggest that the more training individuals have in analyzing police interventions, the more affected they will be by the camera perspective in these interventions. One implication of these results is that the perspective of people assigned and trained to evaluate the appropriateness of an intervention (e.g., members of a committee monitoring police misconduct) might be biased if only video footage from a BWC is presented.

---

✉ Rémi Boivin  
remi.boivin@umontreal.ca

<sup>1</sup> School of Criminology, International Centre for Comparative Criminology, Université de Montréal, C.P. 6128, succursale Centre-ville, Montréal, QC H3C 3J7, Canada

<sup>2</sup> International Centre for Comparative Criminology, École nationale de police du Québec (Police Academy), Nicolet, QC J3T 1X4, Canada

**Keywords** Body-worn cameras · Use-of-force · On-officer video cameras · Perspective bias · Police · Distance perception

## Introduction

A body-worn camera (BWC) is a device intended to capture and record police encounters. Usually located on the front of an officer's shirt, on his/her shoulder, or mounted on his/her glasses, it is designed to provide a "first-person" perspective on interventions and create a potentially permanent digital video recording of police encounters. BWCs are often presented as an invaluable tool for police organizations and are expected to increase accountability and transparency, as well as protecting officers against unfounded complaints and physical assaults; in recent years, BWCs have been adopted by police organizations throughout the world at an extremely rapid pace. According to the most recent release of the Bureau of Justice Statistics, in 2013 approximately 3,900 local police departments in the United States (32 %) used BWCs (Reaves 2015). The current number of BWCs in the U.S. is probably even larger, because in 2015 the Obama administration announced it was making a large investment in equipment acquisition by law enforcement organizations. Similar statistics are not available for Canada and other countries, but it seems reasonable to assume that the proportion of BWCs has been increasing in recent years as well.

It is, however, important to investigate how useful the footage provided by BWCs actually is, as their use has many practical implications. For example, BWCs do not record continually and must be manually activated by the officer. Some officers may be reluctant and/or forget to activate their BWC, despite strict procedural guidelines (Katz et al. 2015). The digital archiving of footage is another issue for which there are currently no agreed upon standards: which images must be archived, and for how long, is largely defined by local policymakers. Some police organizations maintain a selection of "evidential" clips for future use (Grossmith et al. 2015), while others delete all recordings after a given period. Officers must be made aware of the possible future importance of the footage, and organizations should adopt policies to help not only record but file meaningful footage. While there is an increasing body of empirical research on the impact of body-worn cameras on the behavior and perceptions of those who are involved in the filmed intervention (Lum et al. 2015), much less is known about how BWC footage might affect the assessment of police interventions by courts and, more generally, by the public. This study investigates whether there is a "body-worn camera perspective bias" that might influence perception of an intervention.

## Body-worn camera research

A research team from the Center for Evidence-Based Crime Policy at George Mason University recently published a systematic review of existing and ongoing research knowledge relevant to BWCs as they have been used by both law enforcement and the courts (Lum et al. 2015: 5). They note that "almost all existing and ongoing BWC research is occurring in the arena of law enforcement" and involves research questions such as "do BWCs change officer and/or citizen behavior?"; "what do officers think

about BWCs?"; or "what is the impact of implementing these cameras on citizen complaints?"

BWCs are presented as a general deterrence stimulus that is likely to affect the behavior of those involved in a filmed police intervention because they encourage both self-awareness as well as some evaluation of the social desirability of the actions being carried out. Ideally, police officers should behave according to professional norms, and citizens are expected, to a certain extent, to comply with social rules of conduct, which include obeying orders given by a police officer. BWCs may also be seen as increasing the risk (or perception of risk) of apprehension and conviction, thus leading potential rule-breakers to behave in order to avoid criminal actions (Ariel et al. 2016). Although the number of studies on BWCs remains small, empirical evidence suggests that both aspects of their use are supported: there is evidence that officers carrying a BWC report fewer incidents of police use-of-force (Ariel et al. 2015; Jennings et al. 2015), are more likely to perform proactive activities such as giving citations and initiating encounters (Ready and Young 2015), and are the subject of fewer citizen/external complaints (Grossmith et al. 2015; Jennings et al. 2015; Katz et al. 2015). Researchers also found that officers are generally supportive of the use of BWCs in policing, usually because they believe cameras will improve citizen behavior (Jennings et al. 2014). Few officers admit that wearing a camera might improve their own behavior, but they report that cameras are helpful in situations where they issue a warning or citation, perform a stop-and-frisk, or make an arrest (Jennings et al. 2014; Ready and Young 2015).

This approach, while by far the most prominent in research dealing with BWCs, is concerned only with the impact of the camera itself rather than with the film that it provides. However, as noted by Lum et al. (2015), film from BWCs may be used to improve investigations and aid in resolving crimes, to improve police education (if cameras are used for training purposes), as evidence in court cases, and to influence assessments of factual questions such as "was the use-of-force reasonable in a given situation?"

## The camera perspective bias

Recent technological advances in video cameras allowed development of the BWCs that are now being worn routinely by police officers; as these developments are recent, the impact of film footage on the judicial process is not yet fully understood. Any research on the availability of such footage and the effect of camera perspective comes from studies using films of traffic interventions taken with dashboard cameras (Kahan et al. 2009) and films of suspect interrogations (e.g., Lassiter and Irvine 1986). This research suggests that there might be a "camera perspective bias" that affects decisions about the activities shown, providing a reminder that camera angles can be used to manipulate viewers' perceptions and opinions (Mandell and Shaw 1973).

