Identifying the Necessary Components of a Police Decision-Making Model

by

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Abstract

As police officers are entrusted with significant amounts of discretion and power in instances potentially involving arrest, use of force, search, and seizure, their decisions have serious consequences. Yet, very little research has been conducted into police officer thinking and decision-making. The objective of this research was to identify the necessary components of a decision-making model which can be used to prepare police officers to appropriately exercise their discretion when dealing with ambiguous, time-pressured, and consequential situations. The research on critical thinking (CT) and decision-making in policing was reviewed and supplemented with research from related disciplines. Multiple decision-making models were identified, discussed, and compared. The recognition/metacognition (R/M) model developed by Cohen, Freeman, and Thompson (1998) was identified as potentially adaptable for use in policing.

As CT is considered best learned in domain specific environments, the police context for decision-making must be explored. A multimethod study was designed and conducted. Frontline police officers were the focus as they are particularly impacted by time, access to information, and stress effects. Responses to Critical Incident Analysis Interviews were combined with findings from the literature, to prepare a questionnaire. Canadian police services were contacted and invited to participate in a survey of frontline police decision-making. The services which agreed to participate forwarded the invitation to frontline police personnel. Respondents provided their information through an online survey. The sampling was non-random, as self-selection occurred at the service and individual levels. The results indicated that a model of police decision-making should

include recognition and metacognition components taught through a domain specific approach. The five identified themes of: information, safety, planning, respite, and articulation should be used for scenario creation. A Recognition-CT Police Decision-Making Model is proposed.

The information collected was detailed and rich, but cannot be confidently stated to be representative of all Canadian police officers, and while having many strengths, qualitative studies can also be prone to researcher bias. Even with these caveats, this research provides important information to improve our understanding of the complex and ambiguous environment in which police decision-making occurs. Suggestions for future research on police decision-making and the role of CT are also discussed.

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CCTJ: Cognitive Continuum Theory of Judgment

CT: critical thinking

DFJDM: deadly force judgment and decision-making

EEG: Electroencephalography

EMT: Error management training

ICEHR: Interdisciplinary Committee on Ethics in Human Research

NACJD: National Archive of Criminal Justice Data

NDM: Naturalistic Decision Making

PTO: Police Training Officer

PBL: problem-based learning

R/M: recognition/metacognition

RCMP: Royal Canadian Mounted Police

RNC: Royal Newfoundland Constabulary

STEP: Story, Test, Evaluate, Plan

TADMUS: Tactical Decision Making Under Stress

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Chapter 1: Introduction

Police officers make many decisions every day. Some of these decisions are relatively routine and easy to make as there is much legislation and policy direction available to assist officers. However, legislation, police service policies, and standard operating procedures can only cover a portion of police officer decisions. These same documents also explicitly provide police officers with the power of discretion to bridge these gaps. For example, the *Criminal Code of Canada* (1985) states in many sections that a police officer "may" detain, arrest, search, or use force [e.g., Sections 83.3(4), 117.02(1), 117.04(2), 184, 199(2), 254, 462(2), 487.012, 487.11, 495, 496, 499, 503, 529.3, 672.91]. Although some parameters are provided, there is still room for discretion. Terms such as "reasonable" leave the interpretation of the information and the decision to the officer. Officers need to provide justification after the fact, but during the event they are usually on their own, and quite often without ready access to the guidance of a supervisor (McKenna, 2002). Such a situation results in individual officers being entrusted with significant amounts of discretion and power. Many police decisions carry potentially serious consequences as they involve, for instance, arrest, use of force, search, and seizure.

There are currently no training models for the instruction of discretion in policing and the skill is usually developed through experience (Griffiths, 2008). Some *ad hoc* discretion training occurs during the recruit probationary period while novice officers are paired with experienced constables. However according to Griffiths, this time period is

usually only two to ten weeks in length and is determined more by availability of opportunities than by training principles.

