Urgent Issue Paper

Advancing police use of force research and practice: urgent issues and prospects

Craig Bennell[1]*, Geoffrey Alpert[2,3], Judith P. Andersen[4], Joseph Arpaia[5,6], Juha-Matti Huhta[7], Kimberly B. Kahn[8], Ariane-Jade Khanizadeh[1], Molly McCarthy[3], Kyle McLean[9], Renée J. Mitchell[10], Arne Nieuwenhuys[11], Adam Palmer[12] and Michael D. White[13]

[1]Department of Psychology, Carleton University, Ottawa, Ontario, Canada
[2]Department of Criminology and Criminal Justice, University of South Carolina, Columbia, South Carolina, USA
[3]Griffith Criminology Institute, Griffith University, Brisbane, Queensland, Australia
[4]Department of Psychology, University of Toronto Mississauga, Mississauga, Ontario, Canada
[5]Private Practice, Eugene, Oregon, USA
[6]Department of Couples and Family Therapy, University of Oregon, Eugene, Oregon, USA
[7]Police University College of Finland and Faculty of Education, University of Tampere, Tampere, Finland
[8]Department of Psychology, Portland State University, Portland, Oregon, USA
[9]College of Behavioral, Social and Health Sciences, Clemson University, Clemson, South Carolina, USA
[10]RTI International, Durham, North Carolina, USA
[11]Department of Exercise Sciences, University of Auckland, Auckland, New Zealand
[12]Vancouver Police Department, Vancouver, British Columbia, Canada
[13]School of Criminology and Criminal Justice, Arizona State University, Phoenix, Arizona, USA

Leading police scholars and practitioners were asked to reflect on the most urgent issues that need to be addressed on the topic of use of force. Four themes emerged from their contributions: use of force and de-escalation training needs to improve and be evaluated; new ways of conceptualizing use of force encounters and better use of force response models need to be developed; the inequitable application of force, and how to remediate biases, needs to be more fully understood; and misconceptions

*Correspondence should be addressed to Craig Bennell, Department of Psychology, Carleton University, 1125 Colonel By Drive, Ottawa, Ontario, K1S 5B6, Canada (email: craig.bennell@carleton.ca).
Other than the first author, who acted as project lead, all other authors contributed equally to the article and are listed in alphabetical order.

about police use of force need to be identified and corrected. The highlighted topics serve as an agenda for future research. Such research should provide greater insight into when, where, and why force is used by police officers, and how it can be applied appropriately. If implemented, the practical recommendations included in the contributions should have a positive impact on police performance, public trust and confidence in the police, and citizen and officer safety.

Advancing Police Use of Force Research and Practice: Urgent Issues and Prospects

Currently, the use of force by police officers is arguably getting more attention than any other issue in policing. Recent incidents in Canada (Barrera, 2020), the United States (US; Sanchez, 2020), and elsewhere (Gordon, 2020) have led to renewed calls for change in how the police use force, especially against members of racialized communities. The ease with which police–citizen encounters can now be recorded and scrutinized on social media has also reinvigorated debates about the use of force (Goldsmith, 2010). Often armed with footage of these encounters, the public, politicians, academics, the media, even police officers themselves are asking important questions: How frequently do the police use physical, particularly lethal, force? Why is force sometimes used instead of attempts to de-escalate encounters? Is force being applied disproportionately to certain groups, in particular racialized groups? Do police officers receive adequate use of force and de-escalation training? Are reforms needed to reduce use of force by police and, if so, how can these changes be facilitated?

Research related to police use of force has grown considerably over the last few decades, but researchers still struggle to provide clear answers to these questions. This is not to say that good research has not shed some light on these and other issues; only that significant research gaps still exist. The current public outcry over recent citizen deaths at the hands of police officers speaks to the urgency with which these gaps must be filled. Only then will police scholars and practitioners be able to adequately address the questions being raised. It is thus very timely that the contributors to this article were brought together to provide their insights into fundamental issues related to police use of force that they feel require immediate attention.

Like the previously published papers in the *Urgent Issues and Prospects* series, leading scholars and respected practitioners from around the world were asked to reflect on issues that need to be tackled on the topic of use of force. More specifically, practitioners were asked, 'As a practitioner, what question/issue related to police use of force do you wish research would address?' Academic contributors, on the other hand, were asked, 'In your view as a researcher, what is the most urgent, unsolved question/issue related to police use of force?' The commentaries below speak to research topics that need to be prioritized.[1] They also provide recommendations for changes to policing that will hopefully result in positive outcomes. Following the commentaries, concluding thoughts are presented.

---

[1] *We recognize from the outset that some of the issues discussed in the commentaries will not be equally applicable to all jurisdictions (e.g., access to firearms, availability of body-worn camera technology, etc.). Readers should keep this in mind as they consider the implications of the research topics highlighted by the contributors.*

Commentary #1 by Judith Andersen, PhD, and Joseph Arpaia, MD: Police Officers Must Receive Training That Enables Them to Modulate Their Physiologic Response to Stress

Police officers experience internal stress physiology during training and active duty, with negative implications for decision-making and use of force errors (Andersen et al., 2018; Anderson, Litzenberger, & Plecas, 2002; Baldwin, Bennell, Andersen, Semple, & Jenkins, 2019). Therefore, one of the most urgent unaddressed issues is to provide training to officers that would enable them to modulate their physiologic response to stress in a way that would reduce use of force errors without leaving them vulnerable to personal injury.

During a threatening or potentially conflictual encounter, an officer's autonomic nervous system (ANS) coordinates a powerful physiologic response. This physiologic response alters perception, thought, and behaviour in order to maximize the officer's immediate safety. Specifically, the parasympathetic nervous system (PMP), which is responsible for recovery, repair, and focused attention, is suppressed within milliseconds (Fridman, Barrett, Wormwood, & Quigley, 2019). This allows for unchecked activation of the sympathetic nervous system (SMP), which readies the body for fight or flight (i.e., increased respiration, heart rate, glucose, etc.). The unchecked activation of SMP results in decreases in cognitive processing, sensory awareness, conscious control, accurate time perception, and fine motor control (Burke, 2017). SMP arousal in the absence of PMP is beneficial for purely physical tasks such as running or fighting. However, other skills such as communication and response inhibition are less effective when PMP is suppressed (Arble, Daugherty, & Arnetz, 2019; Spangler, Gamble, McGinley, Thayer, & Brooks, 2018).

Research indicates that officers can be trained to modulate their ANS by increasing PMP in high-stress situations, including use of force encounters. This will improve cognitive and behavioural responses. Like other police skills, such as the use of weapons and tactics, training to modulate the ANS must be practised until the skill becomes intuitive and thus unlikely to disappear during stressful encounters (Arble et al., 2019). Training must include physiologic Recognition and Reset:

> Step 1: Train officers to recognize the physiologic signs of ANS imbalance by exposure to scenarios designed to evoke physiologic changes similar to those encountered in the line of duty (commentary #2). Wearing equipment that provides immediate physiologic feedback (1–2 seconds lag time) is the most rapid way to train physiologic awareness. The equipment alerts the officer of their internal state so they can note specific sensations associated with ANS imbalance and engage in reset and refocus. Physiologic alerts should only be done in training, not in the field where they may be distracting.

> Step 2: Physiological reset and refocus. The most common ANS imbalance associated with errors is high SMP and low PMP activation. Increasing PMP immediately will augment cognitive and decision-making skills. One simple method for increasing PMP within seconds is to use a 'reset breath' (Vlemincx et al., 2013), also called a pursed lips breath or prolonged exhalation.

ANS imbalance is NOT corrected by reducing SMP or relaxing, as occurs in 'combat breathing' (Röttger, Theobald, Abendroth, & Jacobsen, 2020). Rather, the reset breath activates the PMP without reducing the necessary SMP. The increased PMP causes a change in brain function, which provides a brief window of opportunity for the officer to refocus their attention enabling the officer to regain situational awareness and focus on the resources available to help them meet the demands of the situation. The refocus is required in order for the officer to respond appropriately. The reset and refocus steps can

be repeated frequently, giving the officer the ability to maintain ANS balance, or readiness, for an extended period of time. For the reset-refocus to become automatic, officers must be trained to activate PMP successfully in a variety of contexts and environments. The increased PMP that comes from the reset breath improves social skills enabling the officer to naturally project a more helpful presence that can enhance relationships with community members. Research on the integration of the physiological reset and refocus technique into de-escalation and use of force training is recommended as a means of improving police–community interactions.

Commentary #2 by Arne Nieuwenhuys, PhD: Representative Practice to Improve Police Officers' Performance of Operational Skills in High-Stress Situations

In their work, police officers are bound to come across situations where they have to perform complex operational skills under high levels of stress (Anderson et al., 2002). Although police officers may be well-trained and are recruited based on their stress-resistant personalities (e.g., Landman, Nieuwenhuys, & Oudejans, 2016), in response to high threat, they do show human stress responses; their attention gets biased towards threat-related information, environmental cues are more likely to be interpreted as threatening, and their motor system gets primed for action (Nieuwenhuys & Oudejans, 2012, 2017; commentary #1). Each of these responses holds the potential for error. Consequences of error-making can be large and public opinion regarding police officers' performance is often unforgiving. An urgent question that needs to be addressed, therefore, is 'what can we do to increase police officers' level of preparedness and further optimize their performance, particularly in high-stress situations?'

