Universal Police Behaviours during Critical Incidents and Their Connection to Personality: A Preliminary Study

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Abstract
There is currently no universal standard for training or evaluating operational police performance during critical incident simulations. Accordingly, performance is typically judged on final outcomes (i.e., shoot/no-shoot decision-making) rather than a more detailed set of essential policing skills in both research and practical settings. The current study identifies six behavioural dimensions developed by expert use of force instructors: control of the environment, operational flexibility, initiative, critical decision-making, withdrawal, and target-oriented behaviour. To explore the possible relationship between inherent personality characteristics and primitive (i.e., untrained) police performance, 45 police recruits were assessed during stressful fieldwork simulations. Preliminary findings suggest several possible relationships; scores for control of the environment and operational flexibility were lower in more extraverted and flexible types. Initiative was also lower in more flexible types, and critical decision-making errors were related to higher extraversion. Withdrawal behaviour was greater among more emotional types, and target-oriented behaviour was higher in more extraverted participants. The behavioural dimensions developed in this study can be practically applied to standardize, tailor, and improve current training practices for essential policing skills. Understanding their possible connection to universal personality traits can identify inherent strengths and vulnerabilities that may need more attention and deliberate practice.

1. Introduction

Police officers have an important role in society in maintaining safety and well-being (Laguna et al., 2013). Every situation encountered by an officer has the potential to evolve rapidly, occurs in a complex and dynamic environment, and can involve a great deal of uncertainty (Saus et al., 2006). In extreme cases, officers have to react very quickly and decide what (if any) use of force is appropriate up to and including lethal force. While these encounters are rare, it is the central goal of use of force training to adequately prepare individual officers to successfully resolve these encounters when they do occur. Therefore, the development of effective training and evaluation are important priorities for police practice and research. The current study aims to establish universal definitions of and standards for operational police behaviour during critical incident scenarios, including decision-making and situational awareness. As a preliminary investigation, the current study will also examine the relationship between these behavioural dimensions and personality traits.

1.1 Defining Police Performance

What components does a police patrol's or an individual police officer's performance on a single assignment consist of? How are an assignment's successful components distinguished from unsuccessful components or those needing improvement? The diverse nature of police work involves a multitude of skills and makes quantification and operationalization of 'performance' broadly defined very difficult (Henson et al., 2010). Accordingly, there are no currently established definitions or standards of practice for training or evaluating the essential skills required during critical incidents. However, there has been recent recognition by police researchers that performance should be defined more specifically than final outcomes (Bertilsson et al., 2019; Di Nota & Huhta, 2019). These elements of performance include situational awareness and decision-making that precede the tactical use of force.

A lack of common concepts also makes the systematic evaluation and analysis of an individual police officer's behaviour more difficult in practice. For the purpose of teaching and learning, if we cannot reliably identify recurring behavioural elements from one assignment to another, evaluating or improving them is not possible either. According to the empirical learning model, abstract conceptualization of one's actions is strengthened and tested through concrete experiences (Kolb, 1984), such as training scenarios. Reflecting on

one's experiences through constructive feedback and discussion with instructors is crucial for effective learning. Therefore, a lack of commonly approved behavioural dimensions for operational skills makes this practice more difficult.

Situational awareness (SA) (also referred to in the literature as 'situation awareness') is perhaps the most important skill for police and other first responders to possess and has been widely investigated in several sectors at the individual, team, and system level (for review, see Stanton et al., 2017). Yet, in the context of operational police training SA remains poorly conceptualized and operationalized. Endsley (1995, 1999) defines SA as closely linked to performance and decision-making, and involves three linear components: perception, comprehension, and projection. Perception refers to visual and other sensory information gathered from the surroundings, comprehension means understanding this information within the context of the current situation, and projection refers to anticipating potential events before they unfold. Endsley (1995) pointed out that SA and performance outcomes do not always go hand in hand, such that superior performance can result even if SA is lacking, and that high levels of SA do not guarantee optimal performance. Understanding the interaction of personality with SA has largely been ignored in police training thus far but could provide an explanation and context for errors in performance especially when perceptions, comprehension, and projection are correct.

We argue that, in reality, there are several recurrent elements within police assignments and performances that meet the broad definition of SA, and which need to be individually operationalized. SA isn't something we can just measure or evaluate on a scale from 0 to 10, or in a binary "yes/no" manner. Instead, SA must be practically operationalized into smaller conceptual elements or "chunks" that are distinguishable, and which can facilitate teaching and learning (Di Nota & Huhta, 2019; Di Nota et al., 2020). In the current study, we have operationalized SA into six distinct behavioural dimensions that together inform police behaviour: control of the environment, operational flexibility, initiative, critical decision-making, withdrawal, and target-oriented behaviour (see Section 2.2.2 for more detailed definitions and evaluation criteria). These dimensions allow for evaluation of multiple aspects of dynamic police performance, so that constructive feedback of specific behaviours exhibited during the unfolding encounter can be given, and not just based on the final outcome.