Not all police decisions are correct. News media report incidents where the decisions of one or more police officers are questioned. For example, the death of Robert Dziekanski at Vancouver International Airport on October 14, 2007 (Braidwood, 2009) was a vivid example that directed attention to police decision-making. Four officers of the Royal Canadian Mounted Police (RCMP) responded to a call of an intoxicated male throwing around luggage at the airport. While driving to the airport terminal the officers were told over the radio that the person was now throwing chairs through glass windows. On arrival, bystanders directed the officers to Mr. Dziekanski who was inside the secure international arrivals area, surrounded by intact glass walls. The officers positioned themselves in a semicircle in front of the distraught and frightened new arrival to Canada and attempted to communicate with him. Mr. Dziekanski did not speak either of Canada's two official languages. Mr. Dziekanski picked up a stapler from a desk. Interpretation of the threat posed by the presence of a stapler as a potential weapon, paired with arm and forward body movements of Mr. Dziekanski led the officers to label the behaviour as proceeding from resistant to combative and all testified that deployment of a conducted energy weapon (brand name Taser) was within the RCMP use of force training recommendations for such a situation. The officers made several decisions in a short period. Within 26 seconds of engaging Mr. Dziekanski, one of the officers deployed a Taser multiple times. The result was that Mr. Dziekanski died at the scene.

The officers were initially influenced by the information they received from dispatch and the update en route. They did not appear to reassess the situation upon arrival when new information was available. The information on view did not match the information they had been provided. Commissioner Braidwood did not mince words about the decisions taken by the police officers. He criticized the officers for not carrying out an appropriate reassessment of risk before deploying the Taser. He stated, "They approached the incident as though responding to a barroom brawl and failed to shift gears when they realized that they were dealing with an obviously distraught traveller" (p. 11). He also criticized the RCMP policy and training for fostering such poor decision-making.

The discretion to choose which type of force to use and when was at issue. Mr. Dziekanski was located within a secure area and was not currently posing a threat to any members of the public. The officers chose to stand relatively close to him even though more space was available in the lounge area. The officers could have chosen to slow down the situation, contain Mr. Dziekanski, acquire more information from the airport staff, and send for an interpreter. De-escalation could have been the goal to allow more time for decisions to occur. Once the Taser was deployed there were further decisions by the deploying officer to repeat the cycle of electric current more times than recommended by RCMP policy. The incident was particularly egregious. Much time and resources were invested to determine why it happened. Four police officers made several decisions within two minutes, and it took months of testimony and millions of taxpayer dollars to review.

If these in-the-moment police decisions were the only type in need of review, the task would be somewhat easier. The literature on quick decisions under stress would be all that needed reviewing. However, a consideration of the full spectrum of decision-making, up to and including analytical decisions made during investigations is required, along with the role of critical thinking (CT). For example, the Lamer (2006) Inquiry into the wrongful convictions of three men in Newfoundland and Labrador questioned the decisions of investigators at several stages of two of the initial investigations. The Royal Newfoundland Constabulary (RNC, 2005), in a report to the Inquiry, included a section on contrarian thinking that was inspired in part by a recommendation from the Morin Inquiry (Commission on Proceedings Involving Guy Paul Morin & Kaufman, 1998). Commissioner Kaufman recommended that forensic scientists, like all other scientists, should work vigorously to challenge or disprove the working hypothesis, instead of working to prove it (i.e., avoid tunnel vision). The RNC suggested extending this aspect of the scientific method to criminal investigations, so as to avoid groupthink. They suggested appointing a strong devil's advocate or requiring all members to share the role, but suggested replacing the negative term of devil's advocate with the term truth advocate. They also stressed that group leaders must be interested in hearing all contrarian views beginning early in the process so that the work and any resulting hypotheses are strongly scrutinized. Commissioner Lamer (2006) in responding to the RNC report praised the contrarian view approach. He also felt that the absence of such a role was the fatal flaw in one of the investigations.

Findings and information from these inquiries and other incidents need to be compared to theories and research to enable improvements in police decision-making. Some authors have begun this process. For example, Rossmo (2009) discusses faulty investigative thinking and reviews several traps to which investigators fall prey. Under cognitive biases he highlights the limitations on human perception and memory and the effect of biases. He recognizes the need within policing for both intuitive and rational decision-making, depending on the uncertainty and complexity of the situation, the amount of time, and the quantity and quality of information available. Under organizational traps he defines groupthink as a reluctance to think critically and the perseverance of a dominant theory because it is not challenged by anyone within the group. Selective information gathering and an insular, non-challenging approach lead to poor decisions (FPT Heads of Prosecutions Committee Working Group, 2004; Janis, 1973; Rossmo, 2016).