Pertinent to the performance of operational tasks (e.g., arrest and self-defence skills, handgun shooting), the effective control of movement requires integration of lower levels of control (e.g., neurophysiological structures to produce the movement) and higher levels of control (e.g., executive functions to control the movement) to ensure that motor skills are flexibly adjusted to the various internal and external conditions under which they may need to be performed (Bernstein, 1996). Flexibility in skill execution is critical to adaptive behaviour in real life and – whilst it emerges naturally over time – its development can be expedited through *representative practice* (Pinder, Davids, Renshaw, & Araújo, 2011); a constraints-led approach to motor learning in which relevant conditions that are present during performance in real life are deliberately implemented ('represented') in practice. Arguably, representative practice is especially important when relevant performance conditions only occur naturally on an incidental basis (e.g., as with high stress; Oudejans & Nieuwenhuys, 2009). In support of this viewpoint, a significant body of research has shown that implementing real-world stressors in the training and practice of operational skills effectively improves performance in subsequent high-stress situations, including for police officers (Low et al., 2020). As such, the question is not *if* police officers should engage in representative practice of operational skills, but *how* to implement this most effectively.

Acknowledging that representative practice can improve performance of operational skills in high-stress situations, key challenges for practical implementation are (1) identifying relevant internal and external conditions that cause stress during skill performance in real life, (2) identifying safe and effective means of representing those conditions in practice, and (3) developing programmes that introduce training under

high-stress *after* the basic motor skill is firmly established and that provide the opportunity for sufficient exposure to allow acclimatizing of the existing skill to the targeted conditions (Oudejans & Nieuwenhuys, 2009; Pinder et al., 2011).

Regarding future research, because stress impacts higher-order control structures required to maintain flexibility in skill execution (Nieuwenhuys & Oudejans, 2012, 2017), a key challenge will be to identify strategies that improve executive functioning. In this regard, future research may (1) explore the added benefits of working memory training (e.g., inhibition training; Ducrocq, Wilson, Smith, & Derakhshan, 2017) to improve the effectiveness of deliberate attempts at goal-directed control, (2) examine the effectiveness of implicit learning strategies (Masters, 1992) to protect against stress-induced 'reinvestment' (Masters & Maxwell, 2008), and (3) identify work arrangements and self-regulation strategies that promote recovery and protect against additional negative effects of work-related fatigue and insufficient sleep (e.g., Van Peer, Gladwin, & Nieuwenhuys, 2019).

In conclusion, representative practice helps to increase police officers' level of preparedness and optimize their performance in high-stress situations by promoting flexibility of skill execution. Focus on implementation and locking-in gains through complementary (learning) strategies, as suggested in this contribution, will help to achieve this.

Commentary #3 by Michael White, PhD: Can Training Change Officer Perceptions and Use of De-escalation?

Since 2014, police de-escalation training has received widespread attention as a method for reducing excessive use of force (President's Task Force on 21st Century Policing, 2015).[2] The deaths of George Floyd, Breonna Taylor, and others in the summer of 2020 have amplified calls for police to receive training in de-escalation (Brumback & Rico, 2020). Though it has diffused widely in policing (McKesson, Sinyangwe, Elzie, & Packnett, 2016), there is virtually no research on de-escalation. Engel, McManus, and Herold (2020a) recently completed a multidisciplinary systematic review of de-escalation training over a 40-year period (1976–2016) and identified no evaluations of de-escalation in criminal justice or policing. In plain terms, we know little about what it is, what it includes, and whether it is effective.

Recently, the Tempe (AZ) Police Department (TPD) and researchers at Arizona State University received funding from the U.S. Department of Justice to design, deliver, and evaluate a de-escalation training programme. The central question addressed by the project is whether training can change officers' perceptions and use of de-escalation. Tempe's one-day curriculum draws on other available trainings and research, as well as the local expertise of Tempe's 'top de-escalators' who were nominated by their peers. The training was delivered in February–March 2020 via a randomized controlled trial.

The evaluation of the training included officer surveys about the importance and use of de-escalation, as well as an analysis of body-worn camera (BWC) footage. The surveys were administered seven months before and four months after the training. Officers rated the importance of 18 de-escalation tactics on a scale from 0 to 3 (0 = not important; 1 = somewhat important; 2 = important; 3 = very important). Officers then rated how frequently they use each tactic (0 = not at all; 1 = rarely; 2 = once per week; 3 = once per

Table 1. De-escalation tactics: importance and frequency of use

Outcome (importance of de-escalation tactics)	Mean trained	Mean not trained	Difference
Patience	2.7	2.8	−0.1
Communication	2.8	2.9	−0.1
Listening	2.8	2.9	−0.1
Compromise	2.0	1.3	0.7*
Non-threatening body language	2.2	1.8	0.4
Staying calm	2.7	2.8	−0.1
Empathy	2.4	2.1	0.3
Knowing when to request back-up	2.7	2.6	0.1
Knowing when to call a supervisor	2.2	2.0	0.1
Knowing when to use force	2.9	2.8	0.0
Knowing when not to use force	2.9	2.9	0.0
Using proper tactics	2.9	2.7	0.2
Maintaining officer safety	2.9	2.7	0.2
Knowing when to walk away	2.7	2.6	0.0
Using appropriate wording and language	2.5	2.2	0.3
Speaking in a calm manner	2.4	2.3	0.0
Keeping appropriate personal space	2.4	2.1	0.3
Maintaining eye contact	2.0	2.0	0.0
Outcome (frequency of use)			
Patience	3.9	3.5	0.4
Communication	4.0	3.7	0.3
Listening	4.0	3.7	0.3
Compromise	3.5	2.5	0.9*
Non-threatening body language	3.7	3.2	0.5
Staying calm	3.9	3.6	0.3
Empathy	3.6	3.3	0.3
Knowing when to request back-up	3.4	2.3	1.1
Knowing when to call a supervisor	2.6	2.1	0.5
Knowing when to use force	3.2	2.7	0.5
Knowing when not to use force	3.3	2.8	0.5
Using proper tactics	3.9	3.3	0.7
Maintaining officer safety	4.0	3.2	0.9*
Knowing when to walk away	3.5	2.4	1.0*
Using appropriate wording and language	3.8	3.3	0.5
Speaking in a calm manner	3.9	3.5	0.4
Keeping appropriate personal space	3.8	3.0	0.8
Maintaining eye contact	3.5	3.0	0.6

Note. *$p < .05$, **$p < .01$, ***$p < .001$.

shift; $4 =$ multiple times per shift). The focus here is on the post-training survey results only.[3]

Officers in both the training and control groups rated most de-escalation tactics as important (mean scores of 2.0 or above; Table 1). Only one statistically significant group difference emerged: trained officers placed greater value on compromise. Officers in both

---

[3] *Group differences in officer race/ethnicity, sex, length of service, and pre-training attitudes toward de-escalation were controlled for in an econometric random-effects model.*

groups reported using many de-escalation tactics one or more times per shift (mean scores of 3.0 or above). Three group differences reached statistical significance: compromise, maintaining officer safety, and knowing when to walk away.

The evaluation also included a post-training examination of randomly selected BWC footage for 246 encounters between citizens and officers (treatment [n = 150]; control [n = 96]), with a specific focus on actual use of de-escalation tactics. Officers who received the training were significantly:

- less likely to use a condescending/patronizing tone with the citizen;
- more likely to attempt to build rapport with the citizen;
- less likely to fail to transfer control to another officer, if necessary;
- less likely to use charged/imposing body language (e.g., unnecessarily having their hand on their firearm); and
- more likely to resolve the encounter informally, especially not issuing a ticket/citation.

Three themes emerged from the results. First, all officers in the TPD value and frequently use de-escalation. In that sense, it was difficult for the new training to 'move the needle' on de-escalation since it is an already accepted and widely used set of tactics. Second, the training altered attitudes and reported use of three tactics, two of which run counter to the traditional police mindset (compromise, knowing when to walk away) and one that refutes a common criticism of de-escalation (maintaining officer safety).

Traditional police training emphasizes the importance of maintaining control of a situation. Compromise is akin to relinquishing some police authority. Yet, emerging research on de-escalation highlights the importance of compromise for peacefully resolving encounters (Todak & White, 2019; White, Mora, & Orosco, 2019). Moreover, knowing when to walk away is traditionally perceived as retreat, which is shunned in police training. The Tempe training viewed this tactic as a way to gain more time, to 'tap out' in favour of another officer, or to disengage because it is not a police problem. Officers who received the Tempe training reported greater use of these non-traditional de-escalation tactics.

Critics of de-escalation argue it increases the risk of injury because officers will hesitate to use force (Engel, Corsaro, et al., 2020a). Maintaining officer safety is paramount, and it is a central feature of the Tempe de-escalation training. The training's focus on officer safety translated into greater reported use of tactics designed to reduce risk to officers and citizens. This important finding responds directly to one of the most serious criticisms about de-escalation.

Third, the training led to increased use of several important de-escalation tactics, from attempts to build rapport to important changes in verbal and body language. All of these findings are statistically significant and suggest the training substantially increased officers' use of de-escalation.

