



## Evaluating the Effects of Stress and Fatigue on Police Officer Response and Recall: A Challenge for Research, Training, Practice and Policy<sup>☆</sup>



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Armed police officers frequently respond to evolving, dynamic, and potentially dangerous incidents. Given the challenging and often controversial nature of this response context, understanding the impact of officer stress and fatigue on performance in incidents involving use of force is important for trainers, investigators, legal professionals, and policy-makers. The psychological literature on human performance is broadly informative with respect to the potential effects of stress and fatigue on response performance (e.g., shooting accuracy) and the reliability of accounts provided by officers. Unsurprisingly, stress and fatigue typically impair performance, although further research is needed to (i) delineate the precise nature of the effects of stress and fatigue on response performance and memory, and (ii) explore relevant contextual and boundary conditions. This article considers what current research can contribute to training and practice in use of force contexts, and outlines key methodological challenges for researchers and consumers of research in this field.

*Keywords:* Memory, Stress, Police, Law enforcement, Eyewitness, Fatigue

Police officers frequently respond to evolving, dynamic, and potentially dangerous incidents. Unlike bystanders, these “operational witnesses” are variously required to act to preserve life, protect members of the public, and neutralise violence. Ultimately, an officer’s role is to take effective and efficient action to intervene, de-escalate, and resolve such incidents. An officer’s response in such circumstances depends not only on their operational mandate but also on a variety of contextual factors at the level of the individual (e.g., level of stress or anxiety, perceived risk, previous experience, fatigue, training), and at the level of the incident (e.g., presence of weapons, number of perpetrators, location, availability of back-up). Following an incident, officers are typically required to describe and justify their response and, like any witness, provide information about their own and others’ actions. The manner in which such accounts are elicited, and the scrutiny under which legal professionals, the public, media, and professional standards agencies place them, varies significantly across jurisdictions.

This article explores the effects of two contextual or “estimator” factors on officer performance in operational-response

contexts involving use of force. Given the challenging and often controversial nature of this response context, understanding the potential impact of officer stress and fatigue on performance in incidents involving use of force is important for trainers, investigators, legal professionals, and policy-makers. The psychological literature on human performance can provide insights about two important aspects of this context: first, the nature of the response, and second, the reliability of accounts provided by officers.

Focusing on stress and fatigue, this article briefly examines (i) the extent to which psychological research in these domains is ready to inform practice, training, and policy; and (ii) methodological challenges facing researchers attempting to inform practice and policy in this domain.

### Effects of Stress and Fatigue on Operational Response

Armed police officers responding in unpredictable, dangerous, high-risk environments produce physiological responses that are consistent with elevated stress levels (Armstrong, Clare,

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& Plecas, 2014; Meyerhoff et al., 2004). Performing well under stressful, high-pressured circumstances is challenging, and decrements in performance in such settings are well documented across the wider applied literature (e.g., Hancock & Szalma, 2008). Broadly, stress or negative arousal is thought to increase cognitive load and impair cognitive and perceptual-motor performance on capacity-demanding tasks. This impairment also occurs in police use-of-force contexts. Despite the fact that officers achieve shooting accuracy rates of over 90% in static shooting tests, the average shooting accuracy for real-life incidents is between 15 and 50% (e.g., Morrison & Vila, 1998). Research using police samples and realistic shooting exercises involving an element of threat has documented negative effects of anxiety on police shooting performance including a reduction in goal-directed attention, increased speed of shooting an approaching suspect, and reduced shooting accuracy (e.g., Nieuwenhuys, Canal-Bruland, & Oudejans, 2012; Nieuwenhuys & Oudejans, 2010; Nieuwenhuys, Savelsbergh, & Oudejans, 2012; for overview see Nieuwenhuys & Oudejans, 2012).