The need for police officers to make good decisions is also becoming increasingly important to themselves as professionals. Beyond the ethical responsibility to do a good job, there have been recent changes in accountability that threaten the ability of officers to continue in their professions if they are not good decision makers. *R. v. McNeil* (2009) is Canadian case law that requires the police to disclose to the Crown, and then on to the defence, records of discipline and misconduct of officers involved in criminal proceedings. Officers' credibility may be called into question and thus their ability to testify at trial may be compromised. Testifying is a prime requirement of policing, thus it may impede their effectiveness and jeopardize their employment.

Police officers are invested with significant powers of discretion with little immediate supervision and a lack of training in how to use that discretion in decision-making. Examples of police errors are readily available in the media, and reviews/inquiries to understand and prevent similar errors in the future are costly and time consuming. The spectrum of police decision-making is vast as it runs from individual quick decisions to lengthy detailed group investigations. Accountability is important, but prevention is preferable. The objective of this research is to identify the necessary components of a decision-making model which can be used to prepare police officers to appropriately exercise their discretion when dealing with ambiguous, time-pressured, and consequential situations. To achieve this objective a step-wise multimethod approach is utilized. Interviews with and a survey of frontline police officers provide context to identify the necessary components and to develop and propose a model of police decision-making. The first step in identifying these components is to review relevant literature.

Chapter 2: Literature Review

As policing does not have a vast depth of its own theories and research, an interdisciplinary look across various fields of study can be useful in identifying promising approaches. Several theories and approaches will be reviewed and compared to see what each may contribute to identifying the necessary components for an applied model of police decision-making. To begin, a look at CT may be helpful, as it is one approach to decision-making, is interdisciplinary, and has been applied in many fields.

2.1 Definitions of Critical Thinking

Multiple reviews of the empirical literature on CT concluded that there is no consensus on a definition (e.g., Baker, Baker, & Lestansky, 1996; Champion, 1995; Dean, 2006). Some authors have approached the issue from the perspective of what it is not. For example, Stanovich and West (2008) in three experiments on biased thinking with 1,308 undergraduate students found that there was no relationship between cognitive ability and biases, thus reasoning that intelligence was rather independent of CT. Some authors describe limits. For example, Renaud and Murray (2008) randomly assigned 190 first-year undergraduate psychology students to two groups. One group was given higher order CT psychology review questions, while the other group was given lower order psychology recall questions. The pretest to post-test comparisons showed improvements in CT for both groups on general and subject-specific questions, but larger gains were noted in the subject-specific measures for the students given the higher order CT review questions, thus providing support for the contextual view that effects on CT would be more pronounced within topics than across general measures.

This lack of an agreed definition led the American Philosophical Association to initiate a process to achieve consensus on a definition, at least for the purposes of educational assessment and instruction (Facione, 1990). The resulting definition is cumbersome, but helpful in demonstrating the breadth of the concept.

> We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. CT is essential as a tool of inquiry. As such, CT is a liberating force in education and a powerful resource in one's personal and civic life. While not synonymous with good thinking, CT is a pervasive and self-rectifying human phenomenon. The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit. Thus, educating good critical thinkers means working toward this ideal. It combines developing CT skills with nurturing those dispositions which consistently yield useful insights and which are the basis of a rational and democratic society. (p. 2)

Facione (2015), in his frequently updated and much cited "Critical Thinking: What it is and Why it Counts" represents the interactions of the core critical thinking skills with the following diagram.