We have begun to make some progress in terms of understanding the potential impact of de-escalation training. The Tempe study, and other recent research (e.g., McLean, Wolfe, Rojek, Alpert, & Smith, 2020), shows that de-escalation training can influence officer attitudes and self-reported behaviours. However, there are two important questions moving forward. First, can de-escalation training alter *actual* officer behaviour? Few studies have tested this question and results are mixed. While some research shows no impact on officer behaviour (McLean et al., 2020), other research shows behaviour change, including reductions in use of force, citizen injuries, and officer injuries (Engel, Corsaro, Isaza, & McManus, 2020b). The mixed findings may be tied to difficulty in measuring rare outcomes. This study measured behaviour change through greater use of

de-escalation tactics, captured via examination of BWC footage. Additional research on this question is urgently needed, and researchers should take a broad approach to conceptualizing behaviour change. Use of force, complaints, and injuries may be too blunt as measures of impact, especially in departments that have low rates of those outcomes. Second, what are the core components of effective de-escalation training? There is substantial variation in the content of different trainings. As the evidence base grows, researchers need to open the 'black box' of de-escalation training to identify those elements that are essential to generating positive change in officers' attitudes and behaviour.

Commentary #4 by Sergeant (retired) Renée J. Mitchell, PhD, JD: Understanding Police Use of Force as a Complex System

Use of force is not a unilateral event. Yet, advocates, politicians, and often researchers judge and evaluate use of force events by examining police behaviour in efforts to limit or control negative use of force outcomes (Prenzler, Porter, & Alpert, 2013). Advocates call for legislation to create stronger police accountability laws and defunding of the police (Alcorn, 2019; Russonello, 2020). Researchers examine whether changing police policy, training, reporting, or discipline will reduce use of force incidents (Davis, 1969; Pate & Fridell, 1995; White, 2001). Every police officer can attest to the latest training focused on Principled Policing, Transformational Policing, Procedural Justice, Implicit Bias, De-escalation, or the latest training focused on reducing use of force incidents. Use of force continuums are extensively studied to evaluate the extent to which they are used (McEwen, 1997), how they are designed (Terrill & Paoline, 2013), and where certain intervention options fit within them (Alpert & Dunham, 2010). This police behaviour-focused approach is understandable; organizational policies, use of force training, reporting systems, and disciplinary procedures can only be created for the police, not the public. However, this does not mean that this perspective is how we should examine processes or outcomes in police–citizen encounters where force is used by the police.

A use of force incident is a complex system, one that emerges from collective behaviour between two or more people. Yet, we still tend to study only one side of that collective behaviour – 'What did the officer say?', 'What weapon did the officer display?', 'How did the officer's body language look?' (Klinger, 2001; Leen & Horwitz, 1998; Stewart, 2009). By doing this, we are missing a large piece of the puzzle, which is necessary to better understand the use of force by police. What should be studied are the interactions that occur between the police and citizen's behaviour, which can ultimately result in a use of force incident (e.g., Kahn, Steele, McMahon, & Stewart, 2017; Longridge, Chapman, Bennell, Clarke, & Keatley, 2020). We need to explore how the citizen's verbal and non-verbal reactions to the officer's verbal and non-verbal reactions emerge to create a situation in which the resulting event is the use of force. Complex events are emergent; at each shift in an interaction, new emergent structures of that interaction form and engage in new emergent interactions (Waldrop, 1993). We should be deconstructing these engagements not through the use of body-worn camera footage, but through third-party video where neutral observers can see and hear all the parties involved. This will allow us to better determine how use of force events emerge out of police–citizen contacts – not unilaterally, but collectively.

Examining complex systems to understand how they emerge, especially potentially antagonistic interactions such as police–citizen contacts, is not an easy task. Changing

policies or training, and demanding police accountability is much easier. But, the task can be achieved. Researchers could create a tool to evaluate both sides of police–citizen interactions. The tool cannot be biased towards the citizen or officer, which means the tool would have to account for a citizen's unwillingness to comply or de-escalate no matter the efforts of the officer (commentary #5). This is the measure most often missing from politicians, advocates, and the media's accounts of police–citizen interactions (Lancaster Online, 2020). Sometimes, there is nothing an officer can do but resort to the use of force and that sometimes has to be evaluated as (1) an acceptable outcome of a complex system, (2) a failure of the citizen to abide by the social contract, and (3) *not* a failure on an officer's part to de-escalate the situation. A proper tool for evaluating police–citizen interactions bilaterally should be created by amalgamating communication research for both verbal and non-verbal measures, validated through third-party video of police–citizen interactions.

Commentary #5 by Chief Inspector Juha-Matti Huhta: Use of Force Needs to be Understood as a Process, Not Just an Outcome

Police use of force is often studied (and covered in media) too reductively. This is a mistake. The use of force by police should be studied in such a way that the situation as a whole is taken into account (e.g., what happened before the encounter, what occurred during the encounter, the presence of potential stressors, the training given to the police, etc.). Part of this will require a shift away from focusing on outcomes of encounters (e.g., whether a weapon was fired), to pay more attention to the processes involved in managing potential use of force incidents (as recently recognized by researchers; e.g., Bertilsson et al., 2019 and Di Nota & Huhta, 2019). The outcome of an encounter is not a sufficient indicator or parameter to demonstrate the effectiveness of policing, the competence of an individual police officer, or the appropriateness of their training. In general, the end result may be good (e.g., no injuries or deaths occurred) even if an officer's performance has included numerous errors, including those affecting bystander safety. On the other hand, despite the fact that the police handle an encounter as they should, the outcome may not be optimal for the subject, bystanders, or even the officer. What's more important is the process.

Naturally, training related to police use of force can also be carried out in the same reductive fashion, as is done in sports (e.g., motor exercises can be practised in an isolated environment so that motor skills develop, like what is done on the range for the purpose of developing basic firearms skills). While this may be understandable at the beginning of one's training, eventually officers will need to learn how to handle entire situations, including the management of individual stressors and their impact on observations, decision-making and motor skills, and other factors affecting the officer's situational awareness. Training scenarios must allow officers to develop, and most importantly integrate, these skills (something that appears to be underemphasized in use of force training at the moment; e.g., Lewinski, 2019). For example, consider a scenario involving a person behaving violently who is injuring and trying to kill people in a shopping centre parking area. In this case, the legal conditions for the use of a firearm are likely to exist, but whether an officer is able to use a firearm depends on the way he or she succeeds in their tactical thinking and their own placement (i.e., their situational awareness). The officer cannot, in principle, use a firearm if there are bystanders behind the target person. The officer must take into account the environment, including the placement of bystanders in

relation to the target person and the officer, and in this way try to enable the most effective use of force, up to and including a firearm.

Evaluations of officers during training must also focus on de-escalation and use of force as a process, rather than just focusing on the outcome of an encounter. In most scenarios, there is no unequivocally 'right or wrong' or 'good or better' model of action and way to use force. While the objective in every serious incident is to stop the dangerous activity of the most dangerous person to avoid further harm, injuries, or casualties, the question of what's 'right' is always about the assessment of each unique situation in its entirety. The potentially unique responses to the use of force incident are what should be assessed during officer training evaluations, and this is how use of force events should be examined by researchers who study them.

Commentary #6 by Kyle McLean, PhD, and Geoffrey Alpert, PhD: Moving from Resistance-Based Use of Force Models to an Emphasis on Threat, Risk, and Necessity

Police officers are given wide discretion and considerable protection to use force against citizens in pursuit of enforcing the law and maintaining the peace. While the average citizen may only use violence against others when justified through defence of self or others, police officers are authorized to use violence to effect an arrest, to gain compliance with a lawful order, and in defence of self or others. This incredible authority serves the public by the use of social and physical control to protect citizens from victimization.

While the use of force is an infrequent act (Adams, 1999), it is one that impacts people and communities more than any other. The killing of George Floyd in 2020 and the subsequent protests and riots demonstrate the impact one use of force event can have on the community. In response to the unjust killing of unarmed African Americans across the United States, citizens have once again called for changes to policing. Tactics for changing officer behaviour primarily occur through either (1) changes in training (e.g., commentary #1–3, #7) or (2) changes in policy (e.g., commentary #7).

Here, we focus on changes in policy to alter officer behaviour. While we do not wish to diminish the role of training in improving officer use of force decisions, it is our belief that effective reforms to the police MUST target BOTH training and policy. To be clear, training alone, regardless of quality, without accompanying changes to policy to hold officers accountable for not following training, is likely to fail. Similarly, policy changes alone, without accompanying training to help officers comply with the policy, are likely to fail as well.

Use of force, or response to resistance policies, is the administrative standard by which force is evaluated. It is reported by the Bureau of Justice Statistics (2020) that more than 90% of the 18,000 agencies in the United States have policies to guide their officers in the application of force, including its levels and tools. While many of the policies have been written recently, there are too many that have not been revised and are out of date.

Commonly used use of force continua are insufficient to depict adequately the complexities of use of force encounters (commentary #4-5). Use of force continua suggest appropriate levels of force for officers to use based on the perceived level of resistance presented by subjects (Klockars, 1985; Nowicki, 2001). In its original format, levels of force were placed in ascending order next to ascending levels of resistance to show officers how situations could escalate or de-escalate. More recent versions of the continuum, called the force options model, place levels of force and resistance in a circle rather than in a linear model to avoid logical failures that force must escalate or de-escalate in a linear manner.