This research, although not directly involving BWCs, provides empirical evidence that can be applied to their use, for at least two reasons. First, the arguments for videotaping interrogations and traffic interventions are similar to those used to endorse the use of BWCs: as noted by Lassiter et al. (2001: 195), early advocates of videotaped confessions argued that the presence of a camera in the room would "1) deter the use of coercive methods to induce confessions, and 2) provide a more complete and objective

record of the interrogation.” Similarly, there were two major goals behind implementing dashboard cameras in the USA: the enhancement of officer safety (due in part to discouraging arrestee assault) and the prevention of racial profiling/inappropriate behavior by police (IACP 2005). Second, the film from BWCs is, like that of traffic interventions and interrogations, often shown to individuals who were not present when it was recorded (presiding judge, prosecutors, jurors, and other “trial fact finders”) but who still get to comment on the intervention — for example, if a confession was true or false, coerced or voluntary.

The discovery of a “camera perspective bias” in videotaped confessions is usually attributed to Lassiter and Irvine (1986). These researchers showed the same interrogation filmed from three points of view to participants, and asked them to rate the level of coercion/voluntariness of the confession. They found that respondents who viewed the film that focused on the suspect (the suspect was seen from a camera behind the detective’s shoulder) reported lower coercion than those who saw it from other perspectives (focus on the detective and equal focus on both subject and detective). They concluded that “the point of view from which a confession is videotaped can have a considerable impact on observers’ judgments of whether that confession was voluntary or coerced” (Lassiter and Irvine 1986: 272). This bias has been found repeatedly by Lassiter and his colleagues across various types of crimes (Lassiter et al. 1992), contexts (e.g., Lassiter et al. 2002a), and populations (Lassiter et al. 2007) and has been extended by other researchers to different types of confessions (e.g., journalistic; Landstrom et al. 2007), observer testimonies (child witnesses; Landstrom and Granhag 2008; automobile drivers; Hennessy and Jakubowski 2007), and in countries other than the USA (Korea; Park and Pyo 2012).

A well-known case illustrates how a videotape exhibit filmed from the police point of view may influence court decisions (*Scott vs Harris*, 550 U.S. 372 2007). In 2007, the U.S. Supreme Court released the dashboard camera video of a car chase that ended when a police officer rammed the suspect’s car, causing it to crash and leaving the suspect permanently paralyzed from the neck down. Both the District Court and the Court of Appeals had concluded previously that the suspect had not been a significant threat to pedestrians and other motorists, and thus that the police officers’ use of a maneuver with such a high risk of serious injury and death for the suspect was unreasonable. The Supreme Court overturned the decision and concluded in a clear majority (one dissent) that the suspect had obviously been dangerous to the public and that the ramming was reasonable. Many aspects of this decision provoked considerable debate, the most relevant for this paper being the fact that, despite the existence of a video recording of the car chase, judges from various courts disagreed about what they saw, calling into question whether a video can, in fact, “speak for itself.”

Kahan et al. (2009) looked further at the case, showing the car chase video to a diverse sample of 1,350 research participants who were instructed to look at it as if they were a juror deciding the case. They then gave their opinion (using a six-item scale from “strongly agree” to “strongly disagree”) on various aspects of what they had seen, including: “during the pursuit, the motorist drove in a manner that put members of the public and/or the police at great risk of death; the police should not have engaged in a high-speed chase; the police were much more at fault [than the motorist] for the risk posed to the public by the chase”; and whether the motorist’s driving constituted sufficient danger for the police and the public to justify the decision to end the chase

in a way that put the motorist's life in danger. They found that most respondents agreed with the Supreme Court's decision, but a significant portion of their sample reported opinions more in line with the initial decisions. More importantly, differences could be systematically linked with identifiable subgroups (e.g., African-Americans, low-income workers, residents of the Northeast).

Based on extensive research in social psychology, Lassiter and colleagues argue that camera perspective bias results from illusory causation, that is, the tendency to ascribe unwarranted causality to a stimulus because it is more salient or noticeable than other available stimuli (McArthur 1980). They suggest that suspect-focused videotaped confessions led people to judge that the confessions were more voluntary than other points of view simply because the suspect was more visible (Lassiter et al. 2002b). They also found evidence that illusory causation is a perception-based rather than a memory-based bias. In other words, the camera perspective influences what will be considered to be the most visually salient aspect of the video, and thus the information that is extracted. The bias occurs because of the perspective presented by the camera, not because of the perspective of the individual viewing it (see also Kraft 1987; Lassiter et al. 2002b; Ratcliff et al. 2006; Ware et al. 2008).

A considerable amount of empirical research thus supports the existence of a camera perspective bias in criminal justice. The issue is particularly concerning, since the bias appears to hold even when participants are allowed to deliberate before their assessment and are instructed to focus on the content of the interrogation and confession (Lassiter et al. 2002a). Recent evidence suggests that providing extensive instructions prior to the viewing may partially mitigate the effect of camera perspective on juror judgments (Elek et al. 2012), but experienced judges and law enforcement experts place great value on video evidence—and they are sensitive to camera perspective as well (Kahan et al. 2009; Lassiter et al. 2007). In short, the theory that a camera perspective bias affects the way videotaped interrogations by law enforcement are interpreted is robust and generalizable, although it has not provided a successful way to mitigate this bias (Lassiter et al. 2009). The possible contribution of camera perspective bias to wrongful conviction has been considered important enough that some academics recommend that all interrogations of suspects should be videotaped from a neutral camera angle (Kassin et al. 2010). Kahan et al. (2009) also suggest that a video recording of a police intervention may be interpreted in completely opposite ways by different people with different backgrounds and experiences.

