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Norwegian Police Use of Firearms: Critical Decision-Making in Dynamic and Stressful Situations

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Abstract
This is the first study of police decision-making regarding the use of firearms in the Norwegian context; its purpose is to study how police emergency response officers make decisions on the use of firearms, and to understand the contextual factors underlying these decisions. The data stem from document analysis based on developed categories, and interviews with police officers with experience in using firearms during their service, analysed by the Systematic Text Condensation method. The findings show that when handling armed confrontations, police officers draw upon recognition from previous experience and use a combination of analytical and intuitive decision-making, and that the basis for decisions to fire are situational cues to which the officers respond. Key contextual factors are the stressful conditions and the commonly short distances when shots are fired. A finding in this study is that Norwegian police officers frequently hold their fire until a threatening situation has materialized into an attack, and potentially find themselves in imminent danger as a result.

Keywords
Norway, police–public encounters, police use of firearms, police use of force, recognition-primed decision-making

1 Introduction

Perhaps the most difficult decision a police officer may have to make, on behalf of the state, is whether to use firearms when they may result in a fatal outcome (Punch, 2010; Squires & Kennison, 2010). In the Norwegian context, policing and firearm use differ in one important respect from those in many other countries because Norway is one of only five of the 34 member countries of the Organization for Economic Co-operation and Development (OECD) that routinely deploys unarmed police[1] (Hendy, 2014). However, this deployment

model has been challenged in recent years. The Norwegian police has experienced a sharp increase in the number of armed assignments, which have risen from 1,507 in 2007 to 5,816 in November 2016 (Politiet.no, 2019a), and all police emergency response officers were temporarily armed in response to heightened terrorist threats during the period from 25 November 2014 to 3 February 2016 (NOU 2017:9, p. 130). Following a public debate, the Firearms Commission appointed by the Norwegian government recommended that Norway should continue to deploy unarmed police (NOU 2017:9) and the use of firearms by Norwegian police remains restricted. During 2002–2014, on average, police made use of (discharged) their firearms for 2.5 incidents per year (Politiet, 2019b). The Norwegian Bureau for the Investigation of Police Affairs (NBIPA) conducts mandatory investigations of all incidents in which police have discharged their firearms against a person and publishes these investigations in its Decisions of Prosecutions. These documents currently provide the best insight into police use of firearms, as accessible official statistics is limited. Despite the substantial change in the prevalence of armed police responses, and to the best of our knowledge, there have been few efforts at the national level to increase understanding of police officers' decisions regarding the use of firearms, and what characterizes the situations in which they are used.

Use of lethal force by police officers lies at the extreme edge of policing (Burrows, 2007), and "there is a fine line between the use of necessary force to achieve legitimate police objectives and the use of excessive force" (Boulton & Cole, 2016, p. 291). Police officers frequently face demanding and dangerous situations in which their judgement and decision-making expertise is of the greatest importance (Flin, Pender, Wujec, Grant & Stewart, 2007). Police officers' performance is influenced by a span of cognitive factors, and many of these are seldom considered when planning police operations or during subsequent investigations (Kavanaugh, 2006). To enhance the quality of decisions, the cognitive factors involved in decision-making must be understood (Dror, 2007). To the best of our knowledge, there have not been any studies conducted on the decision-making of Norwegian police officers regarding the use of firearms in real-life incidents. Nor have such experiences been elaborated on in official reports, such as the Firearms Commission's report considering routine arming of the Norwegian police (NOU 2017:9).

1.1 Previous research

The purpose of the literature review is to form an overview of research on police use of firearms that is relevant to this study, and to position this study in relation to similar research conducted internationally and in Norway. Internationally, an extensive body of research has addressed various perspectives on police use of firearms. These studies include: police use of firearms (Belur, 2014; Best & Quigley, 2003; Glass, 2007; Klinger & Rosenfeld, Isom & Deckard, 2016; Petersson et al., 2017), police use of lethal force (Belur, 2010; Fyfe, 2002: Klinger, 2012; McElvain & Kposowa, 2008; Nix, Campbell, Byers & Alpert, 2017; Shane & Swenson, 2018; Zimring, 2016); use of firearms and perceptual distortions (Klinger & Brunson, 2009); policies and police use of firearms (Jennings & Rubado, 2017; Punch, 2010; Squires & Kennison, 2010; White, 2001); shooting performance and behaviour under threat (Nieuwenhuys, Cañal-Bruland & Oudejans, 2012, 2017); the impact of professional experience and personality on shooting performance under pressure (Landman, Nieuwenhuys & Oudejans, 2016); the development of reporting on police use of firearms (Arslan & Farkas, 2015; Richardson, Vil & Cooper, 2016); police officer features and use of firearms (Donner,