Importantly, use of force policies that accentuate resistance ignore legal standards set forth in *Graham v. Connor* (1989) that require force to be based on the totality of the circumstances (Stoughton, Noble, & Alpert, 2020). Consider a frail, elderly male who is being escorted by a much larger and younger officer after being arrested for a relatively minor crime (e.g., shoplifting) when the subject turns and pushes the officer. Here, there may be active resistance, which could be met with a take down or even a Taser by the officer under many use of force continua and policies. However, does this elderly male pose a threat to the officer that justifies such a violent response? Is the subject likely to be able to get away from the officer and pose a risk to the community? Is it necessary or even reasonable to use this level of force? We think not.

Accordingly, we suggest that policing move from a resistance-based model of use of force policies, to a model that considers the risk presented by subjects and the necessity of force. Some departments have begun to explore this possibility with excellent examples being seen in the Threat Exposure Necessity Response (TENR) Model employed by the New Zealand Police (n.d.). TENR does not remove the possibility of using force or the requirement that force be proportional to the situation, but it requires officers to consider the threat and exposure presented in a situation to determine if intervention is necessary at this time. Returning to the old man in the scenario presented above, TENR would likely reveal that the officer and the community are at no risk from the subject and that minimal force is all that is justified to take him back into custody.

Training officers to de-escalate potential use of force situations or to mitigate the impact of stress on use of force situations is important (commentary #1-3). However, without policy requirements that emphasize the analysis of threat, risk, and necessity, officers are unlikely to put training into practice by considering alternatives to the use of force or the need to use force. Clearly, research efforts should consider the junction of policy and training to effectively reduce the use of force. Rather than traditional studies that decompose interventions into policy changes (e.g., Shjarback, White, & Bishopp, 2021) or training programmes (e.g., McLean et al., 2020) in an attempt to identify the correct 'cause', research should focus on how policy changes accompanied by training interventions may be more effective than either intervention considered independently.

Commentary #7 by Kimberly Barsamian Kahn, PhD: Racial Bias in Police Use of Force Must Be Addressed

Racial disparities in police use of force undoubtedly exist. Across numerous metrics, racial minorities in the United States are more likely to receive, and be killed by, police use of force compared to White individuals. Compared to White Americans, Black Americans are more than twice as likely to be killed by police when unarmed (Nix, Campbell, Byers, & Alpert, 2017). Similar bias exists at non-fatal force levels, including Tasers (Goff, Lloyd, Geller, Raphael, & Glaser, 2016). What is urgently needed is better measurement, understanding, and ways to remediate racial disparities in police use of force.

First, in order to understand the scope of the problem, the United States needs a standardized national database that accurately tracks police use of force, including fatal force, which is currently lacking (Goff & Kahn, 2012). What is measured, matters. By not having basic metrics, researchers and police departments are hindered in their ability to study and remediate racial disparities. Rudimentary questions such as, how a department's force compares to the national average, or to comparable cities, cannot be answered currently due to lack of good data.

Second, more research is needed to identify sources of racially disparate outcomes in police use of force. What proportion of racial disparities originates from policing (e.g., police officers, policies, and practices) and what can be attributed to broader societal inequalities (e.g., education, housing, poverty)? Focusing on policing, at the individual level, officers' explicit attitudes, which are consciously endorsed and acknowledged beliefs, can influence behaviour with racial minorities through intentional actions. Implicit attitudes, which occur underneath one's awareness, can similarly influence behaviours in subtle ways, despite a lack of intentionality (Kahn & Martin, 2020). The characteristics of use of force situations themselves – necessitating fast decisions with large amounts of stimuli in stressful environments – make it more likely that implicit stereotypes are relied upon (Fazio & Olson, 2003). At the departmental level, policing policy, practice, and culture also affect use of force behaviours and disparate outcomes. How and where officers are deployed, and the types of training, use of force policies, and cultural norms within a department influence an officer's likelihood of using force and against whom (Kahn & Martin, 2020). Refining our knowledge of the source of racial bias in police force helps to identify risk factors, and how and where to intervene.

Finally, more research is needed to identify effective ways at reducing bias in officers' deployment of force. Within policing, remediating racial bias must target multiple levels and sources, and not be siloed. While officer debiasing training, including implicit bias training, is often instituted as a treatment, it is unlikely to be effective alone. Implicit attitudes are hard to change, requiring persistence, motivation, and dedication to long-term change (Lai et al., 2016). While it can represent a step in a larger racial equity plan, interventions should also focus on departmental policies and practices. Emphasis should be on providing effective strategies to manage behaviour, making stereotypes less influential on one's thinking. This includes clear use of force policies that reduce discretion, as ambiguity invites stereotypes to affect decision-making (Hilton & Von Hippel, 1996). Police training should emphasize de-escalation techniques in order to reduce the likelihood for force to be deployed (commentary #3). Beyond training, community policing, in which police officers spend time developing relationships within diverse communities, can increase positive intergroup contact between officers and community members and help break down stereotypes (President's Task Force on 21st Century Policing, 2015; commentary #8). Community policing can also help address the lack of trust racial minorities often have towards police (Tyler, 2005), stemming from the historical legacy of biased policing. Procedural justice approaches in policing, which focus on fairness, transparency, respect, and voice in decision-making (Tyler & Huo, 2002), may similarly improve trust in police and police–community relations. Finally, strong accountability measures, including body-worn cameras, can also promote equitable behaviours. There must be commitment to institutional change across all levels within policing for there to be true systemic reform. Research needs to aid this process by providing evidenced-based, effective interventions to address racial bias in police use of force.

Commentary #8 by Molly McCarthy, PhD: Can the Influence of Power on Social Distance Explain the Uneven Distribution of Police Use of force Across Communities?

Police use of force has been found to be unevenly distributed across communities and is most commonly concentrated in lower socio-economic, racially heterogeneous, and higher violent crime communities (Lee, Vaughn, & Lim, 2014; McCarthy, Porter,

Townsley, & Alpert, 2018; Smith & Holmes, 2014; Terrill & Reisig, 2003). While a diverse range of theories and concepts has been applied to explain the concentration of police coercion in different ecological contexts, including ecological contamination, minority threat theory, and social disorganization (McCarthy et al., 2018; Smith & Holmes, 2014; Terrill & Reisig, 2003), a unifying theory explaining the ecological distribution of police coercion remains absent and is urgently needed.

The social distance theory of power, proposed by Magee and Smith (2013), can provide additional explanatory value, enabling a unifying theoretical framework through which the ecological distribution of police coercion can be explored. Here, social distance is the degree of psychological distance one feels from another person, or the perceived distance or distinction between one's own and others' group identities (Lammers, Galinksy, Gordijn, & Otten, 2012; Magee & Smith, 2013). This theory suggests that in the context of asymmetric power relationships, individuals with greater power will perceive increased social distance from lower power individuals. Perceptions of social distance have been found to impact cognition, affect, and behaviour in ways that may provide fertile conditions for expressions of aggressive or callous behaviour (Magee & Smith, 2013).

This theoretical framework could be applied to understanding how police interact with the public in general, where police inherently have greater power to influence outcomes in most interactions (McCarthy, Porter, Townsley, & Alpert, 2020). However, it is likely to have even more explanatory power for understanding police behaviour with individuals in communities that have relatively low social or economic power, where power differences between police and citizens may be more acute (Black, 1976; McCarthy et al., 2020).

Social distance can influence individuals' cognitive, emotional, and behavioural responses. Cognitively, social distance can promote more abstract construal of others and greater use of stereotypes to understand behaviour (Magee & Smith, 2013). Emotionally, social distance can lead to greater experience of socially disengaging emotions such as anger and contempt and reduced experience of socially engaging emotions, such as empathy and guilt (Magee & Smith, 2013). Additionally, social distance in hierarchical relationships may prompt greater aggression, when higher power individuals are not provided with perceived commensurate respect from lower power individuals (Foulk, Lanaj, Tu, Erez, & Archambeau, 2018; Magee, 2020). Collectively, these impacts of power on social distance could result in greater use of aggression and coercion.

A small number of studies have found that citizen resistance also varies across communities (McCarthy, Porter, Townsley, & Alpert, 2019; Reisig, McCluskey, Mastrofski, & Terrill, 2004). There is evidence that trust in police and perceptions of police legitimacy are lower in urban, lower socio-economic, and more racially heterogeneous communities (Gau & Brunson, 2010; Kochel, 2012). For minority communities, perceptions of police legitimacy and distrust are likely to derive in part from historical experiences of mistreatment by police (Pryce & Chenane, 2021). The social distance theory of power predicts that when lower power individuals perceive that the power being wielded over them is illegitimate, they are more likely to react with avoidance or resistance, rather than cooperation (Lammers et al., 2012; Magee & Smith, 2013). Thus, ecological variations in citizen resistance may reflect, at least to some extent, perceptions of the legitimacy of police as power holders, aligning with broader literature on the influence of police legitimacy on citizen cooperation (Tyler & Fagan, 2008).