## Current study

While not directly related to BWCs, the literature presented above has implications that could help identify problems that may develop as the use of BWCs increases. The existence of a camera perspective bias must be investigated before film from BWCs becomes routinely available to the public and/or is presented as evidence in criminal courts. Because video footage is often crucial in the assessment of controversial situations (IACP 2005), the potential consequences of biased judgment in terms of conviction and public opinion are significant. Furthermore, even those who are expected to provide the most objective assessments of an intervention might be subject to bias as well: evaluations made by experienced judges and law enforcement officers

of the voluntariness of a confession were sometimes significantly altered by camera perspective (Lassiter et al. 2007).

To our knowledge, the current study is the first to investigate the existence of a camera perspective bias related to BWCs. A body-worn camera perspective bias would be suggested if:

Hypothesis 1: Respondents who view footage taken from a body-worn camera perspective report significantly different opinions about the appropriateness of the intervention than those who view the same intervention from another camera perspective;

Hypothesis 2: Respondents who view footage taken from a body-worn camera perspective report significantly different opinions on the appropriateness of potential consequences than those who view the same intervention from another camera perspective.

Two experiments were conducted. In the first, whether a generalized bias exists was tested using a sample of students and employees from the Université de Montréal. The second experiment was conducted with police candidates completing their Basic Officer Training Program at the École nationale de police du Québec (Quebec's Police Academy) to see if respondents with some level of knowledge about policing and use of force would report opinions influenced by camera perspective. In both cases, respondents were randomly allocated to one of two videos showing a controversial police intervention during which lethal force was used against a subject; both versions showed exactly the same intervention but one was filmed with a BWC and the other with a surveillance camera installed in a top corner of the room. The aim was to see if the view of the scene provided by the BWC led to opinions that were significantly different from those about the incidents when seen from a more static point of view.

Two potential explanations of bias are then explored. As noted by Lassiter et al. (2002b), the theory of illusory causation suggests that a larger amount of meaningful information will be extracted from the video that provides the most visually salient information; participants were therefore asked to complete questionnaire items that measured their perception of details to see if BWCs differed from the other camera in this respect. Distance is a crucial factor in police use of force; for example, officers in most countries, including Canada, are trained to use their firearm against an assailant armed with a knife or another "edged" weapon if the subject is within a certain distance [e.g., the 21-foot rule; Tueller 2004 (1983)]. Respondents were asked to evaluate if the officer fired appropriately.

Hypothesis 3: Respondents who view footage from the body-worn camera perspective notice and retain a significantly different number of details than those who view the same intervention from another camera perspective;

Hypothesis 4: Respondents who view footage from the body-worn camera perspective have different perceptions of the distance between the officer and the individual involved than those who view the scene from a different camera perspective.

## Methods and procedure

An experiment was conducted in November and December 2015 at two sites. Participants viewed one of two videos of a fictional police intervention and then answered a computerized questionnaire composed of 17 multiple-choice items. The 35-second videos showed two police officers, called by a woman who was on-site, intervening with a man showing signs of a mental health crisis. After a few seconds, the man stands up, hits a television set with a baseball bat, and then turns to the officers, holding the baseball bat in the air in an obviously threatening manner; the intervention ends when one of the officers discharges his firearm, resulting in what appears to be a serious injury (the man falls to the ground and stops talking). Both videos were identical with one major difference: video A was recorded using a steady “surveillance” camera located in the top corner of the room while video B was filmed using a body-worn camera. As both versions were filmed separately (following strict guidelines), the body-worn camera was not visible in video A.

Six items asked subjects to rate the appropriateness of the intervention. The first item surveyed their general opinion: “In the context presented in the video, the intervention was excellent, satisfactory, questionable, or blameworthy.” Respondents then had to indicate their level of agreement or disagreement on separate 4-point scales (“strongly agree,” “somewhat agree,” “somewhat disagree,” or “strongly disagree”) for five statements:

- 1) Officers were justified in using force against the man.
- 2) Both officers should be promoted for their good work.
- 3) The level of force used in the intervention was adequate.
- 4) The officer who used his firearm against the man should receive a formal reprimand.
- 5) The officer who used his firearm against the man should be required to take additional training on use of force at the police academy.

Additional items investigated potential explanations. One was intended to measure distance perception: “In your opinion, the officer a) fired too late and put himself in danger; b) fired in a timely way; c) fired too early; d) should not have used his firearm during the intervention.” Three multiple-choice items intended to measure perception and retention of details (visual attention) asked respondents to report what the man had in his hands (a baseball bat), the color of his shirt (black), and what he was doing when the officers arrived on the scene (sitting on a couch). Other items asked general questions about the respondents: age, sex, highest diploma completed, and whether a relative or close friend is or has been a police officer. Respondents were allowed to watch the video only once and could answer the questions at their own pace; the whole process took approximately 10 minutes.

Respondents from the Université de Montréal (“the University”) were invited to participate in one of three data collection sessions through announcements made during classes, a post on the Facebook page of the authors’ research center, traditional posters displayed on the School of Criminology board, and solicitation of passers-by during the collection process. After a coin toss determined which version they would watch, volunteers ( $n = 231$ ), mostly undergraduate students, were brought to a lab dedicated



to this research where they sat in front of a computer equipped with a headset; instructions were first explained by a research assistant and remained visible on the screen throughout the exercise. Respondents were offered coffee and pastries after they completed the questionnaire.

Police candidates completing their 15-week Basic Patrol Officer Training Program at the *École nationale de police du Québec* (Quebec's police Academy; "the Academy")<sup>1</sup> were asked to participate. Because the website hosting both videos at the University was blocked by the Academy, it was not possible to show the videos on individual computer screens; volunteers were thus randomly summoned to a group viewing to watch one of the two videos. Each viewing included up to 18 respondents who watched the video projected on a large screen with stereo speakers, and completed the questionnaire afterward on individual computers. Participants were asked not to discuss the subject of the video; members of the research team were present to enforce this requirement. The research was presented as an extra-curricular voluntary activity; still, the vast majority of police candidates (202/216; 93.5 %) agreed to participate.