1. The four other OECD countries are New Zealand, Iceland, Ireland, and the UK (excluding Northern Ireland).

Maskaly, Piquero & Jennings, 2017; Ridgeway, 2016) and consequent implications for police firearms training (Lewinski, Avery, Dysterheft, Dicks & Bushey, 2015; Morrison, 2009). Although this diverse literature addresses a wide range of factors that influence police use of firearms, previous research on police use of firearms and decision-making is of special importance for this study. For example, Burrows (2007) who explored issues affecting critical decision-making by police firearms officers in the United Kingdom. He concludes that the outcome of the first contact between the subject and the police is dependent on the officer's competence, and that "procedures developed in firearms training will be ultimately reflected in the operational arena" (Burrows, 2007, p. 282). In this context, Boulton & Cole (2016) examined the impact that expertise had on British police decision-making during armed confrontations. Their findings showed that expert firearms officers are more flexible in adapting to changes in the operating environment than less experienced officers. Focusing on individual capacity, Kleider & Parrott (2009) examined whether working memory capacity affected shooting decisions in (simulated) tasks with various levels of threat. Their findings suggested that, irrespective of threatening circumstances, limited working memory capacity can increase the risk of aggressive shooting behaviour. Furthermore, Mitchell and Flin (2007) investigated whether briefing information, provided prior to seeing a firearms incident in a simulator, affected police officer's decisions to shoot in Scotland. The findings in this study suggested that briefing information did not influence the shooting decisions by the firearms officers, but they attended to the cues in the scenario and responded accordingly. Verhage, Noppe, Feys and Ledegen (2018) reported on two studies, focusing on experiences from the use of force, and the influence of stress on Belgian police officer's decision-making, assessment abilities and shooting accuracy. Amongst their findings, results showed that stress and fear affected officers' decision-making process. A main finding in this study is that "Belgian police officers are anxious about the consequences of their actions because they know they will be held accountable for them" (Verhage et al., 2018, p. 345). Finally, Wheeler (2018, p. 48) examined police firearms incidents in the USA, and found that situational factors in terms of whether the subject was armed and whether an officer was injured were the best predictors of police decisions to shoot. Given the widespread international research on police use of firearms, it is fair to say that comparable research in Norway is limited. For example, the police`s use of firearms in Norway (Myhrer & Strype, 2010); examination and comparison of police use of firearms in Norway and Sweden (Strype & Knutsson, 2002; Knutsson & Strype, 2003), and in the Nordic countries (Knutsson, 2005; Knutsson & Norèe, 2010).The present study was funded by the Norwegian Ministry of Justice and Public Security.

1.2 Purpose of the study

The research problem examined in this study is how Norwegian police emergency response officers make decisions on the use of firearms, and which contextual factors underlie these decisions. The remainder of the article is organized into six sections, as follows. Following the introduction, we describe the theoretical framework in Section 2. In Section 3, we report the research methods. In Section 4, we present our findings concerning selected key characteristics and the interview results. In Section 5, we discuss the findings through the lens of our theoretical framework, before we conclude and provide suggestions for future research in Section 6.

2 Theoretical framework

The theoretical framework begins with understanding armed assignments as potential crises that require critical decision-making. We will briefly present crises and crisis management, followed by decision-making from a naturalistic decision-making perspective, which includes recognition-primed decision-making, situational awareness, experience, analytical vs intuitive decision-making and decision-making under stress.

2.1 Crisis and crisis management

Whether a situation can be defined as a crisis often involves subjective points of view (Engen, Kruke, Olsen, Olsen & Pettersen, 2016). Rosenthal, Charles and 't Hart (1989, p. 10) define a crisis as "a serious threat to the basic structure or the fundamental values and norms of a system, which under time pressure and highly uncertain circumstances necessitates making critical decisions". It is fair to assume that an armed confrontation (i.e. threatening or violent direct contact between the parties where firearms have an inherent potential to be used) can be defined as a crisis. The context in which armed confrontations exist or occur can be characterized by time pressure, risk, ill-structured problems, uncertainty, unpredictability, multiple and shifting goals, several individuals, stress and the need for critical decision-making, as described by many researchers (e.g. Boin & 't Hart, 2001; Endsley, Hoffman, Kaber & Roth, 2007; Gundel, 2005; Klein, 2008; Kruke, 2012; Lintern, 2010; Orasanu & Martin, 1998; 't Hart & Boin, 2001). There are many typologies of crises, such as development and termination patterns ('t Hart & Boin, 2001), and examinations of the degree to which crises are predictable and influenceable (Gundel, 2005). A fast-developing and unpredictable crisis will be particularly challenging to the responder, calling for swift decision-making. Thus, crisis management concerns management practices in response to non-routine phenomena and developments (Rosenthal, Boin & Comfort, 2001, p. 15). Within the Norwegian police, the designated on-scene commander (alternatively, another designated police officer) is responsible for on-scene incident management (Politiet.no, 2019c, p. 147). However, the police response and crisis management must rely on the actual police resources present at the scene of the incident (NOU 2012:14). Ultimately, regardless of his or her level of professional experience, the individual police officer facing the threat has to manage the situation and undertake critical decision-making during an armed confrontation.

2.2 Decision-making

Naturalistic decision-making attempts to understand how individuals make decisions in real-life situations that are familiar to them (Lipshitz, Klein, Orasanu & Salas, 2001) and, specifically, seeks to provide descriptions of how these decisions are made (Nemeth & Klein, 2010). The environments on which NDM focuses may involve time pressure, risk, ill-structured problems, uncertainty, multiple and shifting goals, several individuals, and experienced decision makers (Endsley et al., 2007; Klein, 2008; Lintern, 2010; Lipshitz et al., 2001; Orasanu & Martin, 1998). Zsambok (1997, p. 5) describes naturalistic decision-making as consisting of four defining markers: (1) contextual factors; (2) experienced research participants; (3) a focus on the decision strategies that individuals actually use rather than "should" use; and (4) inclusion of situational awareness (SA), diagnosis and plan generation in the decision period, rather than just focusing on the moment of decision. Naturalistic decision-making studies examining important factors influencing how experienced professionals make decisions cover contexts including fire ground command (Klein, 2008), avia-

tion (Orasanu & Fischer, 1997) and police situational judgement (Flin et al., 2007). The factors considered include SA and failure to recognize a situation (Orasanu & Martin, 1998). SA is defined as "the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning and the projection of their status in the near future" (Endsley, 1995, p. 36). Weick and colleagues follow a similar logic in their research on collective mindfulness and sensitivity to operations when organizations strive to create and maintain an integrated "big picture" of the moment through ongoing attention to real-time information (Weick, Sutcliffe & Obstfeld, 1999). Another research trend is sense-making, popularly described by Boin and colleagues as "what the hell is going on" (Boin, 't Hart, Stern & Sundelius, 2005), and defined by Weick, Sutcliffe and Obstfeld (2005, p. 409) as "the ongoing retrospective development of plausible images that rationalize what people are doing". However, a notable difference between sense-making and situational awareness is that sense-making generally involves looking backward, whereas situational awareness involves looking forward (Endsley, 2015).

