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Police Body-Worn Cameras: Development of the Perceived Intensity of Monitoring Scale

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Abstract

Body-worn cameras (BWCs) are the latest and perhaps most tangible answer to complex social questions regarding the use of force, state legitimacy, and the proper role of police in a liberal democracy. How do officers experience heightened monitoring? This article pursues two objectives via two studies. In the first study, we establish a valid and reliable scale to measure police officer perceptions of the risks posed to them by the recording and distribution of BWC footage, conceptualized as Perceived Intensity of Monitoring (PIM). Based on a survey of 617 police officers, we evaluate an 11-item questionnaire and assess internal consistency and construct validity, perform exploratory factor analysis, and derive a PIM Scale composed of three factors measuring officer perceptions of discretion, disapproval, and distribution effects. In the second study, we evaluate the PIM Scale's ability to predict officer emotional exhaustion, discriminating between BWC and non-BWC equipped officers. This study contributes to evolving work in BWC research by developing a useful measure for police administrators and practitioners charged with making decisions related to BWC implementation and policy. Further, the PIM Scale is applicable across professions other than policing, as surveillant workplace monitoring and technologies of accountability continue to expand to other contexts.

Keywords

body-worn cameras, PIM scale, electronic performance monitoring, burnout, police, scale development

Perhaps the most visible technological answer to contemporary questions surrounding police use of force and public oversight is the body-worn camera (BWC). Like most police reforms, rapid introduction of BWCs into American policing has occurred without much input from rank-and-file officers (Bayley, 2008). Limited scholarship on officer attitudes toward BWCs exists, and this area remains one in which scholars continue to call for more research (Kyle & White, 2017). The Presidential Task Force on 21st Century Policing, created in response to protests in Ferguson, MO,

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that spread throughout the country, provided $75 million in federal grants for police departments to purchase BWCs in 2015 (Edwards, 2015). Police BWCs are intended to increase transparency in policing, decrease police use of force, and decrease the number of citizen complaints filed against police.

While there are still no uniform national standards, BWC rollout in the United States has grown from a few testing units in 2014 to a multibillion dollar industry. *Governing* magazine estimates that fully 95% of large U.S. police departments have had, or are planning, full BWC implementation (Maciag, 2016). Adoption has far outpaced analysis as researchers have only recently begun to explore the intentional and unintentional effects of this new technology (Lum, Koper, Merola, Scherer, & Reioux, 2015; Lum, Stoltz, Koper, & Scherer, 2019). Overall, results from published research on BWC outcomes are mixed, and none have examined officer perceptions of heightened monitoring.

The paper proceeds in five sections. The first section provides a background on BWC policy, leading to contemporary academic and practitioner disagreements regarding the symbolic, behavioral, and informational consequences (Stoughton, 2017) of evolving BWC policy and use. The second section situates BWCs in the broader literature on electronic performance monitoring. The third section describes Study 1, in which the construction of the Perceived Intensity of Monitoring (PIM) Scale is described. The fourth section describes Study 2, in which we investigate the relationship between PIM and burnout using structural equation modeling. The fifth and final section assesses the implications of our findings for BWC research specifically, and criminal justice more broadly, and identifies avenues for future research.

Study Motivation

To date, the research foci of the BWC literature have been on questions of police legitimacy, through the frame of police use of force and external complaints (Lum, Koper, Merola, Scherer, & Reioux, 2015; Lum, Stoltz, Koper, & Scherer, 2019; White, Gaub, & Todak, 2017). While it is fair to characterize the modest body of literature as having established promising results for the ability of BWCs to deliver on reduced use of force and complaints, the evidence remains equivocal. The present study follows previous work that situated the effects of wearing BWCs on officers themselves (Adams & Mastracci, 2018) as an important current in the stream of BWC research.

Police officers equipped with BWCs are not only surveilled by their employer. Given the chance that BWC footage may be distributed across public channels, officers are also monitored by their departments, the judicial system, and the public at large. To date, the literature is largely silent on the individual-level consequences for officers whose actions are broadcast across television and social media. Transparency may benefit the public but it carries potential consequences of exposure, not just for officers, but also for those with whom they interact (Adams & Mastracci, 2017). An exemplar of this perception is found in one veteran Chicago officer who reveals that he does not fear injury or death on the job, but rather the threat of being portrayed as an "evil person" in media coverage (Martinez, 2018), and his "family and friends have to deal with me being put on the news" (p. 4). A close reading of this officer's statement reveals concerns about the intensity of BWCs are along two separate yet related dimensions. First, others' judgments of his discretionary, split-second decision-making; and second, ongoing public reaction after distribution of the resulting footage (Martinez, 2018, p. 5):

> We are all camera'd up. We are all mic'd up. We have cameras in the car, on our person. I mean how much more, how much more do you want to put on top of us having to make that split-second decision? I mean it weighs. It weighs heavy.

We investigate officer perceptions of the intensity of BWC surveillance; perceptions of those equipped with BWCs as well as those without. From ongoing and prior research (Adams & Mastracci, 2018), a multifaceted concern over the effects of BWCs has emerged: Concerns about others' judgments of their exercise of discretion, concerns about public disapproval, and the extent to which footage is distributed over time and space.

BWCs as Electronic Employee Monitoring

BWCs are best understood as both a technological solution to enduring debates surrounding police use of force and the latest iteration of employee monitoring in public organizations (Fusi & Feeney, 2018). Electronic performance monitoring has both direct and indirect effects on workers (Carayon, 1993), and empirical evidence shows that workplace surveillance increases job stress and contributes to poorer health of workers (Aiello & Shao, 1993; Smith, Carayon, Sanders, Lim, & LeGrande, 1992). A recent line of research has examined BWCs as a form of electronic monitoring associated with increases in officer emotional exhaustion (Adams & Mastracci, 2018), which itself is associated with poorer health outcomes (Kop, Euwema, & Schaufeli, 1999; Maslach, 2005; Schaible & Six, 2016). The effects of electronic performance monitoring on productivity and the subjective experiences of employees are moderated by the social context of the workplace (Aiello & Kolb, 1995). Policing has long been recognized as constituting a distinct, even unique, social context (Bittner, 1973; Niederhoffer, 1967; Walker & Katz, 2012). Little is known, however, about how that social context affects how police officers themselves react to the increased internal administrative surveillance, or the external societal surveillance, represented by BWCs.