Decision-making can be challenging to define, as it can be both slow, deliberate, and conscious and fast, intuitive, and unconscious (see Kahnemann, 2003). A review of the theoretical definitions of decision-making is not the focus of the present study, but "critical decision-making" is one of the behavioural dimensions evaluated as defined in Section 2.2.2 and conceptualized here. In psychology, decision-making is described as a cognitive process that requires not only identifying available alternatives for action but also understanding their potential consequences (for review see Gallivan et al., 2018). Wrong decisions may be due to misinterpretation or ignorance of the factors affecting a situation, or insufficient understanding of the consequences. Under stressful conditions, decision-making has been shown to rely more heavily on emotional processing areas of the brain (Roos et al., 2017; Thayer et al., 2009), which can lead to more irrational behaviour (Kahnemann, 2003; Riabacke & Riabacke, 2015) and a greater reliance on implicit, untrained skills. Therefore, it is important to understand the relationships between implicit behaviours, skills, emotions, and personality traits in critical police situations.

In extreme cases, police are required to make difficult decisions (e.g., use of lethal force) very quickly and in highly uncertain conditions. Objective physiological evidence shows significant elevations in heart rate and stress hormone concentrations among police officers in training (Andersen et al., 2016; 2018; Nieuwenhuys & Oudejans, 2011), active duty set-

tings (Anderson et al., 2002; Baldwin et al., 2019), and at rest (Planche et al., 2019). High threat training scenarios that allow officers to safely practice their SA and decision-making skills have consistently shown improvement in performance outcomes (i.e., shoot/no-shoot decision-making) (Andersen & Gustafsberg, 2016; Andersen et al., 2018; Nieuwenhuys & Oudejans, 2011). Despite the evidence, there is often a reluctance within police culture to admit that the job is emotionally demanding, as expressing one's feelings can be taken as a sign of weakness (Carleton et al., 2018; Twersky-Glasner, 2005). However, applied research shows that adaptively engaging emotions and objective physiological stress responses can benefit police officers by reducing burnout (Schaiple & Six, 2016) and performance errors (Andersen et al., 2016; 2018). Understanding the potential impact of implicit personality traits on police behaviour remains unknown but could reveal important insights to promote performance during demanding and stressful situations, and improve police training and learning.

1.2 Personality, behaviour, and policing

Personality is a large field of study within psychology and has been defined as a relatively permanent trait quality and operating model, which defines an individual's typical behaviour regardless of place and time. However, research suggests that personality may change flexibly over the lifespan based on a multitude of factors (Helson et al., 2002). Individual and distinct personality traits have been defined in many ways according to numerous measurement scales (e.g., Big Five Factor Model, Minnesota Multiphasic Personality Inventory, NEO Personality Inventory, Personality Research Form, among others), and can be understood as "individual attributes that consistently distinguish people from another in terms of their basic tendencies to think, feel, and act in certain ways" (Ones et al., 2005, p. 390). Even though personality may change, this does not eliminate the need to understand the connection between *current* personality and *current* activity, especially in the context of teaching the basics of police tactics to recruits. In this study, personality and behaviour are measured at the same time in order to develop teaching and learning techniques. It is extremely important to understand how an inexperienced officer's implicit personality traits may influence their interpretation of, and behaviour in, a critical situation. In this way, instructors will have a better understanding of the reasons that may hinder (or promote) performance and can provide individualized feedback that will enhance learning. The results of the current study will support the general aim of all police training, which is to reduce individual's reliance on inherent (i.e., untrained) personality and behavioural tendencies and increase professional skills through practice and experience.

Psychological tests including aptitude and personality assessments are typically administered during the recruitment phase. In policing, personality is a subject of very high interest especially as it pertains to selecting students or officers for basic or specialist training and predicting success and performance in the field (Ghazinour et al., 2019; Henson et al., 2010; Twersky-Glasner, 2005). Detrick and Chibnall (2006) identified personality profiles (according to the NEO Personality Inventory-Revised) for high- and low-performing entry-level officers. However, these profiles were based on field training officer surveys, and not identified by the behavioural performance of actual trainees. As such, there is limited peer-reviewed empirical research that examines the direct relationship between police officers' personality and occupational performance, especially for implicit untrained behaviours elicited during a critical situation.

Previous research investigating the relationship between police officer personality and performance have defined the latter in several ways. Ortega and colleagues (2007) showed

that personality traits are directly related to work-related stress and job satisfaction, which in turn influence individual coping strategies. Sanders (2008) also investigated the connection between the Big Five personality traits and several occupationally relevant content areas for police, including job knowledge, quality and quantity of work, cooperation, dependability, and interaction with the public. Other researchers have defined police performance as problematic behaviours, including citizen complaints, suspensions, subordination, and termination (Aamodt, 2004; Richardson et al., 2007). However, these studies used numerous different personality measures, none of which significantly predicted individual officer performance (Richardson et al., 2007; Sanders, 2008). Further, the various definitions of performance in these studies did not include operational behaviours typically performed in the field, or evaluated during critical incident training.