Recognition Primed Decision-making is a naturalistic decision-making model that describes decision-making in situations characterized by time pressure and changing conditions (Klein, 1997). The key factor in recognition-primed decision-making is recognition. Experienced individuals can recognize and judge a situation as familiar or typical based on recognition of one or more critical elements in the current situation compared with a similar previous experience. This recognition then supports development of a course of action comparable with the one that had been effective in the prior experience (Klein, 1998; Lintern, 2010). Decision makers rely on their experience and ability to quickly recognize a situation as a way of providing effective options in a given context (Klein, Calderwood & Clinton-Cirocco, 2010) and in attempting to project into the future and predict what is going to happen or prepare for it (Klein, 1998). Reliance on previous experience to recognize elements in a given situation makes situational awareness a key factor for decision-making in dynamic contexts. Thus, SA and naturalistic decision-making are decisively connected (Pfaff et al., 2013). Situational awareness provides "the primary input to the decision process and the basis for decision strategy selection" (Endsley, 1997, p. 281). Endsley (1995, p. 36) distinguishes between three levels of situational awareness. Level 1 encompasses the individual's perception of information in the environment, and comprehension of the meaning of these elements represents level 2. Decision makers who have achieved level 3 are able to project the future status of the environment, and may use this ability to project probable future outcomes when choosing one course of action over another (Pfaff et al., 2013). Situational awareness forms a quick and intuitive impression of the situation based on principles for pattern recognition, and the situation is categorized into possible outcomes. This intuitive situational understanding can be based on learned relationships from previous complex situations (Eid & Johnsen, 2006). Individual factors, such as the decision maker's training and experience, are essential factors for situational awareness during dynamic decision-making, particularly for experienced decision makers (Endsley, 1997).

The key aspect of naturalistic decision-making is experience (e.g. Klein, 1997; Pruitt et al., 1997; Zsambok, 1997), which implies that the decision maker may draw upon previously experienced situations. Experience is considered the most important factor for learning within the police (Paoline & Terrill, 2007), and Lindøe (2003) refers to such experiential learning as a form of learning based upon practical situations, which provides personal experience as well as learning. In real-life contexts, police officers' assessments of an individual's behaviour will rely on both given information and previous experiences in training

and real-life situations (Burrows, 2007). However, naturalistic decision-making research underlines that there are distinct differences between expert and novice decision-making (Kahneman & Klein, 2009), and inexperience has been identified as contributing to poor judgement because the inexperienced decision maker did not have an adequate understanding of the situation (Klein, 1993). Dreyfus (1997, p. 19) describes a five-stage model of skill acquisition, progressing from novice, to advanced beginner, then competent, proficient and, finally, expert. At the highest level of skill, experts have sufficient experience gained from a variety of situations to replace consideration of each situation with intuitive and immediate responses.

In line with the five-stage model, skilled intuition is an endpoint of learning and a central aspect of expertise. Klein (2011, p. 71) describes intuition as the way in which we use our experience without consciously thinking things out. Simon (1992, p. 155) provides the following definition of skilled intuition: "The situation has provided a cue: this cue has given the expert access to information stored in memory, and the information provides the answer. Intuition is nothing more and nothing less than recognition." Intuitive decision-making is based on previous experience (Eid & Johnsen, 2006; Klein, 2011), and Sjøberg (2003) finds that extensive training can lead to a semi-automatic mode of functioning, comparable with intuition. Experience enables the individual to draw upon associations from previous experienced situations, and quickly make a decision without the need for an actual comparison between alternative courses of action (Klein, 2008), such as normally occurs in analytical reasoning. Analytical reasoning and decision-making focuses on goals and is a systematic process evaluating different options to identify the best decision (Boulton, 2014). According to Helsloot and Ruitenberg (2004), individuals may use two very different approaches in deciding how to act when confronted by an accident or crisis. Intuitive reasoning is associative, affectionate, automatic, emotional and unconscious. In contrast, analytical reasoning is founded on rules of reasoning, algorithms and formal logic. An analytical approach is slow, whereas intuitive reasoning is swift. The distinction between the two styles of thinking, one intuitive and fast and the other deliberate and slow, has been widely supported (Frankish & Evans, 2009). Kahneman (2011, p. 20) refers to the two ways of reasoning as "system 1" and "system 2". System 1 operates automatically and is fast, involuntary and effortless, whereas the deliberate activities of system 2 are voluntary, controlled and effortful. System 2 reasoning imposes demands on restricted attentional resources (Kahneman & Klein, 2009, p. 519) and may be disrupted if attention is drawn away (Kahneman, 2011).

2.3 Decision-making under stress

Police officers exposed to armed confrontations experience acute stress, as occurs when individuals face sudden danger or life-threatening situations (Verhage et al., 2018). According to Kowalski-Trakofler and Vaught (2003), stress is one of the crucial factors underlying the demands imposed on decision makers in such situations. Salas, Driskell and Huge (1996, p. 6) define stress as "a process by which certain work demands evoke an appraisal process in which perceived demands exceed resources and result in undesirable physiological, emotional, cognitive and social changes". A key factor is that demands exceed resources or the decision maker's capacity. The demands may arise from factors such as threats or social factors interacting with the human resources, which are reliant on several factors, such as training, experience, physiological limitations and individual perception (Kowalski-Trakofler & Vaught, 2003, p. 2). Activation of a stress response in such contexts may affect perception and cognition, and a primary cognitive reaction to stressors is reduced

working memory capacity (Klein, 1996). In addition, acute stress may elicit physiological and psychological responses, such as increased heart rate, perceptual narrowing (tunnel vision), time distortion (slow time perception), auditory exclusion (temporary loss of hearing) and focused attention (Cooke, Kavussanu, McIntyre, Boardley & Ring, 2011; Kavanaugh, 2006; Kowalski-Trakofler & Vaught, 2003; Verhage et al., 2018). Stress resistance may vary with the familiarity of the problem at hand, and stress may especially affect decision-making in situations characterized by ambiguous cues and goal conflicts (Orasanu, 2016).