Our conceptual framework of BWCs as electronic performance monitoring follows work by Alder (2001) which attributes employees' reactions to monitoring as a consequence of organizational culture. Alder finds electronic monitoring is perceived as fairer when there is substantial employee input into designing the monitoring system and when the monitoring is restricted to actual job performance. To the first point, adoption of BWCs has been rapid and robust, and entirely imposed from above, and in some cases mandated through a court order. Frontline officers have had little to no input on the decision to adopt BWCs (Bayley, 2008) and when police labor organizations have attempted to oppose BWC implementation, those attempts have been largely defeated (McGinnes, 2016; New York Civil Liberties Union, 2013).

The second theme of fairness identified by Alder (2001), that monitoring is carefully restricted to job performance, is an open question in the BWC context. At present, most BWCs are activated manually by officers, and decisions to activate or not are guided by departmental policy. Best-practice guidance for activation (Stanley, 2015) balances the goals of transparency and accountability with the privacy of victims and witnesses who may be harmed by recording (Adams & Mastracci, 2017). Research demonstrates that an employee's ability to control the onset of performance monitoring improves performance while maintaining feelings of personal control (Stanton & Barnes-Farrell, 1996).

The literature on police discretion is broad and deep, and scholars have long grappled with the tension between discretion and accountability, particularly in the law enforcement context (Epp, Maynard-Moody, & Haider-Markel, 2014; Lipsky, 2010). Perceived intensity of workplace surveillance (Holman, Chissick, & Totterdell, 2002) represents a critical factor influencing the emotional labor of employees and is itself a source of increased workplace stress. For the purposes of this study, two critical factors affecting how employees perceive electronic performance monitoring are their sense of fairness in the use of workplace surveillance and measures of organizational trust (Carayon, 1993; Westin, 1992).

Both fairness and organizational trust are related to broader conceptions of organizational justice, and previous scholars have established organizational justice as a broad theoretical framework for

understanding police perceptions of BWCs (Kyle & White, 2017). Employees respond to the surveillant practices of management with their own resistance through "invisibility practices" which in turn drive higher demand for more surveillance by management (Anteby & Chan, 2018).

Police Perception of BWCs and Discretion

One abiding interest of BWC research is the perception of the technology by the officers charged with their use (Gaub, Choate, Todak, Katz, & White, 2016; Goetschel & Peha, 2017; Jennings, Lynch, & Fridell, 2015), and whether or not police officers and administrators (Smykla, Crow, Crichlow, & Snyder, 2016) support the use of BWCs has been the focus of limited inquiry. Officer attitudes toward BWCs, however, "have received the least attention" in the literature (Kyle & White, 2017, p. 70). Early scholars found a distinct streak of pessimism toward the technology among law enforcement personnel but that effect tended to reverse with more exposure and use (Gaub et al., 2016) as officers began to embrace the potential for BWCs to provide evidence against criminal suspects and exonerate officers from allegations of impropriety and policy violations.

Discretion and its appropriate use lie at the heart of public service generally (Maynard-Moody & Musheno, 2000; Rohr, 2017) and policing specifically (Epp et al., 2014). The scope of a police officer's duties is too broad to govern by policy alone and the endowed powers an officer may elect to use under the color of law range from no action to lethal force. Given those decisions are being made by a public servant who is insulated from electoral checks and political pressure, questions of discretion have long been recognized as necessary, as the power of discretion "is hard to square with traditional democratic theory" (Rohr, 2017, p. 3). The autonomy granted by discretion is of critical importance to the manner in which many public servants view their professional role, and as noted by Bayley (2011) in his comparison between academia and policing, "the discretion given professors is very great, and like police officers, they bitterly resent any attempt to supervise them" (p. 314).

Theories of deterrence have been used to explain results found in a number of BWC studies (Ariel et al., 2016b; Ariel, Sutherland, Henstock, Young, & Sosinski, 2017; Henstock & Ariel, 2017) and are the most accepted explanation for why researchers expect BWCs to result in both less police use of force and public complaints about police behavior. In this frame, BWCs are seen as a "technology of accountability" (Newell & Greidanus, 2017) because officers are expected to misbehave less as the risk of that behavior being discovered, administratively or by the public, increases. However, in studies where results are not consistent with theoretical expectations, two primary confounding effects have been identified. First, officers may become overdeterred and as a result fail to take police action soon enough. Second, officers may attempt a level of politeness not appropriate for the situation, leading to an increase in assaults against officers (Ariel et al., 2016b).

Three important BWC studies establish the importance of studying discretion in the BWC context. While there is little research guidance on how policy experimentation in this area has evolved, Ariel et al. (2016a) find varied effects of BWCs on police use of force and "it is precisely the issue of discretion where we believe that the effect of BWCs can vary" (p. 456). First, the counterintuitive findings that increase in the use of force by police wearing BWCs (Ariel et al., 2016a) were theorized to be driven by varying levels of discretion between study sites. Second, the same authors find that in addition to increases in the use of force, BWCs appeared to be related to increases in assaults on officers, suggesting that perhaps officers felt "over deterred" by the cameras (Ariel et al., 2016b). Finally, in a six-wave study of officer perceptions, White, Todak, and Gaub (2018) found that concerns about the effects of BWCs on professional discretion were high before BWC implementation and remained relatively high even after implementation.

How do police officers themselves perceive the impact of BWCs on their discretionary decision-making? This question is addressed in the current study. We follow previous work (Gaub et al., 2016; Kyle & White, 2017; White, Todak, & Gaub, 2018) and investigate how police officers

perceive the impact of BWCs on discretion. We describe our exploratory and piloting process below, but in sum, our initial questions about discretion and BWCs developed into a multifaceted set of measures to capture officer perceptions of BWC effects on discretion, public disapproval, and concerns over of public reprisals and the distribution of video footage. Together, this scale, conceived of as a PIM Scale, captures officer perceptions of monitoring intensity that have not been examined previously.