This theoretical framework suggests that police use of force could be reduced by lessening power differences and/or perceived social distance between police and

communities. More symmetrical relationships between police and communities may be facilitated with approaches such as procedural justice and community-oriented policing (COP), two approaches that elevate the value of citizens in policing and community safety processes (McCarthy et al., 2020). The features of COP may create conditions under which officers can develop a more collective (superordinate) identity with the communities they police, thereby reducing perceptions of social distance, reducing threat perceptions, and increasing empathy towards community members (McCarthy et al., 2020; Stephan & Stephan, 2017). There is also evidence that when higher power individuals view their power as a responsibility and are encouraged to take the perspective of less powerful others, the impacts of power on social distance are restrained (Magee, 2020).

The social distance theory of power intersects with a range of existing theories used to explain police use of force at the individual and community level. However, this theoretical framework enables consideration of identity threat perceptions beyond the lens of race, to a broader lens of power relations, encompassing a range of individual and community characteristics that can influence power and status (Stephan et al., 2008). The application of this theory to understanding the ecological distribution of police use of force may assist in unifying the disparate theoretical approaches and findings in this area and could also aid in identifying appropriate remediating responses.

Commentary #9 by Chief Adam Palmer: Using Use of Force Data and Research to Further Public Confidence in the Police

Public perception is that police use force much more frequently than is the reality (commentary #10). Contrary to this belief, police use force very rarely. In the Vancouver Police Department, for example, physical force of any kind is rare, occurring in less than one per cent of the total calls for police service in Vancouver. This is the case in most Canadian police agencies (Hall & Votova, 2013; Walker & Bennell, 2021). Furthermore, when force is required to be used, it is typically determined by oversight bodies to be justified. As such, misconceptions about police use of force can be improved through research about the actual frequency of police use of force and the rates of improper use of force.

In addition, to further public confidence, systematic approaches to use of force data collection should be adopted and used for the purpose of use of force research (Koper, 2016). Having use of force data systematically recorded promotes public transparency and accountability, as all police agencies are using the same process to record and report use of force incidents. As a result, in times such as these when we are confronted with criticism or questions regarding police use of force, we are able to provide the public with reliable data. While use of force reporting requirements may vary somewhat between police jurisdictions (Walker & Bennell, 2021), a systematic approach has been taken within most jurisdictions in Canada. At the Vancouver Police Department, each use of force incident is required to be documented and reported to our province through a detailed template that tracks the specific type of force used and how these tactics were, or were not, effective (Province of British Columbia, 2020). This systematic reporting enables the province to develop evidence-based regulations and training, including de-escalation training. As an organization, we use this use of force data to tailor our training to the specific situations and trends that are currently being encountered by our officers on the street.

Research can also be furthered by incorporating data from civilian oversight bodies that review use of force complaints. For Vancouver police officers, allegations of improper use of force are subject to two separate civilian investigative bodies (Stelkia, 2020). The first civilian oversight body investigates officers to determine whether their actions were justified according to criminal law. The second civilian oversight body investigates professional misconduct, which uses the much lower civil standard – a balance of probabilities – to determine whether force was unjustified. Even at the lower civil standard, of the approximately 270,000 calls for service that we deal with each year in Vancouver, use of force misconduct is found in an average of only five incidents annually – in one of 54,000 calls for service we deal with. Better dissemination of these results, and of research on civilian oversight decisions more generally, will likely enhance public confidence in the police.

Lastly, research can further public confidence by examining the effectiveness of standardized use of force models and training. In Canada, we established a national use of force model 20 years ago (Hoffman, Lawrence, & Brown, 2004). This model provides consistency across our country for officers, experts, courts, and the public. Because every police agency uses the same model, police use of force is commonly understood and articulated. Likewise, confidence in police use of force can be enhanced by having similar training and standards. These standards are set by our province and apply to firearms and use of force training, qualifications, and regulations (Province of British Columbia, 2020). Having consistency in these areas further assures the public that police are professionally trained and held to a consistently high standard that is independently overseen.

The current discourse on police use of force has made it apparent that research is urgently needed to document the issues described above (e.g., the low frequency with which police actually use force, the small number of police misconduct findings, the standardization of data collection, the use of force model, and training). This research is central to maintaining public confidence in the police and the officers that serve our communities.

Commentary #10 by Craig Bennell, PhD, and Ariane-Jade Khanizadeh, MA: Increasing Public Understanding of Police Use of Force

Research conducted in the United States and Canada suggests that the public does not have a good understanding of police use of force (e.g., Corey & Bennell, 2008; O'Neill, Pirsig, Stark, & Hanson, 2017). In one study that surveyed university students in Canada, participants were found to significantly overestimate the frequency with which force is used by police officers (Khanizadeh, Bennell, McGale, unpublished data); for example, the average estimate for how often firearms are used by the police was roughly 12% of all police–public encounters, whereas the rate of firearm use in Canada is actually thought to be closer to 0.01% (Hall & Votova, 2013). These same students also believed officers receive much more training in the use of force and de-escalation than they actually do, they lacked an appreciation for the dynamics of use of force situations (e.g., action–reaction issues) and the dangers inherent in some police–citizen encounters (e.g., those involving knife-wielding assailants), and they minimized the impact that stress can have on officers with respect to their decision-making, on-scene performance, and post-event memory. In another recent study from the United States, over half of participants with very liberal leaning views estimated that 1,000 or more unarmed Black men were killed by American police officers in 2019, when the actual (still very tragic) number is likely to be

between 60 to100 (McCaffree & Saide, 2021). These very liberal participants also estimated that more than 60% of those killed by the police in 2019 were Black, whereas available data suggests the proportion is closer to 25%.

While we are not aware of any research that definitively demonstrates where these misconceptions come from, it seems likely that media portrayals (particularly social media publicity) of police use of force incidents play a role (Graziano, 2019). Consistent with this, survey respondents in our research who endorsed use of force myths reported that mainstream and social media is often where they get their information about policing. Regardless of where these misunderstandings originate, to the extent that these views are widespread, they may have far-reaching effects. For example, people who think that use of force is common, especially unjustified force, will likely hold negative views of the police (Weitzer, 2002), and this may cause tension between the police and the communities they serve, resulting in a lack of collaboration and cooperation (Tyler, 2005). Such views might also have more specific effects, such as when a particular case of use of force is under scrutiny (e.g., in a trial). In one recent study, discrepancies between a police officer's account of a use of force incident and body-worn camera footage of the event were interpreted by most participants as an intentional attempt on the officer's part to be deceptive (Schultheis, Ellingwood, & Bennell, 2015). Very few considered other plausible explanations, such as the officer's memory being impacted by stress.

If knowledge gaps are pervasive, what can be done to educate the public? Currently, we don't know. Some anecdotal evidence suggests that exposing people to use of force training can improve knowledge about the use of force (e.g., Nicholson, 2018), but it is unclear if such an intervention can be scaled up. Citizen academies are also used in some jurisdictions to educate the public about policing issues, including the use of force, but to date there have been few evaluations of their impact (however, see Perez, Nguyen, & Vogel, 2020). Our own work in this area has shown lengthy interventions (e.g., lectures on the use of force) can enhance knowledge and change attitudes about police use of force in a student sample, but questions remain about whether these results generalize to the wider public, remain stable over time, can be found for shorter interventions, or predict other outcomes, such as increased trust in the police.

Of course, highlighting the issues above is not meant to minimize the seriousness of cases where the police do use force, especially when that force is applied in a biased or excessive manner. Nor is it an attempt to place the sole burden of learning on the public; for example, we agree with Kahn (commentary #7) that police professionals need to become more aware of issues that might impact their use of force, including the potential role of explicit and implicit biases. Our contribution is simply an acknowledgement that, in addition to knowledge gaps among police professionals, public knowledge about the use of force by police appears to be very limited, and this may negatively impact opportunities for informed dialogue between the police and the public. In addition to focusing on what police professionals need to learn, police researchers should determine what the public thinks about the use of force, identify where misunderstandings come from, devise ways to effectively educate the public to correct misconceptions, and carefully evaluate these interventions to examine their short- and long-term effects.

Concluding Thoughts

The goal of this paper was to identify specific issues related to police use of force that leading police scholars and practitioners believe require immediate attention. The topics

highlighted above relate to different, but equally important points along the use of force pathway – from how we train police officers to use force or de-escalation strategies in the field (commentary #1-3), to how we understand use of force encounters and the decisions officers make during these encounters (commentary #4-6), to how the police apply force (sometimes inappropriately) in the communities they serve (commentary #7-8), to how we effectively communicate all these things to the public (commentary #9-10). We hope that others will join us in studying these topics.[4]

Considered together, the contributions also highlight other fundamental issues that need to be tackled if we are to advance the priorities described above. Perhaps most obvious is the importance of evaluation (commentary #1-5, #7, and #10). While not mentioned explicitly in all contributions, it is clear to us all that without conducting rigorous evaluations, little progress can be made; it will be impossible to determine if a new training programme accomplishes its objectives, or a new policy improves police decision-making, or a public education plan enhances knowledge about the use of force. Conducting such evaluations may represent a significant challenge. Indeed, while police agencies are good at identifying problems that need to be solved and developing strategies to solve those problems, they appear to spend far less energy testing those strategies and tracking them over time to determine if they remain effective (e.g., Huey, Blaskovits, Bennell, Kalyal, & Walker, 2017). However, we believe this is a challenge that is well worth taking up.