3 Methods

The data in this study are based on an analysis of 24 (of a total of 28) Decisions of Prosecution documents by the NBIPA for the period from 1 January 2005 to 31 December 2018,where the police`s use of firearms against persons have been investigated. Forensic reports from the same 24 individual investigations were included. The documents provide summaries of the investigations and detailed insights into technical data. NBIPA routinely investigates all incidents in which the police have discharged their firearms against individuals, and all incidents in this study have been filed without any legal consequences for the officers involved. Three experts in tactics and firearms training at the Norwegian police university college (PHS) participated in designing the scope of the document analysis. It was focused on relevance for training in armed response for police emergency response officers. In Norway, these officers are divided into four categories, depending on their competence and extent of annual operational training: (1) The counter terrorist unit, (2) The dignitary protection, (3) The Police special response units, and (4) Police emergency response officers (Politiet.no, 2019c). A matrix of 16 themes (e.g. distances and number of rounds fired) was prepared, after which all documents reviewed and information for each issue recorded. Although the legal documents provide relatively extensive information on the incidents in question, the documents were considered insufficient for examining individual decision-making on the use of firearms. Thus, 10 interviews were conducted with police emergency response officers who had experienced situations in which they intentionally discharged their firearms against a person. We applied a sampling strategy based on three criteria, selecting data that: (1) are included in the period from the establishment of the NBIPA in 2005 to date; (2) cover incidents that fall under the two main categories in the police firearms instructions allowing use of firearms (for self-defence and to perform an arrest); and (3) deal with incidents resulting in both injuries and fatal outcomes. The interviewees (all men) were recruited from various regions across Norway. At the time of the incidents, their average age was 33 years and they were all wearing uniform. It must be noted that the number of interviewees is limited, which may have implications for the potential for generalization of the findings in this study. At the same time, there are few incidents in Norway in which the police have used firearms, and the number of interviewees represents almost half of all the incidents examined in this study.

Data were obtained from semi-structured, audio-taped interviews and had an average duration of approximately one hour. The interviews were conducted during September and October 2018 and took place, according to each informant's wishes, in their home, at their workplace, via video conference or at one of the PHS departments. The interviewer was a police officer with professional experience as a member of the police emergency response personnel. The study was introduced to the interviewees as being part of a research project on police use of firearms, focusing on their experiences, and all interviewees signed an

informed consent form. The interviewees were provided with a developed analogue visual scale (ranging from 1–10, where 1 means no similarity and 10 means very similar). The interviewees were asked to rank how similar they found the incident to be compared with their previous operational training and professional experiences. The semi-structured interview guide included questions on the assignment, the preparation, the confrontation and decision-making regarding their use of firearms. The interviewer transcribed the interviews. Analysis focused on the interviewees' experiences, in particular what caused the decision to use firearms, and was performed in accordance with Malterud's (2012) systematic text condensation method. NVivo 12 was used to support the analysis. In the first step, all transcripts were reviewed, and preliminary themes developed. Techniques to identify themes were repetitions, similarities, and differences in the data (Ryan & Bernard, 2003), and a semantic approach focusing on the explicit meanings as expressed by the interviewees was utilized (Braun & Clarke, 2006). In step two, identification, and sorting of meaning units were carried out, as well as transformation of preliminary themes into codes. The third step implied sorting the meaning units into subgroups under each of the established codes, before reducing the contents in each subgroup into a condensate – "an artificial quotation maintaining, as far as possible, the original terminology applied by the participants" (Malterud, 2012, p. 799). In the fourth and final step, the condensates for each subgroup were transformed to analytical texts, providing commonalities and variations amongst the interviewee's stories. Quotes from the interviewees were also used to complement the result categories. Finally, the result categories and the original transcriptions were reviewed to secure a valid representation of the original contexts.

4 Findings

In this chapter, we present selected key characteristics from the document analysis in section 4.1, and the main findings from the interviews with police officers who had experienced using their firearms in section 4.2.

4.1 Selected key characteristics

During the period 1 January 2005 to 31 December 2018, the NBIPA routinely investigated a total of 28 incidents in which police had discharged their firearms against a person. As four of these incidents were still under investigation or occurred during this study, they were not included in the data portfolio. Table 1 provides a summary of the findings from the reports of the key characteristics of police use of firearms. These findings are based on analysis of the 24 Decisions of Prosecution documents by NBIPA and related forensic reports.

Table 1 Selected key characteristics of police use of firearms against a person.

Characteristics	Findings
Number of assignments/ armed assignments (by November) in 2016	A total of 786,686 registered assignments occurred, of which 5,816 were armed assignments (Politiet.no, 2019a). The police discharged their firearms in two assignments (representing 0.034% of the armed assignments).
Prevalence of use of firearms	The annual average number of incidents in which police use firearms is two (based on all 28 incidents).
Use of less coercive measures	In 23 of the 24 incidents included in our data set, the police used less coercive measures (e.g., verbal warnings or pepper spray) before resorting to firearms. In one incident, the police immediately responded to a threat with firearms.
Number of shots fired by the police	The average number of shots fired by the police in the 24 incidents was approximately 3.5, with a median of 1. In 13 incidents, one police officer fired one shot.
Subject arming	Of the 24 incidents, the subject was armed with a firearm[1] in 14 incidents and with another weapon (e.g., a knife) in eight incidents. In the two remaining incidents, the subject was not carrying a weapon on his/her body when shots were fired.
Distance between subject and police	The average distance between police and the subject (based on 21 of the 24 incidents) was approx. 8.5 m, the median distance was 5 m, with a range of approximately 1–60 m.
Subject actions at the time shot(s) fired	In 21 out of 24 incidents, the subject had carried out or was in the process of carrying out an attack.[2] In two incidents, firearms were used to perform an arrest, and in one incident, shots were fired to prevent a suicide. In 10 incidents, the subject was moving when shots were fired (walking or running).
Estimated time from when confrontation occurred until police fired shots	In 11 out of 24 incidents, there was approximately one minute or less from the time when the confrontation occurred until shots were fired. In the remaining 13 incidents, it took longer for shots to be fired.
Outcome—subject	For the 24 incidents, the subjects were shot in the leg in 13 incidents, in the arm in one incident, in the torso in five incidents, and in the head in two incidents. In three incidents, the officers missed their target. A total of four of the incidents had fatal outcomes.
Outcome—bystanders	There are no reported injuries of bystanders resulting from police use of firearms.
Outcome—police	In two of the 24 incidents, it is reported that a total of five police officers received gunshot wounds (resulting in three minor injuries and two severe injuries).