Officer Perceptions of Disapproval and Distribution Risk

While we conceptualize the discretion effect as occurring at the time the BWC is activated, contemporaneous accounts of police officers such as that reported in the introduction suggest interrelated second and third interthemes of perception related to BWCs. Per Martinez (2018), officers are concerned about being portrayed as "evil" in the media and the effects of widespread distribution of BWC footage on family and friends. This is by no means a rare concern in policing, and measuring the perception of distribution risk is a prime concern for this study. BWC footage is not merely recorded and then forgotten. In the United States, BWC footage is routinely cited in both local and national news sources, most often (but not always) in news stories reporting on police use of force.

Officers who worry about the harmful personal impacts that media coverage can have on their own lives are not misperceiving a threat. Darren Wilson, the police officer in Ferguson, MO, who shot and killed Michael Brown in 2014, is reported to have had to move his family, and keep his name off the deed to their new home, to protect himself and his family from repeated death threats, despite being cleared twice of any criminal wrongdoing (Halpern, 2015). While not necessarily representative of the common experience of police officers, Wilson's case is diagnostic, at least within policing. Wilson's case did not involve BWCs, though it precipitated rapid U.S. adoption of the cameras, as President Obama's Task Force on 21st Century Policing (President's Task Force, 2015) was empaneled shortly after, and a key recommendation of the task force was the adoption of BWCs across U.S. police agencies.

Kyle and White (2017) reveal that officers' broad conceptions of organizational justice influence their attitudes toward BWCs, but note that they "suspect that officer attitudes regarding BWCs may in fact be a multi-dimensional concept," and specifically call for further research to establish the indicators to "gauge whether officers believe [BWCs] would alter how they perform their duties" (p. 79). We answer that call with a construct we conceptualize as the discretion aspect of the PIM Scale. Kyle and White (p. 73) further predict, though do not measure, that the high visibility of BWC footage in the media "may produce . . . global fears over how BWC video of particular incidents may be used against the officer." We concur and aim to measure those hypothesized global fears with a construct we conceptualize as the distribution element of the PIM scale.

Study 1: Developing the PIM Scale

Method

Development of a PIM Scale contributes to the broad BWC research field, allowing researchers to test a theoretical construct across a wide range of policing contexts. With over 18,000 police departments in the United States alone, locating consistent effects is a central challenge in police research, and the establishment of uniform, replicable measures grants legibility not otherwise available in disparate contexts. To that end, we conduct surveys at two police departments using the same survey instrument ($n = 617$)[1].

Procedure

Two separate surveys at two police agencies were conducted for this study and their descriptive statistics are reported in Table 1. For scale development, two samples were constructed in two separate law enforcement agencies, both of which operate within the same county (population 1.107 million), have similar numbers of full-time law enforcement officers (approximately 400 each), and work along contiguous jurisdictional borders serving approximately the same number of residents. Other than forms of chief executive (one is headed by an appointed police chief and the other an elected sheriff), a critical difference between the agencies is that while Agency 1 has had full BWC implementation for approximately 3 years, Agency 2 currently has BWCs in only a minimal testing capacity. The sample constructions allow us to test for scalar invariance across differential geographic and BWC utilization.

We derive a total of 11 items from the survey which ask the respondents questions regarding their perceptions of specific BWC-related impacts. We analyze the items using principal axis factoring (PAF) and derive a three-factor scalar measure of officer perception of the discretion impacts of BWCs and the risks posed to them by public distribution of BWC footage. Finally, we test the validity of the structures with confirmatory factor analysis (CFA).

Respondents

Both Studies 1 and 2 evaluate responses drawn from a more extensive survey project, which includes more agencies and more total respondents. For the purposes of the studies reported here, however, research interest is restricted to police officers ($n = 617$) in two comparable policing agencies. The response rate for Agency 1 was 49.01% and for Agency 2 was 43.44%, suggesting we can forgo elaborate checks for nonresponse bias.

On average, respondents have over 14 years of law enforcement experience ($n = 613$; $m = 14.26$, $SD = 8.79$) and are primarily male ($n = 495$; 86.87%). On average the respondents are 41 years old ($n = 489$; $m = 41.71$, $SD = 9.47$) and range between 22 and 71 years old. The racial composition of the sample ($n = 511$) was predominantly Caucasian (82.58%), with small numbers of Hispanic/Latino (2.54%), Native Hawaiian or Pacific Islander (2.35%), Asian (1.76%), and Black (0.78%) officers; nearly 10% of the sample reported their racial group as "other." The education levels of respondents ($n = 497$) were reported as high school diploma (8.25%), some college (39.84%), 2-year college degree (14.29%), 4-year college degree (30.38%), and master's degree (6.84%). Two of the respondents (0.40%) reported having a professional-level degree.

Additional demographic data were collected, including rank, position, military service, sexual orientation, marital status, and political ideology. A full descriptive report of sample demographics can be found in Table 1. In order to test for agency-level differences in the sample, a series of *t* tests were administered across the demographic variables for officers. Except for educational attainment, which was slightly higher in Agency 1 than Agency 2, no significant differences for demographic measures were found across agencies. A check of correlation between education and general support for agency-wide use of BWCs indicates a low correlation of .093. In Study 2, where we test a structural model using the PIM Scale for effect on emotional exhaustion, we test for the effect of education level and find none.

Note that while the sample consists of 617 respondents, both Studies 1 and 2 employ asymptotic distribution free (ADF) modeling for estimating both the CFA and structural equation model (SEM). ADF is a more conservative choice of estimation method given the ordinal outcome measures employed (Kline, 2015; Newsom, 2015; Suhr, 2006). Both studies start with a sample pool of the 201 respondents who are equipped with BWCs; however, ADF estimating handles any missing response in a model variable by dropping the entire observation. Dropping observations results in

Table 1. Descriptive Statistics: Officer Demographics.