Another set of priorities that cuts across some of the contributions relate to the measurement and analysis of use of force encounters (commentary #4, #7, and #9). In some jurisdictions, reliable use of force data is still not collected, and variations in how jurisdictions define force, determine units of analysis, and calculate rates of occurrence can make it difficult to make sense of any data that are collected (Garner, Hickman, Malega, & Maxwell, 2018). In some cases, the absence of reliable data makes it impossible to develop even a basic understanding of how often force is applied and against whom, and it makes it challenging to conduct evaluations of policies or programmes designed to influence the use of force. These issues must be resolved. Relatedly, there are challenges associated with the analysis of use of force incidents. For example, current data hinders efforts to understand the complexities of these encounters as an evolving interaction between two or more people (commentary #4-5). Luckily, the rapid adoption of new technology (e.g., body-worn cameras; Willits & Makin, 2018), and the emergence of new analytical tools (e.g., behavioural sequence analysis; Longridge et al., 2020), is making progress in this area possible.

Unfortunately, we were not able to include researchers from all parts of the world in the current paper (e.g., researchers from African and Asian countries are not represented). This was simply due to space limitations and should not be taken to mean that important research from these regions does not exist (e.g., Akinlabi, 2020; Belur, 2009). The priorities described in this paper are also not the only topics that need to be urgently addressed, but we believe they are important issues. Effectively tackling these issues will not only require a collective effort on the part of academic researchers who study police

---

[4] *At the heart of the topics covered in this paper are general issues related to psychophysiology, learning and retention, decision-making, prejudice and discrimination, interpersonal dynamics, and public attitudes and perceptions, among others. Given this, we believe that policing scholars can learn a lot from researchers who examine these issues in non-police settings, and we encourage policing scholars to actively seek out opportunities to collaborate with these researchers. We also hope that this paper encourages researchers who study these broad issues in non-police settings to apply their expertise to some of the policing topics highlighted in these commentaries.*

use of force; they will require a greater focus on academic–police-community partnerships and a better use of practitioner–academics, or 'pracademics', working within police agencies. Working together to resolve these and other issues related to police use of force will likely result in positive outcomes for the police and the communities they serve, including a better understanding of the use of force, enhanced police performance, improved citizen and officer safety, and increased public trust and confidence in the police. Progress in these areas is needed now more than ever.

Conflicts of Interest

All authors declare no conflict of interest.

Author Contributions

Craig Bennell, Ph.D. (Conceptualization; Project administration; Writing – original draft; Writing – review & editing) Geoffrey Alpert (Writing – original draft; Writing – review & editing) Judith P. Andersen (Writing – original draft; Writing – review & editing) Joseph Arpaia (Writing – original draft; Writing – review & editing) Juha-Matti Huhta (Writing – original draft; Writing – review & editing) Kimberly B. Kahn (Writing – original draft; Writing – review & editing) Ariane-Jade Khanizadeh (Project administration; Writing – original draft; Writing – review & editing) Molly McCarthy (Writing – original draft; Writing – review & editing) Kyle McLean (Writing – original draft; Writing – review & editing) Renée J. Mitchell (Writing – original draft; Writing – review & editing) Arne Nieuwenhuys (Writing – original draft; Writing – review & editing) Adam Palmer (Writing – original draft; Writing – review & editing) Michael D. White (Writing – original draft; Writing – review & editing).

References

Adams, K. (1999). What we know about police use of force. In J. Travis, J. M. Chaiken & R. J. Kaminski (Eds.), *Use of force by police: Overview of national and local data* (pp. 1–14). Washington, DC: National Institute of Justice.

Akinlabi, O. M. (2020). Citizens' accounts of police use of force and its implication for trust in the police. *Journal of Crime and Justice*, *43*(2), 145–160. https://doi.org/10.1080/0735648X.2019.1650798

Alcorn, T. (2019). *Who will hold the police accountable?* The Atlantic. https://www.theatlantic.com/politics/archive/2019/07/battle-over-police-accountability/594484/?gclid=Cj0KCQiAwMP9BRCzARIsAPWTJ_F9oItBFrX3le5GsbUlbTNZAQIc8UkkRL2OMz0vdq3veKCyR9Iol5kaAlH7EALw_wcB

Alpert, G. P., & Dunham, R. G. (2010). Policy and training recommendations related to police use of CEDs: Overview of findings from a comprehensive national study. *Police Quarterly*, *13*(3), 235–259. https://doi.org/10.1177/1098611110373993

Andersen, J. P., Di Nota, P., Beston, B., Boychuk, E. C., Gustafsberg, H., Poplawski, S., & Arpaia, J. (2018). Reducing lethal force errors by modulating police physiology. *Journal of Occupational and Environmental Medicine*, *6*(10), 867–874. https://doi.org/10.1097/JOM.0000000000001401

Anderson, G. S., Litzenberger, R., & Plecas, D. (2002). Physical evidence of police officer stress. *Policing: An International Journal of Police Strategies and Management.*, *25*(2), 399–420. https://doi.org/10.1108/13639510210429437

Arble, E., Daugherty, A. M., & Arnetz, B. (2019). Differential effects of physiological arousal following acute stress on police officer performance in a simulated critical incident. *Frontiers in Psychology*, *9*, 1–11. https://doi.org/10.3389/fpsyg.2019.00759

Baldwin, S., Bennell, C., Andersen, J. P., Semple, T., & Jenkins, B. (2019). Stress-activity mapping: physiological responses during general duty police encounters. *Frontiers in Psychology*, *10*, 1–17. https://doi.org/10.3389/fpsyg.2019.02216

Barrera, J. (2020). *AFN national chief calls for suspension of RCMP officer who tackled Chief Allan Adam*. CBC News. https://www.cbc.ca/news/indigenous/afn-bellegarde-rcmp-allan-adam-1.5627715.

Belur, J. (2009). Police use of deadly force: Police perceptions of a culture of approval. *Journal of Contemporary Criminal Justice*, *25*(2), 237–252. https://doi.org/10.1177/1043986209333594

Bernstein, N. A. (1996). On dexterity and its development. In M. L. Latash & M. T. Turvey (Eds.), *Dexterity and its development* (pp. 3–244). Mahwah, NJ: Lawrence Erlbaum Associates.

Bertilsson, J., Niehorster, D. C., Fredriksson, P. J., Dahl, M., Granér, S., Fredriksson, O., . . . Nyström, M. (2019). Towards systematic and objective evaluation of police officer performance in stressful situations. *Police Practice and Research*, *21*(6), 1–15. https://doi.org/10.1080/15614263.2019.1666006

Black, D. J. (1976). *The behavior of law*. New York, NY: Academic Press.

Brumback, K., & Rico, R. J. (2020). *Calls for de-escalation training grow after Atlanta Shooting*. AP News. https://apnews.com/0e3104d94c9d497c0b2a97616e39d103

Bureau of Justice Statistics. (2020). *Local police departments: Policies and procedures, 2016*. US Department of Justice. https://www.bjs.gov/content/pub/pdf/lpdpp16.pdf

Burke, R. J. (Ed) (2017). *Stress in policing. Sources, consequences and interventions*. New York, NY: Routledge.

Corey, S., & Bennell, C. (2008). Investigating beliefs related to use-of-force encounters among police officers and jury-eligible members of the public [Conference session]. Annual Meeting of the Society for Police and Criminal Psychology, Walnut Creek, CA, USA.

Davis, K. C. (1969). *Discretionary justice: A preliminary inquiry*. Baton Rouge, LA: Louisiana State University Press.

Di Nota, P. M., & Huhta, J. M. (2019). Complex motor learning and police training: Applied, cognitive, and clinical perspectives. *Frontiers in Psychology*, *10*, 1–20. https://doi.org/10.3389/fpsyg.2019.01797

Ducrocq, E., Wilson, M., Smith, T. J., & Derakhshan, N. (2017). Adaptive working memory training reduces the negative impact of anxiety on competitive motor performance. *Journal of Sport and Exercise Psychology*, *39*(6), 412–422. https://doi.org/10.1123/jsep.2017-0217

Engel, R. S., Corsaro, N., Isaza, G. I., & McManus, H. D. (2020b). Examining the impact of Integrating Communications, Assessment, and Tactics (ICAT) de-escalation training for the Louisville Metro Police Department: Initial Findings. University of Cincinnati, Center for Police Research and Policy.