More recently, Landman et al. (2016) studied the impact of personality traits and professional experience on police officers' shooting performance under pressure. The authors found that police performance was more strongly predicted by experience than personality. This may be due to the operationalization of personality traits by sensitivity to threat, behavioural inhibition, self-control, and thrill-and-adventure seeking instead of the traditional scales mentioned above. Additionally, the connection between personality and behaviour may also be occluded by the operationalization of police performance by shoot/no-shoot decision-making, shot accuracy, and shot timing, which do not reflect other critical tactical dimensions of police performance such as SA. Therefore, the relationship between police personality and complex behaviours performed under high-threat conditions remain unknown.

1.3 Aims

The aim of this study is to establish a universal set of behavioural dimensions for training and evaluating police performance during operational fieldwork simulations. Essential behavioural dimensions of police performance in critical contexts include: control of the environment, operational flexibility, initiative, critical decision-making, withdrawal, and target-oriented behaviour. Observed behaviours (including errors) are not random; instead, their origins may be linked to inherent personality traits. Therefore, a secondary aim of this study is to conduct a preliminary exploration of the possible relationship between personality traits, SA, and performance during simulated critical incidents. To clarify, this study does not aim to define an optimal police personality profile or classify personality traits as 'good' or 'bad' for policing. Instead, the current findings can improve understanding of the inherent personality factors affecting one's behaviour and facilitate learning through concrete and constructive reflections (Honkela et al., 2000). By distinguishing successful and unsuccessful behavioural components, the current study can enrich police evaluation and inform new evidence-based teaching methods tailored to the workforce.

2. Methods

In the current cross-sectional study, police students completed personality assessments prior to participating in four simulated critical incident scenarios to evaluate their performance on a newly defined set of operational behavioural dimensions.

2.1 Participants

The sample ($N = 45$) consisted of 29 male and 16 female students who were second year police recruits at the Police University College of Finland (PUC). The average age of the

participants was 24 years, ranging from 20 to 37. The PUC Principal and Chief of Research approved the study on 12 August 2015. Personality assessments were completed by all participants on the same day in December 2015, and all behavioural assessments were completed in the following two weeks.

An invitation to participate in the study was sent to eligible students through the institute's internal email (Wilma) program. Eligibility was based on completion of basic training in tactics and use of force. Of 109 eligible students who received an invitation, 45 volunteered to participate in the final study (response rate: 41.3%). One participant missed the second week, resulting in $n = 44$ participants included in analyses of training scenarios 3 and 4.

2.2 Measures and Procedure

2.2.1 Personality questionnaire

Personality was assessed using two inventories that are part of the standard psychological entrance examinations at the PUC – Personality Research Form (PRF) and the Mindfindr assessment instrument. PRF has been used for decades in both practice and research applications and has shown significant connections between personality and performance (Bridgwater, 1982; Von Weissenberg, 2017). The test-retest reliability of the Mindfindr instrument has been tested in several samples, including the general population ($n = 68$, interval = 3 weeks, range = $0.87 – 0.94$), and applicants to the PUC ($n = 42$, interval = 6 months, range = $0.74 – 0.82$).

The four personality traits identified by Mindfindr and used in the current study are analogous to universal personality traits identified by the PRF (see Mindfindr, 2020). We define and evaluate the following personality traits:

- **Extraversion:** As a measure of social predisposition, this trait reflects to what extent a person is either outgoing, active and assertive, or rather more private and preferring to concentrate on few activities at a time.
- **Intuitiveness:** This trait describes a person's typical ways of gathering and processing information and relating to his or her environment. Intuitive types consider more abstract concepts and future opportunities, while less intuitive types pay more attention to information provided by their senses.
- **Emotionality:** As a basis of spontaneous decision-making especially in new situations, this trait shows that emotional types place emphasis on their own and other people's values and feelings, while less emotional types rely on logic and take into account objective facts.
- **Flexibility:** This trait describes individual's preferred way of acting, and the level of order and structure in their conduct. Flexible types keep their options open, adapting flexibility in new situations while less flexible types are organized, planful, and conscientious.

Each of these personality traits correlates significantly ($p < 0.001$) with subscales of the PRF as evaluated by three samples, including the current study sample (Table 1).
According to the Mindfindr instrument (Mindfindr, 2020), each personality trait had a score from 0 to 100. Intuitiveness, emotionality, and flexibility have been reverse coded so that higher scores reflect more of each personality type for all four types (i.e., higher score means more intuitiveness, emotionality, flexibility, and extraversion).