Continuous Variables (only for Age and Years of Experience)	*n*	*M*	*SD*	Min	Max
Age	489	41.71	9.47	22	71
Years of experience	613	14.26	8.79	0	42
Categorical variables	***n***	**%**			
Sex	495				
Male	430	86.87			
Female	65	13.13			
Race	511				
White	422	82.58			
Black	4	0.78			
Asian	9	1.76			
Hispanic/Latino	13	2.54			
Native Hawaiian or Pacific Islander	12	2.35			
Other	51	9.98			
Education	497				
High school	41	8.25			
Some college	198	39.84			
Assoc. degree	71	14.29			
Bachelor's degree	151	30.38			
Master's degree	34	6.84			
JD, MD, PhD	2	0.40			
Officer rank	614				
Officer	465	75.73			
Sergeant	101	16.45			
Lieutenant	34	5.54			
Above lieutenant	14	2.28			
Officer capacity	617				
Patrol	159	25.77			
Investigator	107	17.34			
Administration	49	7.94			
Corrections	157	25.45			
Specialty	107	17.34			
Other	38	6.16			
Wear BWC	617				
Yes	201	32.58			
No	416	67.42			
Worn BWC time	201				
Less than 6 months	14	6.97			
6 months to 1 year	20	9.95			
1 to 2 years	46	22.89			
2 to 3 years	33	16.42			
More than 3 years	88	43.78			
Military service now	491				
Yes	20	4.07			
No	471	95.93			
Military service ever	495				
Yes	108	21.82			
No	387	78.18			
Marital status	494				
Married	378	76.52			
Divorced	52	10.53			
Never married	43	8.70			
Separated	3	0.61			
Widowed	2	0.40			
Prefer not to say	16	3.24			

Note. $n = 617$. BWC = Body-worn camera.

Table 2. Individual Rotated Loadings on Two-Factor Perceived Intensity of Monitoring Scale.

	Discretion	Disapproval	Distribution
Factor 1: Eigenvalue = 4.360			
Item 1—Freedom	.4787	.0042	.0146
Item 2—Decision-making	.4341	−.0004	−.018
Item 3—Manipulate	.4829	−.0312	−.0182
Item 4—Modify	.4280	.0186	.0515
Factor 2: Eigenvalue = 2.114			
Item 5—Personal	−.0108	.665	.0251
Item 6—Embarrassing	−.0214	.6528	.0117
Item 7—Hatred	.1294	.3531	−.1243
Item 8—Assault	.3845	−.0462	−.004
Factor 3: Eigenvalue = 1.599			
Item 5—Fair	.0264	−.0331	.5672
Item 6—Protect	−.0105	.044	.5669
Item 7—Well-being	−.0057	.0199	.5806

slight variation in the number of respondents reported in the final estimation, with the CFA (n = 191) losing 10 observations and the SEM (n = 179) losing 22 observations. The SEM reported in Study 2 loses more observations because it is a more complex model with an additional latent outcome, which increases the number of variables at risk of missingness. Importantly, samples at this size are ideal for SEM methods and the loss of the observations through missingness is within the expected range for the methods employed (Kline, 2015; Newsom, 2015). Alternatively, in place of ADF estimation, we could select full information maximum likelihood (FIML), which has the advantage of retaining observations at the cost of slightly inflated standard errors, as it imputes stochastically generated values for missing data. However, we opt for the more conservative procedure in ADF, as robustness checks of both procedures generated similar path estimations and ADF grants higher reliance for the *SD*s reported, while also being the correct estimation method when estimating ordinal outcomes.

Measures

Our three dimensions of perceived intensity of electronic monitoring—use of discretion, public disapproval, and distribution of video footage—do not have existing measures in the literature, an absence that provoked our original interest in this study. Initial feedback from officers in previous work indicated that they were concerned with how BWCs impact their ability to do their jobs as well as impacts on their families and personal lives should BWC footage become public. Following consultation with police officers and our review of existing literature on perceptions of surveillance intensity in the workplace, we generate 11 survey items that both capture the intent while avoiding conceptual overlap between items. Those items were piloted to a small number of police officers who provided critical feedback and allowed us to construct the final items for inclusion within the final survey. Detailed question wording and evaluation are reported below in our discussion of factor analysis.

Results: Factor Analysis and Measurement Invariance

We analyze the individual items of the proposed scale and report the factor loadings in Table 2. We use PAF analysis, consistent with widely accepted best practices (Costello & Osborne, 2005). We approach the question of surveillant intensity among police with a priori conceptions of how the

variables are related (Floyd & Widaman, 1995) based on our training, research history, and professional experiences. When assumptions of normality can be assumed, maximum likelihood estimation tends to be the appropriate choice in factor analysis (Fabrigar, Wegener, MacCallum, & Strahan, 1999). However, the preliminary and exploratory nature of our inquiry demands a more conservative approach that does not assume normality, and in such cases, PAF is the preferred method (Fabrigar et al., 1999; Floyd & Widaman, 1995). The Kaiser–Meyer–Olkin measure verified the sample adequacy of the analysis (KMO = 0.7948), and all KMO values for individual items were above the acceptable limit of 0.5 (Field, 2013). Three factors return eigenvalues that meet the Kaiser criterion of 1 and together explain 73.40% of the variance. A scree plot of the eigenvalues (not shown) confirms that the remaining items for each factor are nonexplanatory. The loadings are rotated (direct oblimin) to maximize the item loadings on the two extracted factors and minimize loadings on the unretained components. As the factors are theoretically correlated, we select direct oblimin rotation and examine those loadings with measures over the communality cutoff of 0.40, a level generally endorsed when sample size is adequate to retain a ratio of approximately 10:1 (Floyd & Widaman, 1995; Tabachnick & Fidell, 2001); that is, 10 observations to one factor, which our data obtain.

The 11 items cluster together on three themes—use of discretion, public disapproval, and distribution of footage—as reported in Table 2, and we examine the 11 items to find similar themes. Four items clustering on the first factor all ask respondents to react to how BWCs affect the use of discretion on the job. The loadings for all 4 items are satisfactory and together explain 39.64% of the variance within all measures, so we retain all 4 items in **Discretion**:

Item 1 discretion wording: Wearing a body camera limits my freedom to perform my job as I see fit.
Item 2 discretion wording: Wearing a body camera diminishes my ability to make the right decisions in some situations.
Item 3 discretion wording: Wearing a body camera manipulates the way I perform my job.
Item 4 discretion wording: Wearing a body camera pressures me to modify certain practices I have had in the past.