Fatigue as a result of either a short-term stressor (e.g., chasing a fleeing suspect on foot) or a longer-term behaviour pattern (e.g., shiftwork) can also impair performance. Exercise-induced fatigue following dynamic action (i.e., heavy exertion) negatively affects shooting accuracy (Vickers & Williams, 2007) and alters behavioural choices in a shooting context (e.g., decisions to stop running earlier and shoot from a greater distance to the target; Nibbeling, Oudejans, Canal Bruland, van der Wurff, & Daanen, 2013; Nibbeling, Oudejans, Ubink, & Daanen, 2014). In a similar vein, fatigue as a result of sleep disruption has been shown to impair professional performance across a range of time-critical, high pressured, decision-making occupations in aviation (Caldwell, 2012), healthcare (Lockley et al., 2004) and military (Miller, Matsangas, & Shattuck, 2007) settings. In policing contexts, where extended shifts and shiftwork are normal features of the work routine, it is unsurprising that surveys of police officers indicate that sub-optimal sleep is associated with increased self-reported error and safety violations (Rajaratnam et al., 2011; Vila, Kenney, Morrison, & Reuland, 2000).

That stress and fatigue might negatively affect officer performance in a response context is not a controversial assertion given observations in the wider applied human performance literature. Less well understood, however, are (i) the specific nature of performance decrements (e.g., likelihood of differential effects on shooting accuracy versus effects on decision-making accuracy), and (ii) the psychological factors underpinning impaired performance across different operational contexts. Further research is also needed to disentangle the combined effects of stress and fatigue on police use-of-force performance.

It is also worth bearing in mind that, to date, there is little evidence that officers are less susceptible to the effects of stress than other citizens. Recent research suggests that interventions to reduce officer stress response as part of a resilience training programme may be effective (see Andersen et al., 2015; McCraty & Atkinson, 2012) but further work is necessary to empirically establish the efficacy of such interventions.

### Effects of Stress and Fatigue on the Reliability of the Accounts Provided by Officers

Officer accounts about use of force incidents can form a crucial part of subsequent investigations and court proceedings. However, scepticism over these accounts is well documented and generally highlights concerns relating to the potential for police collusion or corruption (Heaton-Armstrong & Wolchover, 2009). Although the deliberate fabrication of evidence is beyond the scope of the current article, there are less controversial explanations for at least some inaccuracies in the “honestly held” accounts provided by officers. The deleterious effect of acute stressors on memory is well-established in animal and human laboratory research (e.g., De Quervain, Roozendaal, Nitsch, McGaugh, & Hock, 2000; Kuhlmann, Piel, & Wolf, 2005; Salehi, Cordero, & Sandi, 2010) and also in research conducted in police and military training environments (e.g., Morgan et al., 2004; Taverniers, Taylor, & Smeets, 2013). In applied research contexts, individuals exposed to stressors typically report significantly fewer details than those in control conditions (e.g., Hulse & Memon, 2006; Stanny & Johnson, 2000) and can show increased susceptibility to misinformation and error (e.g., Hope et al., 2016; Morgan, Southwick, Steffian, Hazlett, & Loftus, 2013).

The complex factors underpinning memory impairment as a result of stress and arousal can be difficult to delineate in applied contexts. Generally, emotionally arousing events are remembered better than neutral events (e.g., Payne et al., 2006) with neurobiological research suggesting that stress hormones can enhance memory consolidation (McGaugh, 2000, 2013; Roozendaal, 2000). Although arousal may activate the amygdala working to enhance memory (Adolphs, Tranel, & Buchanan, 2005; Phelps, 2006), higher levels of stress disrupt hippocampus function and impair memory performance (Shackman et al., 2006; see also Davis & Loftus, 2009). Therefore, in applied contexts, impaired memory likely reflects the level of stress and task complexity (Deffenbacher, Bornstein, Penrod, & McGorty, 2004; Diamond, Campbell, Park, Halonen, & Zoladz, 2007; Lupien, Maheu, Tu, Fiocco, & Schramek, 2007; for review see Finsterwald & Alberini, 2014).

High levels of stress might account for the memory impairments reflected in incomplete witness accounts, irrespective of whether that witness is a bystander or a police officer. However, an active response role in a use-of-force incident may exacerbate these effects. To date, only one study has attempted to directly examine the effects of officer response role on memory for an incident. In Hope et al. (2016), officers were assigned an active witness role (requiring them to respond as they would while on duty) or an observer role during a live scenario involving an armed perpetrator. Active responders, who experienced higher heart rates during the scenario than the observers, provided significantly fewer correct details in their accounts and reported significantly more errors pertaining to weapons (although overall accuracy rates were not compromised).

A similar pattern of recall impairments has been associated with exercise-induced fatigue. Although the wider literature suggests low-to-moderate exertion might improve cognitive

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