### Samples composition and data analysis

Before running the experiment, power analyses were conducted using G\*Power (Faul et al. 2007) to determine a sufficient sample size. A minimum of 100 participants per group was deemed sufficient to test the hypotheses.<sup>2</sup> Four groups were anticipated: 1) video A / university ( $n = 116$ ), 2) video B / university ( $n = 115$ ), 3) video A / academy ( $n = 100$ ) and 4) video B / academy ( $n = 102$ ). The current experiment was an attempt to test whether perceptions of a police intervention differed based on the angle of the camera used to film the footage. Differences in sample characteristics between respondents from the university and the academy were expected but irrelevant for this study; however, differences in sample characteristics within establishments would potentially bias—or worse, invalidate—the results. Random assignment was used to overcome any systematic differences between groups within establishments. Descriptive statistics and bivariate tests for all four configurations are presented in [Appendix A](#); there are no significant differences between groups 1 and 2 (the university groups) nor between groups 3 and 4 (the academy groups), which suggests that randomization successfully produced equivalent groups. Thus, any difference between groups within establishments can be confidently attributed to the camera angle.

Because most variables are categorical/ordinal, contingency tables are presented below, while Phi (for  $2 \times 2$  tables) and Cramer's V (for other tables) coefficients were used to measure the strength of association between variables. All statistical tests were conducted using SPSS 22.

---

<sup>1</sup> The education system is different in Quebec than in most jurisdictions: students pursue secondary education for 5 years, followed by CEGEP (Collège d'enseignement général et professionnel) for 2 or 3 years (depending on the program), followed by undergraduate studies. With very few exceptions, police candidates have a CEGEP degree before they begin their 15-week training at the academy.

<sup>2</sup> The camera perspective bias in videotaped confession is considered robust and quite large (Lassiter et al. 2002a). Knowing this, a priori two-tailed statistical power analyses setting a significance level of  $p < 0.05$ , a required power of 0.8 (Cohen 1988), and equal sample sizes for both groups suggested that 400 respondents was largely sufficient to detect even a medium effect—a total sample size of 128 participants was required to detect an effect size of  $d = 0.5$ .



## Results

### Appropriateness of intervention

Table 1 displays responses from three items related to the appropriateness of the intervention (Hypothesis 1). The last three columns present a measure of association (Cramer's V) for three comparisons. The first ("University vs academy") compares establishments—a significant relationship indicating that respondents from the university reported significantly different opinions than police candidates, regardless of camera angle. The second compares respondents from the university who saw the first version with those who saw the version filmed with a body-worn camera (video B). The third looks at the same comparison between police candidates only. A significant relationship in the last two columns indicates that respondents from one establishment who watched one version of the video reported statistically significant different opinions from respondents who watched the other version, suggesting the existence of a camera perspective bias.

While not one of the areas being explicitly investigated in this study, the results show that police candidates report opinions that are significantly different from undergraduate students. In general, police candidates tend to agree with the actions of the officer in the intervention presented, regardless of how the question is formulated and which version of the video they watched. For example, a large percentage of respondents from the University reported that the intervention was questionable or blameworthy (81.4 %) while police candidates were more mixed (57.9 vs 42.1 %). Differences were even more prominent for the other two items. Such large differences were not totally unexpected, as attitudes towards use of force among police officers are usually understood to reflect a mix of selection and socialization that leads officers to an increasing adherence to the so-called "police culture" (Belur 2009; Paoline and Terrill 2014; Phillips et al. 2010).

When comparisons were made between respondents from the university or from the academy only, there were no significant differences between video A (surveillance camera) and video B (body-worn camera). This suggests that the camera perspective does not influence the general assessment of appropriateness of the intervention.

### Potential consequences for officer

With regard to the second hypothesis, the analysis again shows a large gap between undergraduate students and police candidates, with police candidates showing significantly less support for potential negative consequences (formal reprimand and mandatory additional training on use of force) and more support for a positive consequence (promotion) regardless of which version they watched (Table 2).

The results for university respondents also suggest that there is no camera perspective bias as there was no statistically significant difference between responses to video A and video B. However, a significant camera perspective bias was found among respondents from the academy. They reported less agreement for the possibility that officers be promoted for their good work and less agreement with both negative consequences—a formal reprimand and additional training. As expected, the effect is small (Cramer's V values of about 0.2), but was nevertheless detectable with a relatively small sample size.

**Table 1** Appropriateness of the intervention

Camera	University			Police academy			University vs academy Cramer's V and significance	University: video A vs video B Cramer's V and significance	Academy: video A vs video B Cramer's V and significance
	Surveillance	Body-worn	Both	Surveillance	Body-worn	Both			
N	116	115	231	100	102	202			
The intervention was:									
Excellent	1.7 %	1.7 %	1.7 %	13.0 %	10.8 %	11.9 %	0.498**	0.141	
Satisfactory	15.5 %	18.3 %	16.9 %	49.0 %	43.1 %	46.0 %			
Questionable	47.4 %	43.5 %	45.5 %	34.0 %	45.1 %	39.6 %			
Blameworthy	35.3 %	36.5 %	35.9 %	4.0 %	1.0 %	1.0 %			
Strongly agree	17.2 %	18.3 %	17.7 %	61.0 %	56.9 %	58.9 %	0.513**	0.086	
Somewhat agree	41.4 %	35.7 %	38.5 %	34.0 %	38.2 %	36.1 %			
Somewhat disagree	21.6 %	31.3 %	26.4 %	5.0 %	3.9 %	4.5 %			
Strongly disagree	19.8 %	14.8 %	17.3 %	0.0 %	1.0 %	0.5 %			
The level of force used by the officer was appropriate									
Strongly agree	2.6 %	2.6 %	2.6 %	17.0 %	22.5 %	19.8 %	0.642**	0.105	
Somewhat agree	9.5 %	13.9 %	11.7 %	55.0 %	53.9 %	54.5 %	0.072		
Somewhat disagree	30.2 %	30.4 %	30.3 %	20.0 %	19.6 %	19.8 %			
Strongly disagree	57.8 %	53.0 %	55.4 %	8.0 %	3.9 %	5.9 %			