In contrast, the 4 items clustering on the second construct elicit respondents' perceptions of threats resulting from BWC video recording. These threats might be physical assault, becoming an object of public disapproval, or as often reported to us in discussions with officers, the risk of being captured in embarrassing situations. Table 2 shows that items measuring officer perceptions of increased physical assault (Ariel et al., 2016b) or of becoming the object of public outrage do not covary with fears of being captured in embarrassing situations. As such, we retain the latter two items, which are thematically related to the construct of public **Disapproval**. Analyzed separately, this factor explains 19.23% of the variance among all items:

Item 1 disapproval wording: I worry that a BWC will capture personal details of my life.
Item 2 disapproval wording: BWCs capture personal information that could be embarrassing to me if released to the public.

The final 3 items query respondents regarding their perceptions on how BWC footage is distributed within their agency. This factor was unexpected but makes sense theoretically. An officer concerned about BWCs capturing embarrassing footage is not merely worried about the recording, but rather, public reaction to it. The 3 items are thematically related to the concept of how BWC footage is distributed to the public and how the department protects officer privacy and well-being. All three items have satisfactory loadings and we retain all three in a third factor thematically related to **Distribution**, which explains 14.54% of the variance among all items:

Item 1 distribution wording: I trust my department to fairly distribute BWC footage to the public.

Item 2 distribution wording: My department does a good job protecting my privacy when releasing BWC footage.

Item 3 distribution wording: When making decisions about what BWC footage to release publicly, my department takes my well-being into account.

Three components possess high intercorrelation, while the remaining eight explain less variance than a single variable and so are removed. Taken together, discretion, disapproval, and distribution employ nine of our original 11 survey items. A secondary check of the remaining nine-item/three-component construction shows they each explain between 16.65% and 41.60% of the variance and together they explain 81.07% of the total sample variance, with the same component structure as predicted in the original analysis. Because measures of internal consistency increase as the number of construct components increases, two- and three-item constructions are more likely to have lower Cronbach's α values than more complex measures do (Cortina, 1993). Given that vulnerability, the high α values reported for discretion (0.8924), disapproval (0.8302), and distribution (0.9129) are especially impressive and well above the conventional 0.7 critical value (Cronbach, 1951; Santos, 1999). To further examine how individual components contribute to each construct, we turn to CFA using structural equation modeling.

CFA

We first evaluate the measurement model by constructing a CFA on the responses ($n = 191$) to the nine measurement items identified in the PAF analysis. As shown in the procedure note above, due to the ordinal nature of the variables (all seven-point Likert-type scales), the appropriate choice is to use ADF modeling (Newsom, 2015), which treats missingness in the data by dropping the related observation. This gives us a slightly smaller sample size in the model ($n = 191$) than FIML would ($n = 201$). The results of both modeling choices are approximately the same, and no path direction or significance level changes were observed. The confirmatory model structure is reported in Figure 1.

The CFA indicates the three-factor solution produces good model fit, $\chi^2(24) = 28.03$, $p > \chi^2 = .2589$; SRMR = Standardized Root Mean Square Residual (SRMR) = .030; Tucker Lewis Index (TLI) = .994; Comparative Fit Index (CFI) = .996; Root Mean Square Error of Approximation (RMSEA) = .03, 95% CI [.000, .068]. The configural model has good fit, and the standardized loadings from the indicators are between 0.75 and 0.93, well above the thresholds for acceptable magnitude of 0.6 to 0.7. A series of nested model tests gauge measurement invariance across the two agencies. We first test for weak factorial invariance by constraining the indicator path loadings in the nested model. The likelihood-ratio test results, $\chi^2_{diff}(6) = 5.45$, $p > \chi^2 = .4878$, of the constrained model nested within the configural model indicates that the model obtains weak factorial invariance. Next, the model was checked for scalar invariance, by testing whether both the factor loadings and the intercepts are invariant across the two groups (strong invariance). The nested model constrains the factor loadings and measurement intercepts for the two groups and is compared to the configural model. In comparison to the configural model, the result, $\chi^2_{diff}(15) = 20.65$, $p > \chi^2 = .1484$, confirms that the model retains scalar invariance across agencies. This result shows that the scale is preliminarily supported for use in different agency contexts.

Finally, a nested scalar model was used to test whether the configural model can be used across law enforcement respondents who wear BWCs and those who do not. For the scale development to be useful prospectively where BWCs are not already implemented, it is important to measure change in PIM between the pre- and postimplementation phases. While a longitudinal study of that sort is beyond the scope of this article, we are able to use maximum likelihood modeling with missing

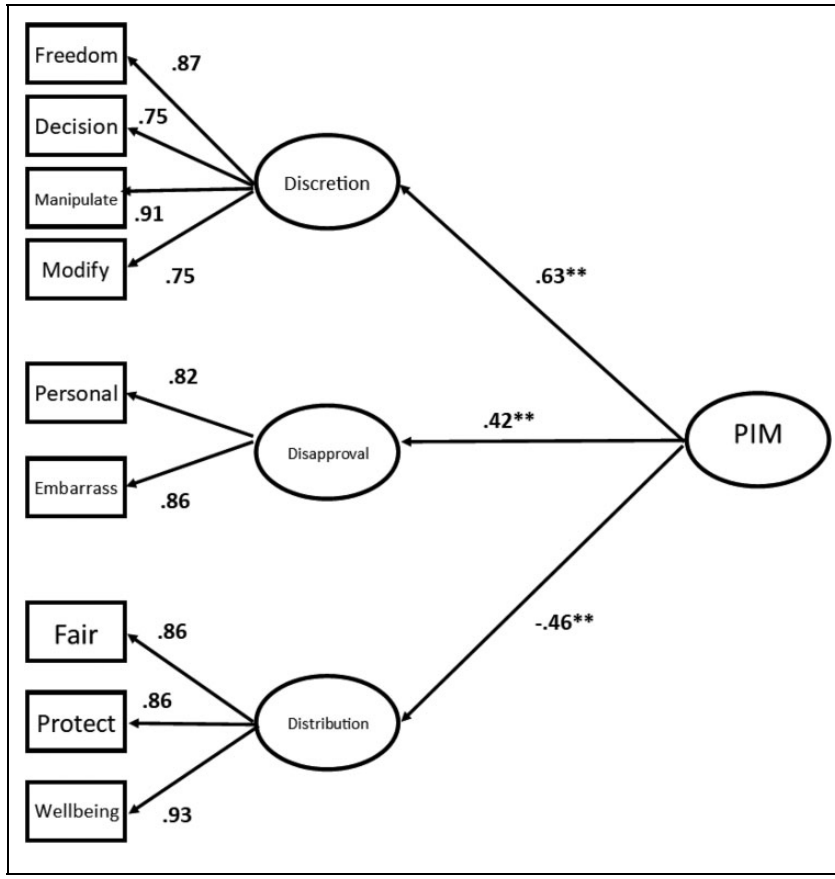

Figure 1. Perceived Intensity of Monitoring Scale confirmatory factor analysis. Significance for indicator to subscale paths all $p < .001$; ** significance at $p < .05$.