Figure 2.1: *Core Critical Thinking Skills*

Facione's (2015) diagram features the five cognitive skills identified by the

American Philosophical Association experts (Facione, 1990): interpretation, analysis,

evaluation, inference, and explanation, plus a sixth cognitive skill, self-regulation, which

was identified by the experts as a necessary descriptor for the type of judgment that

defines critical thinking. The circle surrounded by the skills represents the view that

critical thinkers must have more than just skills, they must also have the necessary

disposition to use those skills. Facione (2015) picks up on the need for purposeful

judgment identified by the experts, and adds an emphasis on that process being constantly

reflective. Dispositions are generally defined as inherent qualities, so unlike the skills

listed above, a person's disposition is more influenced by their character than by what

they are taught. The recommended approach then is to cultivate the necessary dispositions

while teaching the identified skills.

The next question is, does this CT definition relate to policing? The above

description of the ideal critical thinker contains attributes that would be beneficial to

police officers and the communities they serve. Commissioners Braidwood (2009) and Lamer (2006) each highlighted the need for several of these qualities. They referred throughout their reports to many interpretations, inferences, evaluations, explanations, and analyses offered by those who testified at these Inquiries. Both commissioners also criticized areas where these skills were not adequate. Commissioner Braidwood states that the public is entitled to expect officers to "apply care and professional judgement" in recording their recollections (p. 243). He goes on to criticize the "blinkered" approach by the responding officers and by the use of force expert (pp. 250-251), citing the lack of an "appropriate reassessment of risk" (p. 250) and the failure to take into consideration the emotional state of Mr. Dziekanski, even though this is included in the RCMP's intervention model. Commissioner Lamer refers to the critical thinking expected to occur as a result of the shared responsibility of the major case management model's co-ordinator, analyst, and lead investigator roles (p. 103). He also refers to the need for critical assessment, analysis, and good judgment by investigators and Crown Attorneys.

The American Philosophical Association definition also recognizes that circumstances and the subject may limit the precision of results, thus recognizing the real-world context of policing and other related professions. Cohen, Freeman, and Thompson (1998) define CT as follows:

> Critical thinking includes the ability to sort out what is truly important, to address conflicts in the information that is available, to ferret out and refine the assumptions required to interpret the information, and to manage time wisely so that action is taken in a timely manner. (p. 188)

Given what has been learned from reviewing the above information on the police role and the environment in which it occurs, this appears to be an acceptable operational

definition for policing. The identified constraints are highly relevant to the police context. These constraints will be explored in more detail throughout the remainder of this paper. Before moving on to some of those issues, an important question must be addressed. That is, do police officers, and the educational and training institutions preparing police officers, accept CT as a requirement of police decision-making?

2.2 Acceptance of Critical Thinking within Policing

The policing profession has expressed a growing interest in CT and its role in decision-making (Champion, 1995). That interest has grown into acceptance and use by some. For example, "The Case for Critical Thinking" (2008) describes the efforts of the Association of Chief Police Officers in Scotland to develop a behavioural tool to screen candidates during the selection process. It is designed to screen out candidates with unwanted biases, such as racism. Self-regulation is an important aspect of critical thinking. The tool requires candidates for police positions to show an ability to think critically about various scenarios and provide answers that do not allow the included pictorial race cues (such as skin colour) to bias their reactions. The test was developed by the clinical psychology department at Strathclyde University (Howie, 2005). Measures of sexism and attitudes to risk-taking are also included. The Scottish Police College (n.d.) recruitment assessment centre includes the test. The test uses police-based scenarios, but is not a test of prior police knowledge.

In Canada, various police service websites include references to CT (e.g., Abbottsford Police, n.d.; Moose Jaw Police Service, n.d.; Royal Canadian Mounted Police, n.d.a). For instance, the RCMP duties state, "While many police duties are routine

in nature, there may be times when you must perform duties that are non-routine and perhaps dangerous. These situations require flexible and critical thinking skills" (Duties).

The American Occupational Network database, O*NET (n.d.), provides descriptions of occupations, including information on: tasks, knowledge, skills, abilities, education, and employment trends. Included in the list of skills for the police patrol officer is CT, which they define as, "Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems" (Skills). Police career descriptions on various advice websites include CT as being an important skill for policing (How to become a better police officer, n.d.; Kane, n.d.; Latshaw, n.d.). Richardson (2007), reporting on recruiting issues in the United States, indicated that there is a need for police agencies to "go beyond the blue-collar-job pitch and frame the profession as one that relies on critical thinking and problem solving" (para. 3).