\*\* $p < 0.01$ ; \* $p < 0.05$ ; † $p < 0.10$

**Table 2** Potential consequences

	Camera	University			Police academy			University vs academy		University: video A vs video B		Academy: video A vs video B	
		Surveillance	Body-worn	Both	Surveillance	Body-worn	Both	Cramer's V and significance	Cramer's V and significance	Cramer's V and significance	Cramer's V and significance		
N		116	115	231	100	102	202						
Promotion	Strongly agree	0.9 %	0.9 %	0.9 %	2.0 %	0.0 %	1.0 %	0.359**	0.088	0.207*			
	Somewhat agree	6.0 %	3.5 %	4.8 %	20.0 %	10.8 %	15.3 %						
	Somewhat disagree	23.3 %	29.6 %	26.4 %	42.0 %	59.8 %	51.0 %						
	Strongly disagree	69.8 %	66.1 %	68.0 %	36.0 %	29.4 %	32.7 %						
Reprimand	Strongly agree	38.8 %	44.3 %	41.6 %	5.0 %	1.0 %	3.0 %	0.589**	0.116	0.176†			
	Somewhat agree	28.4 %	30.4 %	29.4 %	12.0 %	13.7 %	12.9 %						
	Somewhat disagree	21.6 %	20.0 %	20.8 %	46.0 %	35.3 %	40.6 %						
	Strongly disagree	11.2 %	5.2 %	8.2 %	37.0 %	50.0 %	43.6 %						
Additional training	Strongly agree	52.6 %	52.2 %	52.4 %	4.0 %	2.9 %	3.5 %	0.636**	0.004	0.219*			
	Somewhat agree	29.3 %	29.6 %	29.4 %	24.0 %	13.7 %	18.8 %						
	Somewhat disagree	11.2 %	11.3 %	11.3 %	51.0 %	43.1 %	47.0 %						
	Strongly disagree	6.9 %	7.0 %	6.9 %	21.0 %	40.2 %	30.7 %						

\*\**p* < 0.01; \**p* < 0.05; †*p* < 0.10

## Retention of details and distance perception

Because of the care taken to ensure equivalence between respondents in groups within institutions, the effect can be confidently attributed to the camera perspective. However, while it is clear that a camera perspective bias does exist among police candidates, it does not explain which perceptions are affected by the camera perspective change. Table 3 shows responses to two items intended to measure potential explanations (hypotheses 3 and 4: distance and attention to details — color of shirt). Responses to other items are not presented because almost all respondents successfully reported that the man was first sitting on a couch (90.0 % for undergraduate students and 93.6 % for police candidates) and attacked officers with a baseball bat (97.3 % for undergraduate students and 100 % for police candidates). The “fired too late” element is not reported in Table 3 because of its rare occurrence (three out of 433 respondents).

Again, we found significant differences between university respondents and respondents from the academy. A larger proportion of police candidates provided a correct answer to arguably the most difficult question on visual details in the video: the color of the suspect’s shirt. These results were expected because observation skills are important in police work and it is reasonable to think that these skills are either developed during the 3-year course of study in police technology—which the academy respondents had recently completed—or that candidates with poor observation skills do not make it through the academy. Also, consistent with results presented above, academy respondents were far more supportive of the intervention than were the undergraduates. The vast majority (84.2 %) of academy respondents believed that the officer was right to use his firearm in the situation presented in the video; in fact, most of the academy respondents (57.9 %) not only supported the use of a firearm in the situation but also reported that firing was timely. In sharp contrast, the majority of university respondents (65.8 %) reported that the officer should not have used his firearm during the intervention.

More relevant for the current study, no statistical difference was found between versions of the video, for either group, in terms of perception/retention of details. In other words, it seems that the camera perspective does not influence retention of details. In line with the findings presented above, however, there were significant differences in distance perception for police candidates only. Respondents from the academy who viewed the BWC perspective were significantly less likely to report that the officer should not have used his firearm in the intervention (10.8 vs 21.0 %) and considerably more likely to report that the officer fired too soon (32.4 vs 18.0 %), despite the fact that he fired at exactly the same distance in both versions of the video. This suggests that BWCs bias distance perception, or at least that viewers perceive objects and persons as being further from the officer wearing the camera than when shown the incident from another perspective.

## Discussion

As mentioned above, BWCs provide a video account of police interventions (which is often not otherwise available) from a perspective that is closer to what officers see during the action. Our results suggest the existence of a “body-worn camera perspective bias”: the controversial intervention was judged differently on specific items when it

was seen through a BWC as compared to a typical surveillance camera. The bias does not appear to be generalized, however; participants with little or no experience of police work or prior detailed knowledge of laws and procedures were not significantly affected by the camera perspective, while candidates who had almost finished their basic training program to become police officers were. In other words, the results suggest that the more one is trained to evaluate police interventions, the greater the effect of camera perspective. This result is explained in part by the fact that respondents from the academy who had seen the video filmed with a BWC were more likely to report that the officer fired too early, suggesting that distance perception is different through the lens of a bodycam. The hypothesis that differences in visual attention could explain the bias was not supported; the perception/retention of details was the same from one group to another, regardless of the version of the video viewed. An implication of these results is that people assigned to evaluate the appropriateness of an intervention (e.g., members of a committee monitoring police misconduct) might have biased perceptions if presented with video footage only from a BWC.