Table 1. Validation of Mindfindr personality instrument against Personality Research Form (PRF). Personality traits defined by Mindfindr (2020) have been validated against corresponding dimensions of universal personality traits in the PRF in three adult samples, including the current study sample (n = 45). All correlation values are $p \leq 0.001$.

Mindfindr	PRF	r	n
Extraversion	Affiliation	.556	377
		.459	623
		.469	45
	Exhibition	.454	377
		.574	623
		.490	45
Intuitiveness	Harm avoidance	-0.198	377
		− 0.157	623
		N.S.	45
	Sentience	.193	377
		.150	623
		N.S.	45
Emotionality	Succorance	.237	377
		.166	623
		.579	45
Flexibility	Structure	-0.664	377
		− 0.651	623
		− 0.745	45
	Impulsivity	.582	377
		.564	623
		.610	45

To clarify, we have not dichotomized the personality traits but instead define and evaluate them as continuous variables; individuals are described as being 'more' or 'less', or scoring higher or lower on each of the personality traits defined above. As seen in Figure 1, the distribution of participants across the individual personality dimensions is not balanced, such that police officers in the current study sample tend to score higher in extraversion and lower in intuitiveness, emotionality, and flexibility. These distributions should be kept in mind when interpreting the final results.

2.2.2. Definition and Evaluation of Behavioural Dimensions

The behavioural dimensions identified in this study are intended to reflect implicit actions that we suggest are closely tied to personality, and are readily observable in both trained and untrained officers. All behavioural dimensions defined are connected to Endsley's (2012)
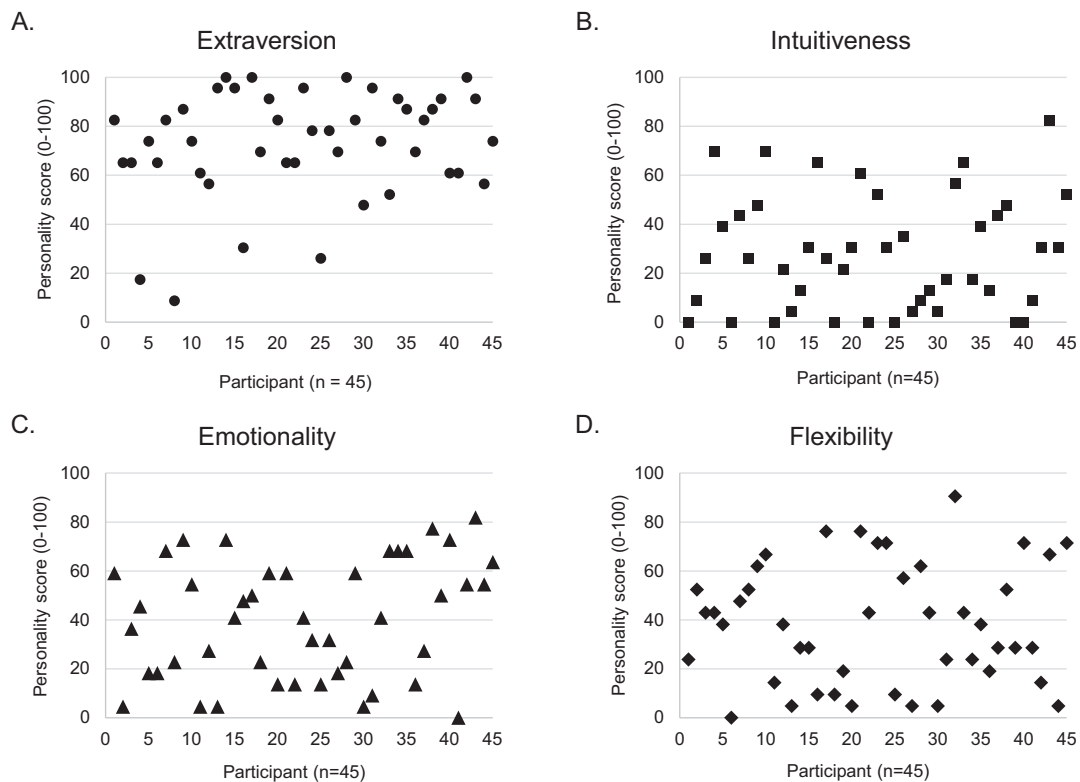
Figure 1. Distributions of personality traits among police recruits. All participants (*n* = 45) completed personality assessments (score 0–100) on four traits: Extraversion (A), Intuitiveness (B), Emotionality (C), and Flexibility (D). Intuitiveness, emotionality, and flexibility have been reverse coded so that higher scores in all personality traits reflect relatively more extraverted, intuitive, emotional, and flexible individuals. Note that the distribution of participants in the current study score relatively higher in extraversion and lower in all remaining personality traits, which means that they tend to be more extraverted and less intuitive, emotional, and flexible.