values to estimate model fit for a combined sample of both BWC and non-BWC-equipped law enforcement officers ($n = 600$). Respondents in the non-BWC pool answered questions that are measured in the disapproval and distribution factors, and missing value modeling allows the structural model to include perceptions of discretion through the BWC-equipped officers, all in one model. The model fit is good, $\chi^2(24) = 32.23$, $p > \chi^2 = .1215$; TLI = .994; CFI = .996; RMSEA = .024, 95% CI [.000, .043] (SRMR is not reported in missing value models). However, given the nature of using a FIML modeling procedure when it is not appropriate (as here, with ordinal measures), this final check should be considered suggestive rather than definitive (Newsom, 2015).

Discussion

The results of Study 1 show that the PIM Scale is a stable model of officers' perceptions of monitoring intensity. Further, the scale is invariant to changes in agency and is even useful in discriminating between the perceptions of monitoring by officers not currently equipped with BWCs and those who are.

The study confirms that officers' perceptions of intensity of monitoring delivered through BWCs can be modeled along three subscales. First, officers perceive that BWCs have a significant effect on

their professional discretion. As an officer perceives that a BWC reduces their discretion, the officer perceives greater intensity of monitoring. Second, officers perceive that BWCs pose a risk of public disapproval. As an officer perceives that a BWC risks greater public disapproval, the officer perceives greater intensity of monitoring. Finally, both discretion and disapproval measures are both theoretically related to the probability that any BWC footage at least has a chance of being distributed to the broader public. As an officer perceives greater unfairness in the distribution procedures, and less caring for the impact on her well-being, she experiences greater intensity of monitoring. This observation is related to long-understood conceptions of privacy, which recognizes that an individual does not have to know for a fact that they will be exposed to monitoring, the risk is enough to bring about negative changes in the individual's experience. The public represents an intense gaze, and "the more numerous those anonymous and temporary observers are . . . the greater his anxious awareness of being observed" (Foucault, 2012, p. 256).

Study 2: Validation SEM

In Study 1, we find the PIM Scale to be a useful measure with acceptable invariance across agencies and demonstrate that discretion, disapproval, and distribution predict the effects of PIM due to BWCs on burnout. However, CFA does not indicate whether the scale is of practical use to researchers. In Study 2, we employ the PIM Scale in a model explaining officer burnout.

Method

For the SEM, we employ the same configural model as reported and tested in Study 1, with an additional path from PIM to emotional exhaustion. Survey items capturing the emotional exhaustion aspect of burnout were selected as the dependent variable of interest due to the extensive literature on this aspect of burnout, and robust burnout-related results across a host of professions, with a particular focus on policing (Schaible & Gecas, 2010; Schaible & Six, 2016). Guided by previous research, including findings that demonstrate linkage between BWCs and officer burnout (Adams & Mastracci, 2018), we test the following Hypothesis in Study 2:

> **Hypothesis 1:** Officers who perceive higher intensity of monitoring will report higher levels of emotional exhaustion.

Procedure

A structural model is constructed to test the effect of the PIM Scale on a latent measure of emotional exhaustion. As noted in the procedure note for Study 1, due to the ordinal nature of the response variable, we select ADF modeling, which produces more conservative fit than modeling with maximum likelihood (Kline, 2015; Suhr, 2006). Although not reported here, a maximum likelihood model was checked as well, and the fit statistics were better than the already-good fit reported below.

Measures

The emotional exhaustion latent construct is comprised of 4 items: (1) Working with people all day is really a strain for me; (2) When I start my shift, I already feel emotionally exhausted; (3) I leave work feeling emotionally exhausted; (4) I feel "used up" at the end of the workday. All 4 emotional exhaustion items are measured with a 7-point Likert-type scale from *strongly disagree* to *strongly agree*. The mean for emotional exhaustion is 3.975, with a *SD* of 1.421 ($n = 553$). The Cronbach α measure for the 4-item construction is .8811.