These results could indicate that members of the general public—such as university students—react more emotionally to images of controversial police interventions and thus are not sensitive to technical features of the footage such as the camera perspective. When viewers—such as trained police candidates—have the tools to analyze a situation, they might react more “coldly” to images of controversial interventions and consider various elements before providing their opinion. Indeed, many respondents from the university, regardless of the version they had seen, reported informally after completing the questionnaire that the subject should have been treated differently because he was suffering from mental health problems at the time of the intervention; respondents from the Academy instead discussed situational details such as distance, the presence of two other persons to protect in the room, and the lack of alternatives for the officer. In other words, respondents from the university analyzed the situation as a whole—and many found it aberrant that the police would intervene in the first place—while respondents from the academy acknowledged the situation and evaluated what the officer could have done in that situation—and evaluated the decision to shoot taking these options into account. Consistent with the idea of a perception-based bias (Lassiter et al. 2002b), the body-worn camera perspective bias affected only those who relied mainly on their perceptions—rather than their emotions—to provide an opinion.

The finding that a BWC distorts distance perception is not wholly surprising. Many body cameras are equipped with “fisheye” lenses that provide a wide-angle panoramic field of view of up to 170 degrees in all directions, which is considerably larger than what is provided by the average human eye, especially in terms of peripheral vision (Strasburger et al. 2011). This feature is marketed by suppliers as a way to “capture more of what you see” (Taser’s Axon 2) and “to record both the actions of the wearer and those in its field of view” (Viewu’s LE3).<sup>3</sup> However, it may be problematic when images are used as evidence to assess the appropriateness of an intervention, especially when force was used by an officer. First, fisheye lenses achieve their wide-angle view by creating a “hemispheric projection” of the environment that produces a convex non-rectilinear appearance that cannot be understood on ordinary geometric principles

<sup>3</sup> Some models offer night vision, which clearly provides a better image than what officers would see. However, this feature is not as common as wide-angle lenses.

**Table 3** Perception/retention of visual details and distance perception

	Camera	University			Police academy			University vs academy		University: video A vs video B		Academy: video A vs video B	
		Surveillance	Body-worm	Both	Surveillance	Body-worm	Both	Phi and significance	Phi and significance	Phi and significance	Phi and significance	Phi and significance	
<i>N</i>	116	115	231	100	102	202							
Color of the man's shirt	Correct answer	34.5%	43.5%	39.0%	59.0%	63.7%	61.4%	0.224**	0.092	0.049			
Distance perception	Fired timely	10.3%	8.7%	9.5%	59.0%	56.9%	57.9%	0.517**	0.028	0.022			
	Fired too early	27.6%	20.9%	24.2%	18.0%	32.4%	25.2%	0.012	0.078	0.165*			
	Should not have used firearm	62.1%	69.6%	65.8%	21.0%	10.8%	15.8%	0.504**	0.079	0.140*			

\*\**p* < 0.01; \**p* < 0.05

(Schwalbe et al. 2009; Steyn 1980). In other words, a lens of this kind creates enormous distortion, and the estimation of distance is consequently much more difficult (Kingslake 1989). Some recent models of BWCs are equipped with “regular” lenses that eliminate the fisheye distortion; the video that was shown to participants of the current study was filmed with the least distortive lens available, and yet police candidates still saw the assailant as further away in the BWC footage.

An additional concern is that footage from BWCs may complicate applying an objectively reasonable standard to judging use of force by officers, which is usually done by determining if a reasonable officer on the scene would have acted in the same way (Terrill 2009). By capturing anything that could have been visible to the officer—whether or not the officer was actually aware of it or considered it in the decision to use force—BWCs not only provide a strong incentive to analyze the situation with “the 20/20 vision of hindsight” that the U.S. Supreme Court prohibited 25 years ago (*Graham v. Connor*, 490 389 U.S. 1989), they do so by providing more information than was probably perceived by the officer. BWCs offer an unprecedented a posteriori access to police interventions, but guidelines on how they are to be used need to be created to help ensure that they are part of unbiased assessments that are fair to both subjects and officers.

### Limitations and research avenues

The experiment presented in this paper is a first step. It investigated the existence of a camera perspective bias only in the context of a controversial police intervention—a short, fast-paced intervention that culminated in the use of lethal force by the officer. The bias needs to be tested using videos that present a wider range of interventions: with or without the use of force, with less-lethal weapons (e.g., conducted-energy device, baton, pepper spray), with physical force only, and so on. If experience is seen as a continuum, it could also be argued that only mid-range participants were questioned. Respondents from the university may be better informed than the average “unexperienced” individual; respondents from the academy have greater knowledge of police practices and procedures than the average person but little practical experience compared to police officers. The generalizability of the camera perspective bias must be tested with other samples of respondents.

The main limitation of this experiment is similar to that in Lassiter and Irvine (1986) in that, while it provides evidence of a perspective bias, it cannot tell us which aspect of the camera perspective was biased. That is, did the BWC point of view lead participants to perceive the intervention as more dangerous than it actually was, or did the surveillance point of view lead them to perceive it as less dangerous? Whether either camera captured a truly objective point of view is unproven: a careful interpretation of the findings would be that BWCs produce images that may be interpreted differently than those taken from another, previously more common, point of view. Future research should compare the BWC point of view to other points of view (e.g., footage from a witness’s telephone), a written description of the intervention, an oral depiction, and so on.