definition of SA, which involves observing, understanding, and predicting the current situation. However, we acknowledge that this is not an exhaustive list of all possible operational police behaviours required during critical incidents, including tactical manoeuvres (e.g., position, technique, and timing of opening a door, or method of entering a space). The definitions below were mainly established based on the authors' (J-MH and EP) combined 25 years of experience as operators and instructors in use of force and tactics in police, special forces, and military settings. The dimensions identified here reflect untrained, implicit behaviours that are commonly observed during highly stressful and novel situations (i.e., when stress responses elicit primitive actions or reactions). The origins of these behavioural dimensions are unknown but are likely connected to implicit personality traits. The dimensions were also validated by tactical use of force instructors at the PUC and Finnish Federal Special Intervention Unit (SIU) prior to the current study. Definitions and the practical evaluation of the dimensions were further developed based on this feedback.

Individual officer performance was defined according to the following six operational behavioural dimensions, which are followed by example evaluation questions in italics:

Control of the Environment: refers to a person's ability to identify the threats and opportunities posed by the operational environment. Good control of the environment is manifested by being correctly prepared for both unknown ("plus one rule", i.e., the possibility of additional targets or threats) and identified threats, perceiving potential risk elements, taking notice of safe places, and advancing by systematically checking the environment. Good control of the environment allows a police officer to avoid a situation from which there is no escape or being caught by surprise. This behavioural dimension is closely linked to situational awareness, which Endsley (2012) suggested consists of observation of the environment, understanding the "big picture" of the present situation, and anticipating how the situation will develop.

Is the testee able to observe the direction of potential threat in his/her action in space A?

0 = no control of the environs 10 = temporally and spatially comprehensive control of the environs

Operational Flexibility: In police tactical training and the defence forces, operators are often observed showing stereotypical behaviour, which is hard to get rid of even when it proves fruitless. When caught in this kind of behavioural lock, a person does not know how or is unable to change their chosen line of action or break out of their routine. It may be because the individual cannot read the target's reactions or reflect on the target's responses to his/her own actions. Operational flexibility describes a person's ability to adapt his/her own action in relation to the target's response and achieve desired effects. Through reflecting on one's observations, an operationally flexible person is able to adaptively change his/her behavioural pattern, adjust his/her state of preparedness, and respond accordingly to the target's changing actions. An example is a change in the selected instrument of force, or the content of a verbal command as a result of the change in a target's action or the officer's observations. Therefore, operational flexibility can be understood as a combination of personal resilience and purposeful goal orientation, such that this behavioural dimension describes not only an ability to adapt and get through changing and surprising situations, but also vary one's own methods of influence and action in order to achieve the desired goal.

Is the testee able to adjust his/her action in relation to the changing situation after the encounter?

0 = not at all / operational model lock 10 = action flexible as required by the situation

Initiative: Being active and taking initiative are central and widely recognized principles among instructors in military and for police tactics. The party who initiates an action advances the situation actively towards the goal and forces the other party to respond. The initiative to take determined and fast action can stop or limit the opposite party's chances to respond. In police assignments, the initiative in a situation is often first dictated by the opposite party. Therefore, in order to achieve their goal, officers must take initiative. Sometimes, this is possible as a result of actions taken by the opposite party, but often, the officer's initiative must be gained through active, systematic action. A typical way of gaining initiative is limiting the target's choices of action. For example, an officer may take the initiative to block a potential exit or stand in front of bystanders, forcing the target to operate within an allotted space.

Is the testee capable of rational action aiming to take the initiative after establishing contact with the target person at door 3?

0 = no such action 10 = action rational and immediate

Critical Decision-Making: In this study, critical decision-making is expressly defined as an ability to make timely, difficult, yet necessary decisions in challenging circumstances. In extremely stressful situations of police work, these decisions may require carrying out a capture, abandoning an action, or using force up to and including lethal force.

Does the testee shoot (at) the target before the victim gets hit with an axe? Yes/No.

Withdrawal: Eluding a threatening situation is natural human behaviour. However, police work entails facing and responding to human aggression, and suppressing the instinctive drive to evade or withdraw from the threat. As a result, the police can very rarely completely avoid confronting a conflict. Withdrawal can be operationalized through various observable behaviours, including dawdling or replacement behaviour; for instance, when an officer stays put and does less important or less urgent jobs like re-checking spaces they have already cleared, they postpone or avoid going into a threatening situation. Less obvious forms of withdrawal behaviour include doing the right thing unnecessarily slowly, or needlessly repeating completed tasks. Note that a higher score on this scale reflects more inappropriate behaviour (i.e., a lower score is more desirable).

Does the testee show signs of unnecessary replacement behaviour or other efforts to avoid the encounter waiting in space B?