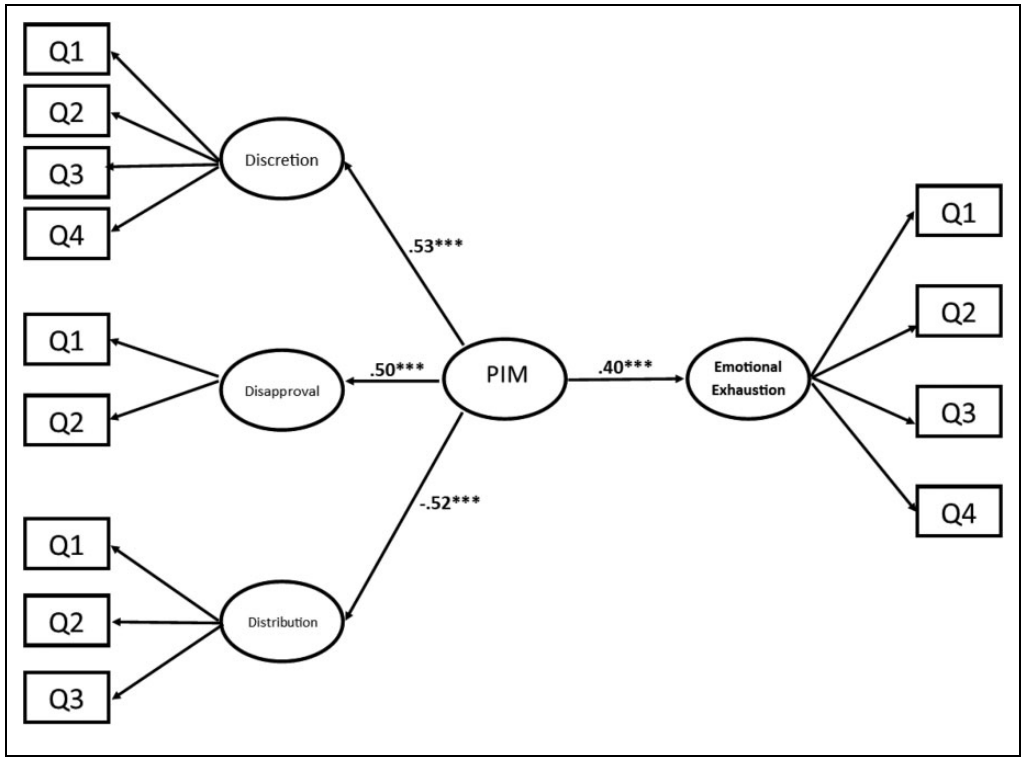

Figure 2. Structural equation model, Perceived Intensity of Monitoring Scale, and emotional exhaustion. Significance for observed paths all $p < .001$; ** significance at $p < .05$.

Results

The SEM for 179 participants had good model fit, $\chi^2(32) = 41.81$, $p > \chi^2 = .1149$; SRMR = .042; TLI = .987; CFI = .975; RMSEA = .041, 95% CI [.000, .073]. Due to how ADF modeling drops observations with any missing data, the model accounts for 179 participants rather than the total sample of BWC wearing officers ($n = 201$). ADF makes more conservative assumptions when testing ordinal data (Newsom, 2015) and is the correct modeling choice for these data. The structural model, path coefficients, and path significance are reported in Figure 2.

The model resolves with concurrent validity (compared to the unconstrained configural model from Study 1) as shown by the measurement paths on each of the three underlying components of discretion ($\beta = .51$, $p = .003$), disapproval ($\beta = .53$, $p = .002$), and distribution ($\beta = -.50$, $p = .002$). All paths are in the directions expected, are of similar magnitude, and retain the statistical significance found in the CFA. The coefficient on the path from PIM to emotional exhaustion ($\beta = .47, p = .000$) is in the direction expected—increases in the PIM are directly related to increases in reported emotional exhaustion—and is statistically significant.

We test discriminant validity by comparing a constrained SEM model—where the path between the three proposed factors (discretion, disapproval, and distribution) and the emotional exhaustion latent construct is constrained to one—to a second SEM model where the paths are free. A test of the robust χ^2 difference shows the freed correlation model performs best, $\chi^2_{diff}(3) = 82.86$, $p > \chi^2 = .000$. This result indicates the emotional exhaustion measure is related, but distinct from, the PIM construction.

Discussion

Results of the structural model allow us to reject the null hypothesis, and we find that emotional exhaustion is positively related to increases in how an officer perceives the intensity of monitoring among officers equipped with BWCs. As reported in Study 1, paths between the discretion, disapproval, and distribution subfactors are in the directions expected. As an officer perceives that wearing a BWC results in a reduction in his professional discretion, increases the risk of public disapproval, and unfair distribution practices, he perceives greater intensity of monitoring.

As suggested by disparate literatures in electronic performance monitoring, organizational justice, and police burnout studies, we locate a statistically significant, positive relationship between perceptions of the *intensity* of monitoring and emotional exhaustion. Using the standard accepted thresholds for evaluating standardized path coefficients (Shrout & Bolger, 2002; Suhr, 2006), the model shows a medium to large effect (.4) for the path between the PIM measure and the emotional exhaustion measure ($\beta = .47$, $p = .000$).

PIM Scale ($\alpha = .823$)

The preliminary evidence reported here suggests the PIM Scale is a reliable and valid measure of police officer perceptions of monitoring intensity. Measurement invariance tests indicate the PIM captures a phenomenon that occurs across police officers, both those who wear a BWC and those who do not. Tests using both CFA and SEM demonstrate the validity of the construct and that it is distinct from officer attitudes about BWCs in general. Further, the PIM Scale offers a valid and reliable measurement of the technological frame of BWCs, a result noted in recent work as a needed direction in BWC research (Newell & Greidanus, 2017).

Our finding of significant correlations between officer perceptions of both (1) the effects on discretion, disapproval, and distribution risks of BWCs and, (2) their measures of emotional exhaustion, lends additional weight to the importance of the ongoing debate and scholarship surrounding BWC policy. While short of demonstrating a clear causal linkage, we find no suggestion that the officers being assigned to wear a BWC is in some way linked to preexisting high measures of emotional exhaustion. Indeed, in Agency 1, all line officers and some investigative personnel are assigned the technology. This is at least suggestive that the correlation uncovered in the structural model has causal links, though demonstrating that fully will take more research.

As policy makers attempt to balance the privacy interests of their community members with the demands for police transparency and accountability, targeting the discretion of officers to activate their BWC is a common focus. At the same time, policy makers are responsible for maintaining healthy, capable police forces and retention of experienced officers is a crucial goal of police administrators. Our findings add to the information available to policy makers as they balance community demands for transparency against the well-being of police employees. Previous research has established the ability for perceived organizational support to mediate the relationship between BWCs and burnout (Adams & Mastracci, 2018). That finding suggests police administrators should take actions to demonstrate their commitment to officer well-being and provide multiple avenues of support both internally and externally, in order to provide a work atmosphere that ameliorates, rather than exacerbates, the already traumatic effects of police work (Galatzer-Levy et al., 2013).

In addition to the academic contribution, establishing the PIM Scale as a valid, reliable measure benefits both practitioners and scholars. Practitioners, such as police administrators and policy makers charged with making decisions to implement BWCs or craft policy regarding their use, can apply these measures to their specific contexts. Policy makers may profitably use our multifaceted concepts of discretion, disapproval, and distribution to interrogate their BWC policies. As national conversations continue around police use of force, oversight, and accountability, our findings

suggest that administrators concerned with the well-being of their staff should seriously consider how such a move might affect them.