Educational institutions across North America and the UK also provide guidance to prospective and current police officers on improving their CT (e.g., Daymar Institute, n.d.; Ontario Ministry of Training, Colleges & Universities, 1999; Thompson Rivers University, n.d.). Partnerships between educational institutions and police services are developing and the improvement of CT is among the aims. For example, The University of Northampton (n.d.), in partnership with the Northamptonshire Police, provides a program in Police and Criminal Justice Studies. The program, "combines practical ability with critical thinking and decision making underpinned by a robust and challenging academic understanding" (Course content). The Faculty of Arts (since renamed to Humanities and Social Sciences) at Memorial University (2009) offers a Diploma for

RNC recruits and a degree major in Police Studies. The description for the major states the "program is intended to promote critical thinking about social issues to those working in a policing environment" (Section 8.26 Police Studies). Other partnership programs also report success with merging theory and application (e.g., Jacobsen n.d.; Stansfield & Trovato, n.d.). While these examples are indicative of successes, Cervero's (2001) warning that the barrier resulting from the ongoing "struggle for turf versus collaborative relationships" (p. 16) in continuing education must not be forgotten (also see Mahony & Prenzler, 1996).

Sometimes the support for CT comes from professionals and academics working with police services in varying capacities. Vickers (2000), for example, used experience as a consultant to explore police management education and research. The increasing complexity in policing requires changes in approach: "These changes warrant an intellectual curiosity, analytical ability and capacity to interpret social, political and historical contexts" (p. 507). Ideally, police officers "should be regarded as critical thinkers recognizing and responding to contextual complexity, ambiguity and change" (p. 511).

Avery (2007) also encourages steps toward CT and a departure from commonly used subjective terms like good judgment and common sense. He proposes a tactical decision-making equation which incorporates CT: "Risk vs. Need ÷ Time + Resources Available = Decision" (para. 9). The equation encourages officers to consider risk and need in relation to the amount of time and resources available. He believes that good experienced officers use this approach subconsciously, but emphasizes the need to train

officers to use the equation under duress: "Immediate action drills are great when you are surprised and need to survive the first moments of a crisis. But nothing beats critical thinking skills in the moment for superior performance" (final para.). Avery asserts that his formula can help in teaching CT, help police officers with their decisions, and guide them afterwards when they need to articulate and justify their decisions and actions.

It does not appear, however, that police training institutions have fully adopted the adult centred approaches required for CT. Bradford and Pynes (1999) surveyed all US states on details of their police academy training curriculum. Thirty responses were received and 22 of these included enough detail for analysis. The hours of training were totaled and categorised as either task oriented (defined as instructing "basic repetitive skills and conditioned responses" p. 288) or cognitive (defined as focusing on "an awareness of the process that establishes correct and valid thinking patterns" p. 288) training. The findings were that less than 3% of the time was cognitive training. There was only one exception noted, and that agency had completely revised its curriculum two years before the study was conducted.

Birzer (2003), citing the behavioral and militaristic approaches of many police training programs, suggested it is necessary to apply the theory of andragogy to police training. In support of that goal he provided an "andragogical guide" for those teaching criminal justice (Birzer, 2004). Progress in that direction, however, appears to be very slow. While no one has replicated the widespread survey conducted by Bradford and Pynes (1999), various smaller studies have noted that the militaristic environment is still the most prevalent approach. McCoy (2006) surveyed ($N = 85$) and then conducted

interviews with a purposive sample ($N = 21$) of police instructors from one state's Police Officer Standards and Training organization. The survey included demographic data and the Principles of Adult Learning Scale, which is a self-administered measure of individual teaching styles, wherein respondents report how frequently they practice 44 teaching behaviours. The results indicated very strong support for a teacher-centered approach. Analysis of the interviews indicated that lecture was the principal method of instruction, even though they did not believe it was the most effective method and would prefer a more hands-on approach. However, they felt limited by lack of teacher preparation and system constraints.