Another limitation is that camera perspective bias is not well understood. Significant differences were found in distance perception—and respondents who perceived the assailant as further from the officer were more likely to report that the intervention was inappropriate. However, the attempt to measure visual attention provided mixed results:



there was no significant difference between points of view, and very high success rates were obtained on both perspectives. It is possible, given this experiment, that the visual attention hypothesis should be rejected. Relatedly, an alternative explanation for the camera perspective bias has not been investigated in the current study. Hennessy and Jakubowski (2007) suggest an interpretation that is in line with the idea of an actor–observer bias—the tendency to overemphasize dispositional/individual actions and underemphasize the situational causes of the actions of others. Respondents who viewed footage from the BWC may have put themselves in the place of the officer and asked what they would have done in the same situation; this possibility is even more likely with those in the police academy, who were expecting to start their career as police officers in a few months. It remains a possibility that the BWC footage viewed by trained respondents led to both a distance bias and an actor–observer bias.

**Acknowledgments** This work was supported by the Social Sciences and Humanities Research Council (Canada) under Grant 430-2014-0213. The authors would like to thank Maude Paquet, Chloé Leclerc, and Jean-François Vandry for their comments on a preliminary version, as well as Joan McGilvray for her careful copyediting.

## Appendix A

**Table 4** Descriptive statistics

	University			Police academy			
	Camera	Surveillance	Body-worn	Both	Surveillance	Body-worn	Both
<i>N</i>		116	115	231	100	102	202
Gender (% female)		55.2 %	59.1 %	57.1 %	19.0 %	18.6 %	18.8 %
Age	15–24	64.7 %	60.9 %	62.8 %	76.0 %	69.6 %	72.8 %
	25–34	24.1 %	29.6 %	26.8 %	23.0 %	26.5 %	24.8 %
	35–44	8.6 %	6.1 %	7.4 %	1.0 %	2.9 %	2.0 %
	45–54	1.7 %	3.5 %	2.6 %	0.0 %	1.0 %	0.5 %
	55 +	0.9 %	0.0 %	0.4 %	0.0 %	0.0 %	0.0 %
Relative/close friend is police officer		26.7 %	22.6 %	24.7 %	39.0 %	43.1 %	41.1 %
Highest diploma: university		–	–	–	15.0 %	19.6 %	17.3 %

## References

- Ariel, B., Farrar, W. A., & Sutherland, A. (2015). The effect of police body-worn cameras on use of force and citizens' complaints against the police: a randomized controlled trial. *Journal of Quantitative Criminology*, 31(3), 509–535.
- Ariel, B., Sutherland, A., Henstock, D., Young, J., Drover, P., Sykes, J., Megicks, S., & Henderson, R. (2016). Report: increases in police use of force in the presence of body-worn cameras are driven by officer

- discretion: a protocol-based subgroup analysis of ten randomized experiments. *Journal of Experimental Criminology*. doi:10.1007/s11292-016-9261-3.
- Belur, J. (2009). Police use of deadly force police perceptions of a culture of approval. *Journal of Contemporary Criminal Justice*, 25(2), 237–252.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale: L. Erlbaum Associates.
- Elek, J. K., Ware, L. J., & Ratcliff, J. J. (2012). Knowing when the camera lies: judicial instructions mitigate the camera perspective bias. *Legal and Criminological Psychology*, 17, 123–135.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G\*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175–191.
- Graham v. Connor, 490 389 (U.S. 1989).
- Grossmith, L., Owens, C., Finn, W., Mann, D., Davies, T., & Baika, L. (2015). *Police, camera, evidence: London's cluster randomized controlled trial of Body Worn Video*. London: College of Policing, Mayor of London, Metropolitan Police.
- Hennessy, D. A., & Jakubowski, R. (2007). The impact of visual perspective and anger on the actor-observer bias among automobile drivers. *Traffic Injury Prevention*, 8, 115–122.
- IACP. (2005). *The impact of video evidence on modern policing*. Washington D.C.: U.S. Department of Justice—Office of Community Oriented Policing Services.
- Jennings, W. G., Fridell, L. A., & Lynch, M. D. (2014). Cops and cameras: officer perceptions of the use of body-worn cameras in law enforcement. *Journal of Criminal Justice*, 42, 549–556.
- Jennings, W. G., Lynch, M. D., & Fridell, L. A. (2015). 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. *Journal of Criminal Justice*, 43, 480–486.
- Kahan, D. M., Hoffman, D. A., & Braman, D. (2009). Whose eyes are you going to believe? Scott V. Harris and the perils of cognitive illiberalism. *Harvard Law Review*, 122(1), 1–67.
- Kassin, S. M., Drizin, S. A., Grisso, T., Gudjonsson, G. H., Leo, R. A., & Redlich, A. D. (2010). Police-induced confessions: risk factors and recommendations. *Law and Human Behavior*, 34, 3–38.
- Katz, C. M., Kurtenbach, M., Choate, D. E., & White, M. D. (2015). *Phoenix, Arizona, smart policing initiative: evaluating the impact of police officer body-worn cameras*. Phoenix: Smart Policing Initiative Spotlight Report.
- Kingslake, R. (1989). *A history of the photographic lens*. Chicago: Elsevier.
- Kraft, R. N. (1987). The influence of camera angle on comprehension and retention of pictorial events. *Memory & Cognition*, 15(4), 291–307.
- Landstrom, S., & Granhag, P. A. (2008). Children's truthful and deceptive testimonies: how camera perspective affects adult observers' perception and assessment. *Psychology, Crime & Law*, 14(5), 381–396.
- Landstrom, S., Af Hjelmsater, E. R., & Granhag, P. A. (2007). The camera perspective bias: a case study. *Journal of Investigative Psychology and Offender Profiling*, 4, 199–208.
- Lassiter, G. D., & Irvine, A. A. (1986). Videotaped confessions: the impact of camera point of view on judgments of coercion. *Journal of Applied Social Psychology*, 16(3), 268–276.
- Lassiter, G. D., Slaw, R. D., Briggs, M. A., & Scanlan, C. R. (1992). The potential for bias in videotaped confessions. *Journal of Applied Social Psychology*, 22(23), 1838–1851.
- Lassiter, G. D., Geers, A. L., Munhall, P. J., Handley, I. M., & Beers, M. J. (2001). Videotaped confessions: is guilt in the eye of the camera? *Advances in Experimental Social Psychology*, 33, 189–254.
- Lassiter, G. D., Beers, M. J., Geers, A. L., Handley, I. M., Munhall, P. J., & Weiland, P. E. (2002a). Further evidence of a robust point-of-view bias in videotaped confessions. *Current Psychology*, 21(3), 265–288.
- Lassiter, G. D., Geers, A. L., Mandell, L. M., Ploutz-Snyder, R. J., & Breitenbecher, D. L. (2002b). Illusory causation: why it occurs. *Psychological Science*, 13(4), 299–305.
- Lassiter, G. D., Seidman Diamond, S., Schmidt, H. C., & Elek, J. K. (2007). Evaluating videotaped confessions: expertise provides no defense against the camera-perspective effect. *Psychological Science*, 18(3), 224–226.
- Lassiter, G. D., Ware, L. J., Ratcliff, J. J., & Irvin, C. R. (2009). Evidence of the camera perspective bias in authentic videotaped interrogations: implications for emerging reform in the criminal justice system. *Legal and Criminological Psychology*, 14, 157–170.
- Lum, C., Koper, C., Merola, L., Scherer, A., & Reieux, A. (2015). *Existing and ongoing body worn camera research: knowledge gaps and opportunities*. Fairfax: Center for Evidence-Based Crime Policy, George Mason University.
- Mandell, L. M., & Shaw, D. L. (1973). Judging people in the news — unconsciously: effect of camera angle and bodily activity. *Journal of Broadcasting*, 17(3), 353–362.