1. Firearms includes live firearms, soft guns, replicas, and items perceived to be a firearm.
2. Actions where the subject advances against someone with a stabbing, chopping or striking weapon in hand or directs a firearm or fires shots against someone.

The main findings presented in Table 1 show that in the vast majority of armed confrontations, Norwegian police officers attempted less coercive measures unsuccessfully before making use of firearms. When shots were fired, the officers were close to the subject, which is common when an attack is being carried out. The police officers fired one or a few shots, which regularly hit the subject's limbs (e.g. the legs). In the vast majority of situations, the subjects were physically injured but not the police officers. A few of the cases will be presented in more detail in Section 4.2.

4.2 Interviews

The interviewees' ranking of how similar they found the incident to their previous operational training and professional experience, showed that operational training received a mean score of 8, whereas professional experience received a mean score of 4. All the interviewees related varying degrees of recognition regarding the overall incident or parts of the situation. All had received acute assignments assigned by the operations centre, been required to perform an emergency response at a scene, and had experienced a confrontation with an armed subject. The descriptions of the confrontations were more detailed, with the interviewees providing information about their assessments, attempts to stop the subject and the perceived threat. The interviewees also explained their understanding of the situation, their attempts to set limits for the subject, the physical and psychological impacts on themselves and what specifically triggered their decision to fire.

Based on the findings in this study, we divide acute armed assignments into four phases: (1) receiving the assignment; (2) mobilization and deployment; (3) confrontation, and (4) decision-making on the use of firearms. The following presentation of findings is structured accordingly.

4.2.1 The assignment

All the interviewees were either given their assignments by the operations centre over the radio or became aware of the incident themselves over the radio or PC. The majority of the interviewees described being given limited information, typically being informed that there was an armed subject, a threat or an act of violence, and being given a location. One of the interviewees stated that the assignment received from the operations centre was to drive to a location in the city where a subject was shouting, screaming and waving a weapon. Another interviewee specifically referred to the limited information that was received from the operations centre; commenting: "*Then there was a message on the radio about ¼ a man who had been threatened with a big weapon ¼ it was really all we got to know ¼ .*"

Based on the information received, the interviewees recounted mixed expectations of their assignments. Half of the interviewees perceived the assignment as serious and understood that they needed to respond quickly. A few of the interviewees did not initially expect that the assignment would develop into a severe situation. One of the interviewees specifically stated that there was nothing extraordinary about the assignment to which they were assigned because the interviewee had been on many similar ones and noted that they (the police) frequently confiscated weapons in the city centre and amongst drug addicts, based on similar assignments.

4.2.2 Emergency deployment

All the interviewees referred to acute assignments. For a few interviewees, the response time was only a few minutes, but many interviewees had longer travel times to the assignment or else did not specifically refer to their response time. The majority of the interviewees emphasized that there was a great deal of activity on the radio during their emergency response, in terms of information and co-ordination with other patrols. The majority indicated that their main focuses were locating the scene, locating the subject and loading their firearms. One of the interviewees recounted that during an emergency deployment: "*You immediately think to get to the place, first and foremost, and see if we can locate the subject in the area and see if there is anyone on the ground, has the subject attacked anyone, don't know what it's about ¼*"

Another interviewee said that the police on-scene commander was not present at the scene and that their patrol was therefore responsible for co-ordinating with other patrols

when it was the first to arrive at the scene. The interviewee stated that there was very little discussion within the patrol regarding the assignment to which they were heading. Generally, those interviewees who had longer response times related more about preparation for the incident, such as distributing tasks and other preparations amongst the officers.

4.2.3 Recognition

All the interviewees considered that the incident, or parts of it, was recognizable from previous training. Their sense of recognition was based upon elements such as similar information, such as a subject advancing with a weapon, the subject failing to comply and the police officer needing to be aware of distances. The interviewees may have conducted a similar role-play with instructors. One of the interviewees stated that his training provided him with tools that were useful in real-life situations. He recounted that he had made memories and images in his head that gave him the experience of having done this before and, thus, the real-life situation did not feel completely unknown. However, the interviewees felt that their experiences in service did not make the incidents as recognizable as their training did. One interviewee recounted a specific experience of recognizing the situation based on training rather than experience: *"Compared to training I think it was quite recognizable ¼ [Based on my] own experience, I have never experienced that someone has come after me with a weapon ¼ I have never experienced that before."*

Most of the interviewees had professional experience that resulted in recognition of parts of the incident in which they were involved. These elements included similar information to the assignment, having experienced confrontations before or having threatened someone with firearms. However, half of the interviewees pointed out that there were parts of the situation of which they had no previous experience, either from training or professional experience. These were contextual elements, such as pepper spray not having any effect or situations where threats with a weapon were directed against a bystander, or where the subject had been unexpectedly mobile.