Werth (2009) conducted an exploratory study of students' perceptions of a problem-based learning (PBL) exercise added to a police training academy. Three academy sessions were surveyed and results were collected from 122 students. There was significant agreement ($p < 0.001$) reported by the students that the pilot program achieved the goals of teaching some of the more difficult to teach and measure skills. Werth suggested this addition of an integrated module approach, instead of a wholesale change of the curriculum, may provide a more accessible means of reaching the goals necessary for preparing officers for newer policing models.

Conti (2009) provided ethnographic information of an obedience to authority approach in one recruit training class at one police academy. Chappell and Lanza-Kaduce (2010) provided information from an observational study of recruit training at one police academy that despite a redesigned curriculum to teach community policing, the paramilitary structure and culture are still being reinforced. Cordner and Shain (2011) in

their editorial introducing a journal issue dedicated to the changes in police education and training highlighted the progress, but also went on to discuss the findings of the included articles which show there is a lot more room for change.

Oliva and Compton (2010) reported findings from a convenience sample focus group ($N = 12$) and individual interviews ($N = 8$) with police officers who had undergone training at a law enforcement training facility which show that adult education practice is preferred by students, but that this environment is not often achieved in police training. Mugford, Corey, and Bennell (2013) provided information toward opening discussions between researchers, designers, and trainers regarding general principles of adult learning and cognitive load more specifically.

The Council of Canadian Academies (2014) in their expert panel report, *Policing Canada in the 21st century: New policing for new challenges*, suggested the need for a change in focus away from exclusive in-house police classroom training to partnerships with higher education for practice-based learning. Taken in cumulative, these studies and reviews point to some, but limited, progress in the adoption of adult learning principles and techniques in police education and training.

Bradford and Pynes (1999) and later Werth (2009) highlighted PBL as one way to teach and retain necessary cognitive skills. Literature on adult experiential learning is supportive of this approach (e.g., Merriam, Cafarella, & Baumgartner, 2007). Hundersmarck (2009) furthers this support by discussing the need for police academies to move beyond the behaviourist style of learning where an expert provides information to students via lectures and then leaves it to the students to transfer that learning to the field.

He sees the strict reliance on lectures as an ineffective model, and points to PBL as a preferred model. He promotes a focus on encouraging CT using PBL techniques which are more reflective of the complex nature of police work. He points to the Police Training Officer (PTO) program developed in 2003 by the American Office of Community Oriented Policing as incorporating contemporary methods in adult education, including PBL. New adult education approaches in the field training of recruits are at odds with the predominantly didactic methods seen in most police academy classes. He believes transfer of learning from the academy to the field will be improved by adopting learner-centred, constructivist approaches across learning opportunities.

The Police Society for Problem Based Learning (n.d.) echoes Hundersmarck's (2009) call. Two of their mission statements directly reference CT: "To introduce modern educational methods to promote the values of problem-solving, critical thinking and ethical decision-making in law enforcement culture" and "To develop and sustain critical thinking and problem-solving skills through the Police Training Officer (PTO) program" (Mission). As another example of police associations supporting CT, the International Association of Chiefs of Police (2008) self-assessment course in police officer ethics includes a module on decision-making followed by an application module where students process case studies designed to engage them in CT.

Other educators also support the use of CT in police education and training. Baker et al. (1996) use CT concepts in teaching a criminal investigation course. They highlight the need for active learning approaches, case studies, simulations, and follow-up critiques. Kim (2014), using the constructivist learning theory literature as a base,

provides recommendations for criminology and criminal justice instructors new to PBL. Dean (2006) states that, "one of the essential learning shifts that must take place in order for police practitioners to make the transition from a 'training' mindset to an 'educational' perspective is the development of critical thinking skills" (p. 1). He recognizes that a "particular roadblock that police have to a greater extent than other types of students is that the very nature of the training they undertake to become a police officer is so 'procedurally' bound" (p. 12). He recognizes that this training method discourages critical and autonomous thinking in favour of just following the set procedures. Many situations can be successfully dealt with by knowledge of these guidelines, but some situations will be novel and the responses will need to be equally novel. Dean refers to the need to harness the different strengths of training and education to access "the transformative power of learning" (p. 14).