- McArthur, L. Z. (1980). Illusory causation and illusory correlation: two epistemological accounts. *Personality and Social Psychology Bulletin*, 6(4), 507–519.
- Paoline, E. A., & Terrill, W. (2014). *Police culture: Adapting to the strains of the job*. Durham: Carolina Academic Press.
- Park, K., & Pyo, J. (2012). An explanation for camera perspective bias in voluntariness judgment for video-recorded confession: suggestion of cognitive frame. *Law and Human Behavior*, 36(3), 184–194.
- Phillips, S. W., Sobol, J. J., & Varano, S. P. (2010). Work attitudes of police recruits: is there a family connection? *International Journal of Police Science & Management*, 12(3), 460–479.
- Ratcliff, J. J., Lassiter, G. D., Schmidt, H. C., & Snyder, C. J. (2006). Camera perspective bias in videotaped confessions: experimental evidence of its perceptual basis. *Journal of Experimental Psychology*, 12(4), 197–206.
- Ready, J. T., & Young, J. T. N. (2015). The impact of on-officer video cameras on police-citizen contacts: findings from a controlled experiment in Mesa, AZ. *Journal of Experimental Criminology*, 11, 445–458.
- Reaves, B. A. (2015). *Local police departments, 2013: Equipment and technology*. Washington, D.C.: Bureau of Justice Statistics.
- Schwalbe, E., Maas, H. G., Kenter, M., & Wagner, S. (2009). Hemispheric image modeling and analysis techniques for solar radiation determination in forest ecosystems. *Photogrammetric Engineering & Remote Sensing*, 75(4), 375–384.
- Scott vs. Harris, 550 372 (U.S. 2007).
- Steyn, D. G. (1980). The calculation of view factors from fisheye-lens photographs: Research note. *Atmosphere–Ocean*, 18(3), 254–258.
- Strasburger, H., Rentschler, I., & Juttner, M. (2011). Peripheral vision and pattern recognition: a review. *Journal of Vision*, 11(5), 1–82.
- Terrill, W. (2009). The elusive nature of reasonableness. *Criminology & Public Policy*, 8(1), 163–172.
- Tueller, D. [2004 (1983)]. How close is too close? Retrieved February 4, 2016, from [http://www.theppsc.org/Staff\\_Views/Tueller/How.Close.htm](http://www.theppsc.org/Staff_Views/Tueller/How.Close.htm).
- Ware, L. J., Lassiter, G. D., Patterson, S. M., & Ransom, M. R. (2008). Camera perspective bias in videotaped confessions: evidence that visual attention is a mediator. *Journal of Experimental Psychology*, 14(2), 192–200.

**Rémi Boivin** has a PhD in criminology and is Assistant Professor at the School of Criminology, Université de Montréal. He is also deputy director of the International Centre for Comparative Criminology. His research interests include decision-making, police use of force and crime analysis. His recent work has appeared in the Canadian Journal of Criminology and Criminal Justice, Global Crime, Police Quarterly, Security Journal, Social Indicators Research and Violence & Victims.

**Annie Gendron** has a PhD in psychology and is researcher at the Strategic Research and Development Center, École nationale de police du Québec (Police Academy). She is a regular researcher at the International Centre for Comparative Criminology.

**Camille Faubert** is a doctoral student in criminology at the School of Criminology, Université de Montréal, and a research assistant at the International Centre for Comparative Criminology. Her doctoral dissertation will be on attitudes towards police use of force.

**Bruno Poulin** has a M.Sc. in Human Kinetics and is use of force expert at the Knowledge and Expertise Centre, École nationale de police du Québec.