0 = no such signs 10 = very many

Target-Oriented Behaviour: During acutely stressful situations, the human brain instinctively adjusts attention and movement based on target information and decreases priority for addressing larger goals. Therefore, more automatic behaviours are exhibited at the cost of higher order cognitive functioning, like critical decision-making and other processes crucially involved with the behavioural dimensions defined above (Roos et al., 2017; Thayer et al., 2009). Accordingly, adjusting one's behaviour to actively move toward the target (when safe, reasonable, or necessary) is essential for effective police operations. However, if the individual is too focused on the target it can weaken their ability to view the situation as a whole and reduce situational awareness. In the worst case, an officer who exhibits strong target-oriented behaviour may put themselves in a position where they are forced to act; for example, being forced to use a firearm based on the officer's own actions, which could have been avoided by more rational thinking and behaviour. One of the goals of police use of force and tactical training is to limit target-oriented behaviour but instead to perform well-reasoned active and direct behaviours if needed, even in the case of very fast encounters.

Does the testee try to make an immediate arrest as the situation unfolds? Yes/No.

2.2.3. Critical Incident Scenario Description

Behavioural dimensions were evaluated during four simulated police intervention scenarios by highly qualified external evaluators from the PUC. Each participant independently performed the same four scenarios in the same order, which were all arranged indoors at the PUC simulation hall. The hall is an open, heated 272 m² space in which partitions were built using mobile walls and doors. Participants wore their personal field outfits and equipment and were given protective glasses and a non-lethal training gun and ammunition (FX-simunition). Evaluators provided participants with background information and instructions orally and in writing one minute before the beginning of each scenario. The four scenarios were demanding encounters that required participants to check and clear various spaces, use lethal force (2 of 4 scenarios), use appropriate verbal commands to safely de-escalate the situation, apprehend an armed suspect, and take into account the security of bystanders.

Each scenario had at least one evaluation question for each behavioural dimension (see above) with the exception of Scenario 3, which was missing withdrawal behaviour. Every set of evaluation questions was tailored to the specific content of each scenario and its environment and surroundings. Most of the behavioural dimensions (control of the environment, operational flexibility, initiative, withdrawal) were evaluated using a visual analogue scale. Evaluators marked a 10-cm line with a traverse depending on how the participant had performed. The traversed line was measured with a ruler to obtain a score in millimetres that ranged from 0 to 100. Target oriented behaviour and critical decision-making were evaluated as binary (yes/no) variables. After determining that independent evaluator responses were highly correlated with each other, average scores were calculated for each question and used in the final analyses.

2.3 Statistical Analysis
Shapiro Wilk tests on the four personality traits and continuous scores on behavioural dimensions showed that several of the variables violated the assumption of a normal distribution ($ps < 0.05$, Figure 1). Therefore, Spearman correlations were used to test the relationship between personality and behaviour. Significance criteria was set at $p < 0.05$ and was not corrected for multiple comparisons in order to explore very preliminary but highly novel insights on the potential relationship between police behaviour and personality during simulated critical incidents.

3. Results
Table 2 provides an overview of the significant relationships identified between personality traits and behavioural dimensions of operational police performance evaluated in the current study.

Table 2. Relationships between personality traits and behavioural dimensions in police. Only significant ($p < 0.05$) correlations are shown, based on the full study sample ($n = 45$) that performed four different critical incident scenarios. *$p < 0.05$ **$p < 0.01$

	Extraversion	Intuitiveness	Emotionality	Flexibility
Control of the environment	$r_s = -0.44$** $r_s = -0.30$*	–	–	$r_s = -0.32$* $r_s = -0.31$*
Operational flexibility	$r_s = -0.30$*	–	–	$r_s = -0.38$* $r_s = -0.36$* $r_s = -0.32$*
Initiative	–	–	–	$r_s = -0.41$**
Critical decision-making	$r_s = 0.31$*	–	–	–
Withdrawal	–	–	$r_s = 0.31$*	–
Target oriented behaviour	$r_s = 0.30$*	–	–	–

3.1 Control of the environment
Control of the environment was negatively correlated with extraversion scores ($r_S = -0.44$, $p = 0.003$; $r_S = -0.30$, $p = 0.046$), where participants who scored higher in extraversion were less likely to observe the direction of potential threat in his/her space, and less likely to check all

scenario spaces. Control of the environment was also negatively related to flexibility scores, such that individuals who scored lower in this personality trait (i.e., were less flexible) were more likely to observe the direction of potential threat in his/her space (scenario 1: $r_S = -0.31$, $p = 0.036$; scenario 3: $r_S = -0.32$, $p = 0.036$).

3.2 Operational Flexibility

Operational flexibility was negatively correlated to extraversion ($r_S = -0.30$, $p = 0.048$), such that participants who scored lower in extraversion were better able to adjust their own behaviour in response to the changing situation. Several measures of operational flexibility revealed significant negative correlations to the flexible personality trait, such that participants who scored lower in flexibility demonstrated better performance on the following measures: After the suspect shoots, how fast does the participant seek cover? ($r_S = -0.32$, $p = 0.034$, $n = 44$); Does the participant modify his/her level of anticipation (after the shots)? ($r_S = -0.36$, $p = 0.017$); Is the participant able to adjust his/her action to correspond to the changing situation after the encounter? ($r_S = -0.38$, $p = 0.011$).