Limitations and Future Research

This study contributes significantly to the BWC literature but carries limitations that must be considered. First, by virtue of being a proposed measure, the PIM Scale can be considered preliminarily supported only. In future research springing from an ongoing longitudinal project, we hope to validate the scale within the population of interest, but as of yet those results remain hypothetical. This limitation is inherent in any effort to expand the theoretical and empirical base of BWC research, which to date remains focused on synthesizing academic agreement on the ability of the technology to deliver on reduced police use of force, decreased citizen complaints, and increased police legitimacy. We note a further limitation borne from the research decision to base the study in two police agencies that inhabit the same county and share many demographic similarities. All research decisions involve trade-offs, and ours are no different. While the study gains validity in holding constant the demographic parameters, leaving BWC implementation as the theoretically significant variable differentiating the two agencies, at this time it is not known whether an agency with different underlying demographic characteristics would have similar results. On the one hand, these similarities control for context; but on the other hand, they may introduce weaknesses that can only be overcome through additional testing across different contexts. The development of the PIM Scale as a standard measure makes that endeavor more fruitful by providing a standardized measure to apply.

Related to the weakness above, this study is cross-sectional in design and so possesses methodological limitations related to that type of research. While the questions that frame the PIM scale were derived through conversation and experience with police officers, survey methods alone cannot capture the full experience of individuals. Experimental and interpretive techniques both hold promise for further research in the vein reported here. Specifically, experiments to investigate how policy differences that affect an officer's discretion to activate the body camera seem a promising avenue to test the theory that discretion is driving unequal outcomes in use of force and assaults on officers (Ariel et al., 2016a, 2016b). As BWC policy evolves, interpretive methods are critical to capturing the lived experience of officers and the meaning-making of learning to work as a police officer in an increasingly surveilled workspace.

More in-depth examination into officer experiences and activation policies represents two important frontiers of inquiry into the effects of police BWCs. Both involve officer discretion. First, research on emotional labor moves the discussion beyond the vagaries of personal control to the adverse outcomes associated with diminished autonomy. While emotional labor in public service can have affirming effects for public servants broadly (Guy, Newman, & Mastracci, 2008), high-stakes public servants experience some of the most deleterious effects (Mastracci, Guy, & Newman, 2012). Numerous scholars have identified policing as a particularly acute source of occupational stress (Crank & Caldero, 1991; Maslach, 2003, 2005), with later work establishing the contours of burnout in policing (Schaible & Gecas, 2010; Schaible & Six, 2016). Suicidal ideation (Berg, Hem, Lau, Loeb, & Ekeberg, 2003), increased acceptance and use of violence (Kop et al., 1999), and higher rates of substance abuse are just some of the more extreme outcomes of burnout in policing, while even the relatively less devastating effects such as family conflict and dissolution (Jackson & Maslach, 1982), and overall decreased physical health (Gaines & Jermier, 1983) warrant sustained scholarly attention as well.

Second, policy makers are considering different approaches to camera activation, all of which move the decision to activate a BWC further away from police officers and mainly without their input. "Holster activation" activates recording upon an officer drawing his firearm from the holster,

while "lights activation" does the same when an officer activates her patrol vehicle's emergency lights or siren. At the extreme end of policies intended to remove discretion is "door activation," which purportedly activates BWC recording upon officers opening their patrol vehicle door. Leveraging modern Bluetooth technology, any or all of these technologies can expand activation to any BWC within a specified distance, such that if any officer draws his weapon, activates her lights, or opens her vehicle door, all BWCs within say, 30 yards, would also activate.

While these policy evolutions may attain the goal of recording every possibly significant incident, they are just as likely to foster what we deem a "Panoptic Taylorism" in police service. Panoptic (Foucault, 2012) for the additional gaze—via the public, policy makers, media, courts, and agency administration—upon officers, who are constantly aware of the possibility of being watched, even if no one ever actually watches the recording. Taylorism for the stubborn ghost of early 20th century "scientific management" in public administration (Taylor, 2004; see also Waldo, 2017), which motivates the crafting of evermore detailed policy in the (unlikely) hope of imposing perfect order and outcomes on what is at its taproot a profession imbued with chaos. Such policies, when viewed through the lens of the findings reported here, should be examined carefully for how they may shift officer perceptions of fairness, particularly regarding effects on discretion, disapproval, and distribution concerns.

Finally, while we have demonstrated configural, weak, and strong invariance in the proposed PIM model, a final hurdle of strict invariance, which would demonstrate residuals in the model are invariant across groups and time, must be left to future research. Longitudinal studies would be ideal, and if the model demonstrates strict invariance at that level, or across many departments, which would suggest the PIM Scale can be collapsed into a single, additive measure (Newsom, 2015).

Conclusions

Policing is a uniquely undemocratic profession, and any attempt at real reform, whether technologically framed or not, requires we listen carefully to the voices of those who are charged with guarding our communities (Sklansky & Marks, 2008). With nearly 1 million citizens serving in law enforcement in the United States, if we are to understand the terrain of BWCs in policing properly, we must consider those voices and experiences carefully. We have reported initial empirical support for a broader theory of police perception regarding BWCs, articulated officer concerns over discretion, disapproval, and distribution of footage, and developed a valid scale measuring the PIM brought about by BWCs.

Recent research points to BWCs being used in non-policing and near-policing contexts such as railway stations (Ariel et al., 2019). Theory grants portability to empirical findings, and when "contexts differ across sites—public versus private interactions, field versus laboratory observations—theory is required to generalize from one to the other" (Coppock, 2018, p. 11). Our findings give new energy to considering critical questions facing scholars of the public workplace. The fair use of technology and data, equity for frontline public service employees, the ethics of both public and workplace surveillance, and the enduring question of how to improve community/police relations are all implicated in BWC policy. Development of the PIM Scale gives voice to the public servants charged with wearing a camera in the interest of public transparency, and their concerns about how BWCs affect their work, work lives, and well-being. Through careful measure and use, the PIM scale can be used to better understand the critical questions in ongoing BWC research better.

Declaration of Conflicting Interests

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Note

1. Additional descriptive information, including correlation heat map, univariate analysis for all measures, and missingness figures are available upon request from the corresponding author.

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