4.2.4 Confrontations

The data provide descriptions of partially different situations, from the more stagnant situations involving communication between the police and the subject to more dynamic contexts in which the police had to pursue the subject over longer distances. Many interviewees recounted their assessments during a confrontation and stated that particular considerations were how they could stop the subject and avoid losing sight of the subject. One of the interviewees commented: *"It is my assessment that we must stop the subject relatively quickly."* A few interviewees pointed out that situations were uncomfortable because bystanders were present and that, on some occasions, they could not fire because of unsecure surroundings or because bystanders were behind the subject. One of the interviewees said that they shouted to bystanders to get away, but that the bystanders did not perceive the danger. The interviewee could not fire because bystanders were standing behind the subject and the interviewee therefore chose a physical confrontation with the subject to avoid a threat being directed at bystanders.

Most of the interviewees used less coercive measures during the confrontation with the subject before resorting to the use of firearms. Overall, it appears that verbal warnings, pepper spray, batons and warning shots were used to varying degrees in these situations. One of the interviewees stated that pepper spray, baton and a warning shot were used without being sufficient to stop the subject. Another interviewee related attempts to stop a subject: *"When the subject comes ¼ then I shout as loudly as I have never shouted before, it is threat-*

ened that weapons will be used if the subject does not comply." A few of the interviewees were unable to do more than indicate that they were police officers to the subject before the threat arose and firearms were used.

All the interviewees told of situations where the subject advanced against them with stabbing, chopping or striking weapons, or fired shots or directed firearms against them. A few interviewees recounted that a subject had first advanced towards bystanders with weapons in their hands, at which point the interviewees had shouted or sought a confrontation to stop the subject. One of the interviewees commented that: *"The subject walks downwards purposeful and is ¼ totally crazy. Yes, I'm sure the subject will probably attack someone."* Another interviewee noted that he had pursued a subject in the city centre and that the subject suddenly turned around with a weapon raised and advanced quickly on the interviewee.

4.2.5 Decision-making

All the interviewees related their understanding of probable outcomes and stated that they feared that the situation could have serious outcomes. One of the interviewees stated: *"I feel we are facing such an obvious threat that ¼ if there is not a shot fired now, this will end up much worse."* Most of the interviewees had an understanding that the subject would use weapons against or harm themselves or others. One of the interviewees elaborated on this, stating that because there was no doubt that the subject would attack any person it was an opportunity to assault (him). Contrary to the other interviewees who indicated that they had an understanding of what the subject would do to others, our last interviewee disclosed thinking that they (the police) might have to kill the subject as a result of the subject's actions.

Most of the interviewees indicated that they set limits in relation to how severe they could permit the threat to become before they would make use of firearms. The interviewees disclosed that they allowed the subject to go far beyond these limits before using firearms, and that the reasons for this were that they did not really want to shoot, or that the situation developed very fast or they had to wait for the right time to fire. One of the interviewees specifically recalled waiting to shoot: *"My limit is really over here¼ I don't shoot until the subject is far across my limit. But that's probably because ¼ you want to avoid firing to the very end."* Another of the interviewees stated that there are consequences to firing real shots against humans, and that these consequences are apparent consciously or unconsciously when one has weapons in one's hands. In the data material, a few of the interviewees pointed out that it is easier to fire against someone in a training situation in which you do not hurt anyone, and noted that one holds fire much more in a real-life situation.

Most of the interviewees related varying degrees of physical and psychological impacts on themselves during or immediately after a confrontation. Our last interviewee stated that he did not experience any physical or physiological impact, but referred to experiencing the confrontation as lasting a long time, despite the police audio log from the incident showing that the confrontation was over in seconds. During the confrontations, the majority of the interviewees recounted various experiences and effects, including a clear focus on what was happening in front of them, processing many thoughts quickly, reduced hearing resulting in limited registration of the sound of the shot, and feeling as if time went slower than it actually did. In addition, they referred to experiencing an increased heart rate, adrenaline, and tunnel vision. One of the interviewees informed us that during the confrontation, the interviewee felt that some of his senses were reinforced, that everything was crystal clear, with a focus on details, and this interviewee also experienced his hearing disappearing when shots

were fired. Another interviewee described his experience in the following manner: *"I won't say I got tunnel vision, I got reduced hearing but a very clear sight and a very clear mind. I remember every thought I had there and then ¼ it really came down to shoot [or] don't shoot."*

A few of the interviewees disclosed that they experienced shivering immediately after the confrontation. Some related that they felt afraid and feared dying during the confrontation. They also told of fears of being injured and thoughts of their own families.

All the interviewees referred to the perceived threat to themselves or others as the cause of their decision to fire. The majority of the interviewees decided to shoot at a point of time when the subject directed firearms against them, or when the subject advanced towards them with a stabbing, chopping or striking weapon in their hands and the distance between them became short. One of the interviewees specifically told what made him fire on the subject: *"It was the distance, and the subject had his hand* [with a weapon] *raised above his head."* A few of the interviewees referred to their decisions to fire being based upon everything that had happened and vain attempts to prevent the situation escalating. One of the interviewees stated that it was the sum of everything that had happened that formed the basis for the decision to fire.

5 Discussion

How do Norwegian police officers make decisions on the use of firearms and which contextual factors influence these decisions? To answer this research problem, we divide our discussion into three subsections that consider, in turn, the context, the recognition and the decision-making.