3.3 Initiative

A significant negative correlation with the flexibility personality trait ($r_S = -0.41$, $p = 0.005$) revealed that participants who scored lower in flexibility had improved capability of logical goal-oriented action in order to gain control of the situation.

3.4 Critical Decision-Making

Critical decision-making was significantly related to extraversion ($r_S = 0.31$, $p = 0.037$), such that participants who shot the target person before it was lawfully justified (scored as a '1') scored higher in extraversion.

3.5 Withdrawal Behaviour

Withdrawal behaviour was positively related to emotionality ($r_S = 0.31$, $p = 0.041$), such that participants who scored higher in emotionality (i.e., more emotional dependence) were more likely to demonstrate signs of unnecessary replacement behaviour or other efforts to avoid the encounter.

3.6 Target-Oriented Behaviour

Target-oriented behaviour was marginally related to extraversion ($r_S = 0.30$, $p = 0.049$), such that more extraverted individuals were more likely to go after the target person in a manner that compromised their safety and tactical position.

4. Discussion

The current study evaluated police performance during simulated critical incidents using six universal dimensions of operational police behaviour, which should be considered during training and evaluation. We provide preliminary evidence for several significant relationships between these functional dimensions of police behaviour and personality traits. More flexible personality types scored lower in operational flexibility, control of the environment, and initiative relative to less flexible individuals. Higher scores in extraversion were related to lower performance in control of the environment and operational flexibility. Similarly, we found that more extraverted participants made more errors in critical decision-making and behaved in a more target-oriented manner putting themselves at risk. Finally, participants

higher in emotionality were more likely to demonstrate signs of unnecessary withdrawal behaviour. There were no significant relationships found between the intuitive personality trait and behaviour during simulated critical incidents. Together, the current findings provide police instructors and educators with a standardized set of criteria for training and evaluating the most essential behavioural skills for police. By understanding the contribution of individuals' inherent personality traits on performance in each dimension, police training and education can be optimized. Specifically, officers who show high levels of extraversion, flexibility, and emotionality in their entrance examinations should receive focused instruction and training to improve their operational performance in critical contexts.

The personality trait of flexibility revealed several significant relationships with behavioural dimensions of police performance. According to the personality assessment used in the current study (Mindfindr, 2020), flexible personality types are curious and open-minded, understanding and adaptive to situations in a more impulsive and spontaneous way. Flexible types might operate adaptably in non-critical police operations, such as during more verbal interactions (e.g., helping a lost elderly person who cannot provide a lot of information). But in the current study, more flexible individuals scored lower in control of the environment, operational flexibility, and initiative during critical incidents. This may be due to the nature of critical incidents that not only require fast action, but also adapting one's actions in relation to the changing situation (i.e., target's responses, environment) in order to achieve the desired goal. Therefore, more systematic, goal-oriented behaviour as seen among less flexible personality types was beneficial to operational flexibility, as well as for initiative and control of the environment. The label of a flexible personality type, in this case, can be misleading, as their thinking and action patterns can also be more 'chaotic'. This may put more flexible individuals at risk in critical situations unless they are trained to be more systematic and methodical in their evaluation and understanding of SA.

In decisions requiring the inhibition of a use of lethal force (i.e., no-shoot decision), participants who scored higher in extraversion performed worse than those who scored lower in extraversion. These results are consistent with observations by experienced police instructors of a natural willingness of extraverts to approach people in general, as well as in dangerous and uncertain situations. While this trait may be advantageous and adaptive for police to exhibit in general and is dominantly reflected in the personality distribution of the current sample (Figure 1A), police training should directly address the potential behavioural vulnerabilities associated with greater extraversion. According to the current results, other potential vulnerabilities include less control of the environment, less operational flexibility, and higher target-oriented behaviour among more extraverted participants, whose natural tendencies to be more instinctual and spontaneous are indicative of lower SA. To mitigate these effects, police trainers could direct more extraverted individuals to utilize their dominant, outgoing, and assertive nature to act in a way that is more focused and objective.

Avoiding threatening situations is a natural, adaptive human response, even in critical police encounters. In moderation, withdrawal minimizes individual risk and facilitates careful and cautious action. When this behaviour increases, however, it may prevent an officer from successfully proceeding through their assignment and postponing more urgent actions. From the involved parties' or victim's point of view, help is unnecessarily delayed, and the situation may worsen as time passes. At worst, withdrawal behaviour can be so strong that an officer will completely evade a threatening situation. The only significant connection between this behavioural dimension and personality was with emotionality. Individuals who are more sensitive to their own subjective impressions and emotions show greater withdrawal behaviours. Conversely, individuals with a more objective, logical, and

evaluative approach may be better at suppressing withdrawal behaviours. This is supported by the findings of greater control of the environment, operational flexibility, and initiative among more structured (i.e., less flexible) personality types.