Engel, R. S., McManus, H. D., & Herold, T. D. (2020a). Does de-escalation training work? A systematic review and call for evidence in police use of force reform. *Criminology & Public Policy*, *19*(3), 721–759. https://doi.org/10.1111/1745-9133.12467

Fazio, R. H., & Olson, M. A. (2003). Implicit measures in social cognition research: Their meaning and use. *Annual Review of Psychology*, *54*(1), 297–327. https://doi.org/10.1146/annurev.psych.54.101601.145225

Foulk, T. A., Lanaj, K., Tu, M.-H., Erez, A., & Archambeau, L. (2018). Heavy is the head that wears the crown: An actor-centric approach to daily psychological power, abusive leader behaviour, and perceived incivility. *Academy of Management Journal*, *61*(2), 661–684. https://doi.org/10.5465/amj.2015.1061

Fridman, J., Barrett, L. F., Wormwood, J. B., & Quigley, K. S. (2019). Applying the theory of constructed emotion to police decision making. *Frontiers in Psychology*, *11*, 1–12. https://doi.org/10.3389/fpsyg.2019.01946

Garner, J. H., Hickman, M. J., Malega, R. W., & Maxwell, C. D. (2018). Progress toward national estimates of police use of force. *PLoS One*, *13*(2), e0192932. https://doi.org/10.1371/journal.pone.0192932

Gau, J. M., & Brunson, R. K. (2009). Procedural justice and order maintenance policing: A study of inner-city young men's perceptions of police legitimacy. *Justice Quarterly*, *27*(2), 255–279. https://doi.org/10.1080/07418820902763889

Goff, P. A., & Kahn, K. B. (2012). Racial bias in policing: Why we know less than we should. *Social Issues and Policy Review*, *6*(1), 177–210. https://doi.org/10.1111/j.1751-2409.2011.01039.x

Goff, P. A., Lloyd, T., Geller, A., Raphael, S., & Glaser, J. (2016). *The science of justice: race, arrests, and police use of force*. Center for Policing Equity. https://policingequity.org/what-we-do/research/the-science-of-justice-race-arrests-and-police-use-of-force

Goldsmith, A. J. (2010). Policing's new visibility. *The British Journal of Criminology*, *50*(5), 914–934. https://doi.org/10.1093/bjc/azq033

Gordon, K. (2020). *Doomadgee leaders call for police cooperation after 65 yr man's arrest*. ABC News (Australian Broadcasting Corporation). https://www.abc.net.au/news/2020-11-13/doomadgee-arrest-sparks-outrage-in-indigenous-community/12881850.

Graham v. Connor, 490 U.S. 386 (1989). https://supreme.justia.com/cases/federal/us/490/386/

Graziano, L. M. (2019). News media and perceptions of police: A state-of-the-art-review. *Policing: An International Journal*, *42*(2), 209–225. https://doi.org/10.1108/PIJPSM-11-2017-0134

Hall, C. A., & Votova, K. (2013). *Prospective analysis of police use of force in four Canadian cities: Nature of events and their outcomes*. Defense Research and Development Canada. https://publications.gc.ca/collections/collection_2016/rddc-drdc/D68-3-011-2013-eng.pdf

Hilton, J. L., & Von Hippel, W. (1996). Stereotypes. *Annual Review of Psychology*, *47*, 237–271. https://doi.org/10.1146/annurev.psych.47.1.237

Hoffman, R., Lawrence, C., & Brown, G. (2004). Canada's national use of force framework for police officers. *Police Chief*, *71*(10), 125–126.

Huey, L., Blaskovits, B., Bennell, C., Kalyal, H. J., & Walker, T. (2017). To what extent do Canadian police professionals believe that their agencies are 'Targeting, Testing, and Tracking' new policing strategies and programs? *Police Practice and Research*, *18*(6), 544–555. https://doi.org/10.1080/15614263.2017.1363968

Kahn, K. B., & Martin, K. M. (2020). The social psychology of racially biased policing: Evidence-based policy responses. *Policy Insights from Behavioral and Brain Sciences*, *7*(2), 107–114. https://doi.org/10.1177/2372732220943639

Kahn, K. B., Steele, J., McMahon, J. M., & Stewart, G. (2017). How suspect race affects police use of force in an interaction over time. *Law and Human Behavior*, *41*(2), 117–126. https://doi.org/10.1037/lhb0000218

Klinger, D. A. (2001). *Police responses to officer-involved shootings (192286)*. National Institute of Justice. https://www.ncjrs.gov/pdffiles1/nij/grants/192286.pdf

Klockars, C. B. (1985). *The idea of police: Law and criminal justice series*, Vol. *3*. Beverly Hills, CA: SAGE Publications Inc.

Kochel, T. R. (2012). Can police legitimacy promote collective efficacy? *Justice Quarterly*, *29*(3), 384–419. https://doi.org/10.1080/07418825.2011.561805

Koper, C. S. (2016). Advancing research and accountability on police use of deadly force. *Criminology and Public Policy*, *15*(1), 187–192. https://doi.org/10.1111/1745-9133.12192

Lai, C. K., Skinner, A. L., Cooley, E., Murrar, S., Brauer, M., Devos, T., . . . Nosek, B. A. (2016). Reducing implicit racial preferences: II. Intervention effectiveness across time. *Journal of Experimental Psychology: General*, *145*(8), 1001–1016. https://doi.org/10.1037/xge0000179

Lammers, J., Galinksy, A. D., Gordijn, E. H., & Otten, S. (2012). Power increases social distance. *Social Psychological and Personality Science*, *3*(3), 282–290. https://doi.org/10.1177/1948550611418679

Landman, A., Nieuwenhuys, A., & Oudejans, R. R. D. (2016). The impact of personality traits and professional experience on police officers' shooting performance under pressure. *Ergonomics*, *59*(7), 950–961. https://doi.org/10.1080/00140139.2015.1107625

Lee, H., Vaughn, M. S., & Lim, H. (2014). The impact of neighborhood crime levels on police use of force: An examination at micro and meso levels. *Journal of Criminal Justice*, *42*(6), 491–499. https://doi.org/10.1016/j.jcrimjus.2014.09.003

Leen, J., & Horwitz, S. (1998). *Armed and unready: City pays for failure to train officers with sophisticated weapon*. Washington Post. https://www.washingtonpost.com/archive/politics/1998/11/18/armed-and-unready/419a50bf-23b0-4175-93ee-33211044c8df/

Lewinski, W. (2019). *The effectiveness of academy training: A three country study*. Force Science Institute. https://www.forcescience.org/2019/02/the-effectiveness-of-academy-training-a-three-country-study/

Longridge, R., Chapman, B., Bennell, C., Clarke, D. D., & Keatley, D. (2020). Behaviour sequence analysis of police body-worn camera footage. *Journal of Police and Criminal Psychology*. https://doi.org/10.1007/s11896-020-09393-z. [Epub ahead of print].

Low, W. R., Sandercock, G. R. H., Freeman, P., Winter, M. E., Butt, J., & Maynard, I. (2020). Pressure training for performance domains: A meta-analysis. *Sport, Exercise, and Performance Psychology*, *10*(1), 149–163. https://doi.org/10.1037/spy0000202

Magee, J. C. (2020). Power and social distance. *Current Opinion in Psychology*, *33*, 33–37. https://doi.org/10.1016/j.copsyc.2019.06.005

Magee, J. C., & Smith, P. K. (2013). The social distance theory of power. *Personality and Social Psychology Review*, *17*(2), 158–186. https://doi.org/10.1177/1088868312472732

Masters, R. S. W. (1992). Knowledge, knerves and know-how: The role of explicit versus implicit knowledge in the breakdown of a complex motor skill under pressure. *British Journal of Psychology*, *83*(3), 343–358. https://doi.org/10.1111/j.2044-8295.1992.tb02446.x

Masters, R., & Maxwell, J. (2008). The theory of reinvestment. *International Review of Sport and Exercise Psychology*, *1*(2), 160–183. https://doi.org/10.1080/17509840802287218

McCaffree, K., & Saide, A. (2021). *How informed are Americans about race and policing?*. Skeptic Research Center. https://www.skeptic.com/research-center/reports/Research-Report-CUPES-007.pdf

McCarthy, M., Porter, L., Townsley, M., & Alpert, G. (2018). Influence of community characteristics on serious police use of force events in an Australian policing jurisdiction: A test of minority threat, social disorganisation, and ecological contamination theories. *Policing and Society*, *29*(9), 1091–1108. https://doi.org/10.1080/10439463.2018.1493109

McCarthy, M., Porter, L., Townsley, M., & Alpert, G. (2019). A typology of citizen presentations in police use of force events: Are there ecological drivers? *Police Quarterly*, *22*(3), 360–387. https://doi.org/10.1177/1098611119835535

McCarthy, M., Porter, L., Townsley, M., & Alpert, G. (2020). The role of social distance in the relationship between police-community engagement and police coercion. *Policing & Society*, 1–20 https://doi.org/10.1080/10439463.2020.1749274

McEwen, T. (1997). Policies on less-than-lethal force in law enforcement agencies. *Policing: an International Journal of Police Strategies & Management*, *20*(1), 39–59. https://doi.org/10.1108/13639519710162006

McKesson, D., Sinyangwe, S., Elzie, J., & Packnett, B. (2016). *Police use of force policy analysis*. Campaign Zero. https://www.joincampaignzero.org/force

McLean, K., Wolfe, S. E., Rojek, J., Alpert, G. P., & Smith, M. R. (2020). A randomized controlled trial of social interaction police training. *Criminology & Public Policy*, *19*(3), 805–832. https://doi.org/10.1111/1745-9133.12506

Nicholson, K. (2018). *Police use of force: Knowing when to pull the trigger is harder than it looks*. CBC. https://www.cbc.ca/news/canada/manitoba/reporters-notebook-deadly-force-1.4619001

Nieuwenhuys, A., & Oudejans, R. R. D. (2012). Anxiety and perceptual-motor performance: toward an integrated model of concepts, mechanisms, and processes. *Psychological Research Psychologische Forschung*, *76*(6), 747–759. https://doi.org/10.1007/s00426-011-0384-x

Nieuwenhuys, A., & Oudejans, R. R. D. (2017). Anxiety and performance: Perceptual-motor behavior in high-pressure contexts. *Current Opinion in Psychology*, *16*, 28–33. https://doi.org/10.1016/j.copsyc.2017.03.019

Nix, J., Campbell, B. A., Byers, E. H., & Alpert, G. P. (2017). A bird's eye view of civilians killed by police in 2015: Further evidence of implicit bias. *Criminology & Public Policy*, *16*(1), 309–340. https://doi.org/10.1111/1745-9133.12269

Nowicki, E. (2001). Use of force options. *Law and Order*, *49*(2), 35–37.