5.1 Context

Context can be defined as "the situation within which something exists or happens, and that can help explain it" (Cambridge Dictionary, 2019). The context in which armed confrontations exist or occur have many of the defining characteristics of crises (e.g. Rosenthal et al., 2001), such as time pressure, risk, ill-structured problems, uncertainty, unpredictability, multiple and shifting goals, several individuals, stress and the need for critical decision-making. The findings in this study show that in nearly half of the incidents, it appears that the police officers had approximately one minute or less time from when confrontation with the subject occurred until shots were fired. Thus, an additional contextual factor of armed confrontations, which underlies critical decision-making in these contexts, is the speed of the situational development and termination, a typical characteristic of a fast-burning crisis ('t Hart & Boin, 2001). Furthermore, given that the police service in Norway is routinely unarmed, any situation in which the police arm themselves with firearms is already extraordinary. We define armed assignments as assignments that, based on the information provided, cause the police to arm themselves with firearms and thus, they have an inherent potential for firearms being used. The Norwegian police preparedness system distinguishes between planned and acute assignments, with planned assignments being known and planned before completion (Politiet.no, 2019c, p. 152). In contrast with planned assignments, all the interviewees in this study spoke of acute assignments characterized by limited information, restricted or no time for planning and time pressure in terms of emergency response. Based on these contextual characteristics, it is fair to say that, in the early phase, the subjects have taken the initiative, decided the context and ultimately determine the first police response. The development of such potentially critical incidents is not self-

evident, and the police must make sense of them (Boin et al., 2005) and develop plausible images that rationalize what people are doing (Weick et al., 2005). In the initial phase of the assignment, the police officers received limited information to guide their initial planning. This limited information is the foundation for their sense-making upon arrival at the scene of the incident. However, the findings in this study indicate that police officers, in the early phases of incidents, have different expectations when making sense of the acute armed assignments. Whereas half of the interviewees perceived the assignment as serious and requiring a quick response, other interviewees did not initially expect the assignment to develop into a severe situation. For example, one of the interviewees specifically stated that there was nothing special about the assignment because the interviewee had been on many similar ones. However, the main initial task for the interviewees when arriving at the scene of the incident was to gain an overview of the situation and situational awareness through the elements in the environment, to comprehend their meaning and to project their status in the near future (Endsley, 1995). Arriving at the scene of the incident, all interviewees experienced a confrontation with an armed subject, ranging from dynamic pursuit to stagnant situations with some kind of communication between the parties, after which all interviewees feared that the situation would result in severe outcomes. Thus, a marked distinction during the assignment is the shift from initial mixed expectations to unequivocal fear of serious consequences of the situation after confronting the subject. This suggests that it is situational cues in the present context of armed confrontations, and not the initial information, that predominantly forms the basis for police officers' situational awareness and decision-making.

5.2 Recognition

Recognition can be defined as the "knowledge or feeling that someone or something present has been encountered before" (Merriam-Webster, n.d.). Recognition represents a key factor in the recognition-primed decision-making model, in which elements of the present context are recognized as similar to previous experiences, and this recognition supports development of a course of action that has been effective in prior situations (Klein, 1998; Lintern, 2010). During 2016 (up to November), Norwegian police handled 786,686 assignments, of which 5,816 were armed assignments (Politiet.no, 2019a) and they discharged their firearms against a person in two assignments (approximately 0.034 % of the armed assignments). During the period 2002–2014, on average, there were 62 cases per year in which police threatened to make use of firearms but did not discharge their weapons (Politiet.no, 2019b). Because police use firearms so infrequently, it is difficult to determine when an officer can be regarded as experienced in this matter (Mitchell & Flin, 2007). Given these numbers, it is reasonable to argue that Norwegian police officers' recognition of armed assignments is likely to be based on situations involving no confrontation or de-escalation. Thus, a challenge is to distinguish between statistics and previous experiences, and the context of the current assignment. Training and professional experience can form an experience base that is acquired independently of the present context, and police officers may draw upon these experiences when recognizing them as similar to the situation at hand. In this study, all interviewees found the incident very recognizable based on their previous training, but less so based on their real-life experiences. This suggests that in-service training provides a better experience base for promoting recognition of armed confrontations than do the situations that officers experience during their service. Furthermore, particularly given the rare nature of incidents in which firearms were discharged, it was anticipated that the context of the studied armed confrontations posed specific elements. Half of

the interviewees described contextual elements of which they had no previous experience; for example, less lethal options not having any effect. All descriptions of these experienced anomalies related to the subjects' actions, suggesting that it was less possible for interviewees to draw on recognition from previous experience of armed assignments involving handling an armed subject.

5.3 Decision-making

When confronted by potentially critical situations such as armed confrontations, police emergency response officers must perform decision-making of the utmost importance. An important factor underlying this critical decision-making is how the contexts of armed confrontations can affect the officers. In this study, most of the interviewees experienced various physical and psychological effects, for example, an increased heart rate and tunnel vision, and one interviewee related that his hearing disappeared when shots were fired. This suggests that these contexts involve stressful conditions that underlie the officer's decision-making, and that the officers perceive armed confrontations as critical situations. It is reasonable to compare such critical situations with crises, defined as "a serious threat to the basic structure or the fundamental values and norms of a system, which under time pressure and highly uncertain circumstances necessitates making critical decisions" (Rosenthal et al., 1989, p. 10). Critical situations call for critical decision-making and individuals can use intuitive or analytical approaches when deciding how to act (Helsloot & Ruitenberg, 2004). As noted earlier, Kahneman (2011) refers to intuitive reasoning as system 1 thinking, which is fast, effortless and involuntary, and describes intuition as the use of experience without deliberately thinking things out. In contrast, analytical reasoning forms the deliberate activities of system 2, which are controlled, voluntary and effortful and place demands on limited attentional resources (Kahneman & Klein, 2009, p. 519). Thus, analytical or system 2 reasoning is more likely to be disrupted if attention is disturbed (Kahneman, 2011), as is likely to occur in a dynamic armed confrontation. A police officer's response to such an unfolding armed confrontation combines training, professional experience and subjective assessments of the imminent threat (Burrows, 2007, p. 277).