4.1 Limitations and future directions

Limitations of the current study include homogeneity of personality traits among the sample of police recruits (Figure 1), and possibly among individuals selected for police work in general (Tversky-Glasner, 2005). However, there is no empirical research that systematically reports outcome-based police personality profiles (Detrick & Chibnall, 2006), and indeed a general lack of recent peer-reviewed literature on police personality traits and their direct connection to critical incident behaviours. Contributing to this problem is a lack of standardization for pre-employment personality assessments used across police agencies and in other occupations. Furthermore, there is a lack of universal and evidence-based definitions for police performance that can be utilized during training and evaluation (Di Nota & Huhta, 2019). The behavioural dimensions defined in the current study (Section 2.2.2), and in other recent police performance studies (Bertilsson et al., 2019), are based on the observations and operational experiences of expert instructors, as well as established (but unwritten) standards of police practice. The current study takes a preliminary look at the possible connections between personality data gathered during police pre-employment screening in order to provide important and novel insights to subsequent performance outcomes.

Police culture often tends to 'downplay' the role of emotions and subjective feelings of stress, as they can be seen as signs of weakness and cause doubt in your partner's abilities (Carleton et al., 2018; Twersky-Glasner, 2005). Stress has also been shown to reduce officers' memories of their own performance (Lewinski et al., 2016), as well as degrade performance (i.e., decision-making) during critical incidents (Nieuwenhuys & Oudejans, 2011). Physiological stress responses also lead to a greater reliance on implicit skills, and reduce brain activity responsible for more deliberate, effortful decision-making (Roos et al., 2017; Thayer et al., 2009). Therefore, future research that continues to explore how inherent personality traits inform these automatic, implicit behaviours in critical police encounters is extremely important, and informed the current study design.

Previous studies that provide officers with objective feedback of their stress responses during training have shown significant and long-term improvements in SA and critical decision-making (Andersen & Gustafsberg, 2016; Andersen et al., 2018). Similarly, providing officers with objective feedback on the possible connections between their personality traits and behaviour could also improve learning and future performance outcomes. When the current sample was provided preliminary results and a teaching module on the relationship between personality traits and behaviour, the participants expressed great interest and increased knowledge. Specifically, their feedback on a 6-point Likert scale (0 = *not at all*; 5 = *very much*) suggested that the information was helpful in increasing their understanding of how inherent personality traits can influence operational behaviours and decision-making processes (mean score = 4.3), and that this knowledge could contribute to choosing safer tactical solutions in future situations (mean score = 4.6). These data also provide preliminary evidence for the acceptability of integrating information about individual personality traits into police tactical and use of force training.

Multiple regression is one useful type of analysis that could reveal the predictive relationship between personality traits and performance during high-stakes encounters. Vasilopoulos et al. (2007) investigated the linear and curvilinear relationships between two types

of personality measures (factor and facet scales) and subsequent training scores among law enforcement personnel. Consistent with the Yerkes and Dodson (1908) model, training grades were better predicted among individuals at extreme ends of the personality distributions, suggesting that extreme personality types may show different (i.e., worse) performance than less extreme types. The current findings of lower scores across multiple behavioural dimensions among individuals who scored high in extraversion (Table 2) are consistent with this notion. Although we explored the current dataset with linear and quadratic regression analyses, our relatively small sample size ($n = 45$) contributed to a lack of sufficient statistical power but would be of great interest in future research among police.

5. Conclusion

The current findings connecting personality traits to operational police behaviours should not be interpreted to prioritize (or undermine) specific personality traits relative to others in police pre-employment screening. In contrast to Detrick and Chibnall (2006), the current findings suggest that there is not an ideal police personality profile because different traits might be better than others depending on the specific task. Similarly, Landman et al. (2016) concluded that instead of selecting police officers based on specific personality traits, that these inherent factors should be the focus of training and improving their abilities in challenging circumstances. The current preliminary results identify several personality-behaviour relationships that can be used to develop and implement personalized training and feedback.

Above all, it is our hope that increased understanding of the objective link between an individual's personality and their own actions revealed by the current findings will help to identify potential behavioural tendencies (both adaptive and maladaptive) in critical situations. By clarifying these evidence-based relationships, police training can utilize officers' inherent strengths to exemplify positive performance, while also developing effective training to prevent or reduce performance errors based on inherent vulnerabilities. In this way, the current findings can be used to practically enhance learning, improve self-reflection, and promote effective policing and occupational safety.

Declaration of Conflicting Interests

Author MN is a cofounder and co-owner of one of the personality assessments used in the current study (Mindfindr) but did not receive any compensation (financial or otherwise) for the collection, analysis, or reporting of data for this article. No other potential or actual conflicts of interest are declared.

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