O'Neill, D. A., Pirsig, S., Stark, E., & Hanson, K. (2017). Realities vs. perceptions of police use-of force dynamics [Conference session]. Annual Meeting of the Society for Police and Criminal Psychology, San Diego, CA, USA.

Lancaster Online (2020). We must find a better way: City officials react to man fatally shot by officer in Lancaster city. Lancaster Online. https://lancasteronline.com/news/local/we-must-find-a-be tter-way-city-officials-react-to-man-fatally-shot-by-officer/article_7a72c030-f63a-11ea-b995-67207a3447ba.html

Oudejans, R. R. D., & Nieuwenhuys, A. (2009). Perceiving and moving in sports and other high-pressure contexts. *Progress in Brain Research*, *174*, 35–48. https://doi.org/10.1016/S0079-6123(09)01304-1

Pate, A. M., & Fridell, L. A. (1995). Toward the uniform reporting of police use of force: Results of a national survey. *Criminal Justice Review*, *20*(2), 123–145. https://doi.org/10.1177/073401689502000203

Perez, N. M., Nguyen, T., & Vogel, B. (2020). Community police academies: Assessing the effect of education on public perceptions of police. *The Police Journal*. https://doi.org/10.1177/0032258X20926939. [Epub ahead of print].

Pinder, R. A., Davids, K., Renshaw, I., & Araújo, D. (2011). Representative learning design for research and practice in sport. *Journal of Sport and Exercise Psychology*, *33*(1), 146–155. https://doi.org/10.1123/jsep.33.1.146

New Zealand Police. (n.d.). *TENR – Operational threat assessment*. New Zealand Police. https://fyi.org.nz/request/9725/response/35815/attach/5/TENR.pdf

Prenzler, T., Porter, L., & Alpert, G. P. (2013). Reducing police use of force: Case studies and prospects. *Aggression and Violent Behavior*, *18*(2), 343–356. https://doi.org/10.1016/j.avb.2012.12.004

President's Task Force on 21st Century Policing (2015). *Final Report of the President's Task Force on 21st Century Policing*. Office of Community Oriented Policing Services. https://cops.usdoj.gov/pdf/taskforce/taskforce_finalreport.pdf

Province of British Columbia (2020). *Provincial policing standards*. Province of British Columbia. https://www2.gov.bc.ca/assets/gov/law-crime-and-justice/criminal-justice/police/standards/provincial-policing-standards.pdf

Pryce, D. K., & Chenane, J. L. (2021). Trust and confidence in police officers and the institution of policing: The views of African Americans in the American south. *Crime & Delinquency*, https://doi.org/10.1177/0011128721991823. [Epub ahead of print].

Reisig, M. D., McCluskey, J. D., Mastrofski, S. D., & Terrill, W. (2004). Suspect disrespect toward the police. *Justice Quarterly*, *21*(2), 241–268. https://doi.org/10.1080/07418820400095801

Röttger, S., Theobald, D. A., Abendroth, J., & Jacobsen, T. (2020). The effectiveness of combat tactical breathing as compared with prolonged exhalation. *Applied Psychophysiology and Biofeedback*, *46*, 19–28. https://doi.org/10.1007/s10484-020-09485-w

Russonello, G. (2020). *Have Americans warmed to calls to 'Defund the police'?*. The New York Times. https://www.nytimes.com/2020/07/03/us/politics/polling-defund-the-police.html

Sanchez, R. (2020). *Police reforms quickly take hold across America. It's only just getting started*. CNN. https://www.cnn.com/2020/06/14/us/george-floyd-national-police-reforms/index.html

Schultheis, E., Ellingwood, H., & Bennell, C. (2015). *Is seeing believing? Public perception in the use of body-worn video by police [Conference session]*. Annual meeting of the Society for Police and Criminal Psychology, Atlanta, GA, USA.

Shjarback, J. A., White, M. D., & Bishopp, S. A. (2021). Can police shootings be reduced by requiring officers to report when they point firearms at citizens? *Injury Prevention*. https://doi.org/10.1136/injuryprev-2020-043932

Smith, B. W., & Holmes, M. D. (2014). Police use of excessive force in minority communities: A test of the minority threat, place, and community accountability hypotheses. *Social Problems*, *61*(1), 83–104. https://doi.org/10.1525/sp.2013.12056

Spangler, D. P., Gamble, K. R., McGinley, J. J., Thayer, J. F., & Brooks, J. R. (2018). Intra-individual variability in vagal control is associated with response inhibition under stress. *Frontiers in Human Neuroscience*, *12*, 1–9. https://doi.org/10.3389/fnhum.2018.00475

Stelkia, K. (2020). An exploratory study on police oversight in British Columbia: The dynamics of accountability for Royal Canadian Mounted Police and municipal police. *Sage Open*, *10*(1). https://doi.org/10.1177/2158244019899088

Stephan, W. G., Renfro, C. L., & Davis, M. D. (2008). The role of threat in intergroup relations. In: U. Wagner, L. R. Tropp, G. Finchilescu, & C. Tredoux (Eds.), *Social issues and interventions. Improving intergroup relations: Building on the legacy of Thomas F. Pettigrew* (pp. 55–72). Oxford, UK: Blackwell Publishing.

Stephan, W. G., & Stephan, C. W. (2017). Intergroup threat theory. In Y. Y. Kim (Ed.), *The international encyclopedia of intercultural communication* (pp. 1–12). New York, NY: John Wiley and Sons.

Stewart, J. K. (2009). *Independent board of inquiry into the Oakland Police Department March 21, 2009 incident: A public report of findings and recommendations*. Center for Naval Analysis, Center for Public Research. http://www2.oaklandnet.com/oakca1/groups/police/documents/webcontent/dowd005731.pdf

Stoughton, S. W., Noble, J. J., & Alpert, G. P. (2020). *Evaluating police uses of force*. New York, NY: NYU Press.

Terrill, W., & Paoline, III, E. A. (2013). Examining less lethal force policy and the force continuum: Results from a national use of force study. *Police Quarterly*, *16*(1), 38–65. https://doi.org/10.1177/1098611112451262

Terrill, W., & Reisig, M. D. (2003). Neighborhood context and police use of force. *Journal of Research in Crime and Delinquency*, *40*(3), 291–321. https://doi.org/10.1177/0022427803253800

Todak, N., & White, M. D. (2019). Expert officer perceptions of de-escalation in policing. *Policing: An. International Journal*, *42*(5), 832–846. https://doi.org/10.1108/PIJPSM-12-2018-0185

Tyler, T. R. (2005). Policing in black and white: Ethnic group differences in trust and confidence in the police. *Police Quarterly*, *8*(3), 322–342. https://doi.org/10.1177/1098611104271105

Tyler, T. R., & Fagan, J. (2008). Legitimacy and cooperation: Why do people help the police fight crime in their communities. *Ohio State Journal of Criminal Law*, *6*, 231–275. https://doi.org/10.2139/ssrn.887737

Tyler, T. R., & Huo, Y. J. (2002). *Trust in the law: Encouraging public cooperation with the police and courts*. New York, NY: Russell Sage Foundation.

Van Peer, J. M., Gladwin, T. E., & Nieuwenhuys, A. (2019). Effects of threat and sleep deprivation on action tendencies and response inhibition. *Emotion*, *19*(8), 1425–1436. https://doi.org/10.1037/emo0000533

Vlemincx, E., Abelson, J. L., Lehrer, P. M., Davenport, P. W., Van Diest, I., & Van den Bergh, O. (2013). Respiratory variability and sighing: a psychophysiological reset model. *Biological Psychology*, *93*(1), 24–32. https://doi.org/10.1016/j.biopsycho.2012.12.001

Waldrop, M. M. (1993). *Complexity: The emerging science at the edge of order and chaos*. New York, NY: Simon and Schuster.

Walker, T., & Bennell, C. (2021). *Use of force by Canadian police officers*. Canadian Police Chief. https://www.cpcmagazine-digital.com/ccpt/0121_winter_2021/MobilePagedArticle.action?articleId=1660235#articleId1660235

Weitzer, R. (2002). Incidents of police misconduct and public opinion. *Journal of Criminal Justice*, *30*(5), 397–408. https://doi.org/10.1016/S0047-2352(02)00150-2

White, M. D. (2001). Controlling police decisions to use deadly force. Reexamining the importance of administrative policy. *Crime & Delinquency*, *47*(1), 131–151. https://doi.org/10.1177/0011128701047001006

White, M. D., Mora, V., & Orosco, C. (2019). Exploring variation in police perceptions of de-escalation: Do officer characteristics matter? *Policing: A Journal of Policy and Practice*. https://doi.org/10.1093/police/paz062. [Epub ahead of print].

Willits, D. W., & Makin, D. A. (2018). Show me what happened: Analyzing use of force through analysis of body-worn camera footage. *Journal of Research in Crime and Delinquency*, *55*(1), 51–77. https://doi.org/10.1177/0022427817701257