Furthermore, several studies have shown that an important factor influencing police officers' use of firearms is the policies of the police agency (Jennings & Rubado, 2017; White, 2001). The Norwegian Firearms Instructions direct police officers, if the situation permits, to attempt less coercive measures before firearms are used and as far as possible, to avoid harm to bystanders (Myhrer, 2016). Initiation of an attack or violent actions is not required for the use of firearms to occur. It is sufficient that there is a real possibility that a threat may materialize in the form of such actions and the probability of this threat must be judged specifically in the actual situation (Myhrer, 2005). The legal framework provides guidance for vital assessments and analytical decisions and, at the same time, allows for faster and more intuitive decision-making if necessary. The formulations of the instructions allow for the use of judgement and discretion in the context. Thus, the decisions of the individual police officer become more important. Adequate response in armed confrontations depends on critical decision-making at the right moment of time, to maintain or regain police initiative and control of the situation. Based on the data used for this study, it appears that most of the interviewees attempted unsuccessfully to restrain the subject using less coercive measures (e.g. pepper spray) before resorting to the use of firearms. A few of the interviewees held their fire on some occasions during the confrontation if their surroundings were not sufficiently secure, in that bystanders were present who could have been injured. Thus, it is fair to say that these interviewees somehow performed conscious and

controlled assessments during the confrontation, which are the defining characteristics of analytical reasoning forming the deliberative activities of system 2 thinking (Kahneman & Klein, 2009). These findings suggest that the interviewees made use of analytical reasoning during the confrontation, which is further substantiated by the informants' own descriptions of their assessments during the confrontation, especially their descriptions of considering how they could manage to stop the subject.

Based on the Decisions of Prosecutions by the NBIPA, it was anticipated that police officers were relatively cautious in making use of their firearms. In this study, most of the interviewees referred to setting limits on how severe they would allow the threat to become before they would make use of their firearms. In fact, however, the subjects crossed these limits before firearms were used for various reasons. One interviewee specifically elaborated on this and said that he wanted to avoid firing to the very end, thus, the subject was let far across the interviewee's limits. The median distance between the subjects and the interviewees was 5 metres when shots were fired, which underpins the interviewees' descriptions that they allowed the subjects to get very close to them before discharging their firearms. In this context, a key question is how close is *too* close? In a subsequent legal assessment of the police use of firearms, the Norwegian Director of Public Prosecution referred to definitions of other specialists, such as the Norwegian naval special forces. They consider an attack with a knife within a radius of 6–8 metres as deadly. The Swedish police's dignitary protection considers this distance to be 10 metres (Riksadvokaten.no, 2019). Thus, it is fair to say that the interviewees may have been in imminent danger. When asked exactly why they made the decision to fire, all the interviewees referred to the perceived threat to themselves or to bystanders. Most of the interviewees made the decision to fire at a point of time when the subject directed firearms against them, or advanced against them with weapons (e.g. a knife) in their hands and the distance became short. In their study of shooting decisions by police firearms officers (officers authorized to carry out armed assignments) in Scotland, Mitchell and Flin (2007) find that briefing information did not influence the officers' decisions to shoot, but the officers attended to the situational cues in the simulated scenarios and responded accordingly. These findings support this study, based on the interviewees' specific descriptions of the subjects' actions as the cause for their use of firearms. The subjects' actions and commonly short distances between the parties indicates a reactive response from the interviewees, in which the majority have made split-second decisions to fire in potentially life-threatening situations. Contrary to the more analytical decisions made earlier in the confrontation, these findings suggest that the critical decision to fire is predominantly swift, with severe time constraints limiting the possibility of deliberately assessing alternative courses of action. In addition, the findings in this study show that the interviewees experienced a high degree of recognition of the situation based on their previous training. These findings largely correspond to what Kahneman (2011) denotes as intuitive system 1 reasoning, which is fast, effortless thinking based on experience, without deliberately thinking things out. These findings suggest that the critical decision to fire is predominantly intuitive, made in the instant moment when officers rapidly respond to the perceived threat at close range. These decisions simultaneously represent an end of all the phases of an acute armed assignment (Section 4.1).

Figure 1 displays experiences in terms of previous training and professional experience as contextually independent factors that support police officers' decision-making. It also displays the context-dependent factors, information and situational awareness, that underlie police officers' decision-making on the use of firearms in the specific situation.

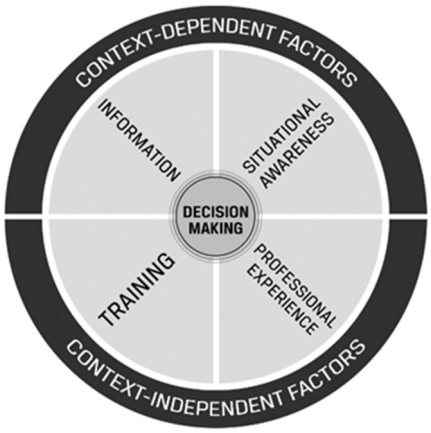

Figure 1 Context-dependent and context-independent factors inflicting decision-making.

6 Conclusions

Norwegian police emergency response officers draw upon recognition, primarily from training experience, when handling armed confrontations. The officers use a combination of analytical and intuitive decision-making during these confrontations, and the split-second decisions to make use of firearms are primarily intuitive, based on swift decisions when officers find themselves in imminent danger. The basis for these decisions is that of situational cues to which the officers respond accordingly. Key contextual factors are stressful conditions and commonly short distances between the police officer and the subject when shots are fired. The presence of bystanders, creating unsecure surroundings, may also hinder police use of firearms.

A key finding in this study is that Norwegian police officers frequently hold their fire until a threatening situation has materialized into an attack, and they find themselves in imminent danger. In some situations, the police avoid using firearms until a critical point of time, resulting in time-critical decisions at the expense of more analytical reasoning, which may have occurred in a possibly more controlled situation at a somewhat earlier stage. More research is needed to improve our understanding of these decision-making processes. It would be of interest to study situations in which, in contrast to those in this study, police have had legal permission to discharge their firearms (police officers' subjective experiences) but chose not to do so. Identification of these factors may contribute to enhancing the decision-making process, when balancing situations involving a fine line between the use of necessary and excessive force during armed confrontations.

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