Although it is external to policing and not developed with policing in mind, Mezirow's (1997) work on transformative learning fits well with the approach advocated and taken by these police educators and trainers. Mezirow states that facilitating understanding of the meaning of our experiences is the goal of adult education. Members of contemporary societies must make our own interpretations instead of relying on the views of others. Autonomous thinking is developed through transformative learning. Mezirow (1997) further states: "Thinking as an autonomous and responsible agent is essential for full citizenship in democracy and for moral decision making in situations of rapid change. The identified learning needs of the workforce implicitly recognize the centrality of autonomous learning" (p. 7). Payne, Bettman, and Johnson (1993) add to

this concept and remind us that professionals need to be adaptive in deciding how to decide.

There is a growing interest, acceptance, and use of CT by police services, associations, and consultants in the recruitment, education, and training of police officers. There is also a concerted effort to increase the use of CT and education methods designed to enhance CT, such as PBL. Police officers have many duties that are procedurally bound, but novel situations not covered by these procedures are frequent occurrences. Police officers must be autonomous thinkers who can adapt to the situations in which they find themselves. They must be provided with transformative learning experiences to become adaptive decision-makers.

2.3 Research within Policing

As we see from the previous section, many members of the policing profession, educators, trainers, and consultants are embracing and extolling the benefits of CT for policing. So, the next question is what does the research say about CT and policing? Historically, CT was not studied directly in policing. The exploration of thinking skills was begun through exploration of the link between education and police performance. One of the early studies in this area was conducted by Levy (1967). She suggested that deciding who is a qualified officer is much more difficult than deciding who will not be a qualified officer. Potential reasons for this is significant variation in the desires of the various Chiefs of police, over time, and across roles. However, there is great consistency in agreement as to what makes a failure across time and place (i.e., retaliatory aggression toward arrestees, disrespect for legal authority, excessive emotional and behavioural

change). Levy highlights the duality of the occupation – how society asks officers to at once be supportive and controlling. It is therefore necessary to examine those who have survived working in a role where such ambiguous expectations exist, and see how they differ from those who have failed. In this retrospective study, she collected the pre-hire personnel files of 2,139 former law enforcement officers who had left their 14 agencies during the period of 1952 to1962. The officers who left were separated into two groups: Failures (who had been fired or who had been forced to resign) and Non-failures (who had left of their own choosing). From the same 14 agencies she collected the pre-hire personnel files of 2,148 officers who were still employed in 1962 and whose hire dates matched the patterns of the first two groups. This group was referred to as the Currents. Among Levy's findings was one surprise: she found that those with more years of education were more likely to voluntarily leave. Levy cautioned not to assume that poor education would ensure retention, and discussed the possibility that some agencies may not have met the needs of the better educated officers, so these officers may have left for more challenging employment.

While Levy's (1967) findings are dated, the questions surrounding education and policing still exist and have been explored in a multitude of ways since. Even if the profession could achieve agreement on what makes a good police officer, it may be that the most important skills, especially those related to higher education, are the most difficult to measure (Carter & Wilson, 2006). Henson, Reyns, Klahm, and Frank (2010) suggested that the measures available through police service performance evaluations may be flawed, as for example the reliance on numbers may place more value on arrests,

citations, etc. than on resolving disputes. Some studies recognize this difficulty and have used time and resource intensive techniques to collect data. For example, Stebbins and Flynn (1975) gathered data by direct observation and interviews with 29 police officers. One of their findings was that the police officers taking part in a university diploma program saw themselves as having additional roles beyond law enforcement: mediators, protectors, and concerned humane individuals. These officers also appeared to be more concerned with the well-being of the offenders and the community. Rydberg and Terrill (2010) analysed a subsample of data from 3,356 officer–suspect encounters collected via observation and interviews for the Project on Policing Neighborhoods. They found that college education significantly reduced the likelihood of use of force by police officers. They reasoned that the use of force by police is very much up to the discretion of individual police officers and that college educated officers may be more appreciative of and committed to democratic values. LaGrange (2003) conducted critical incident interviews with 176 police officers and used data from 156 of these interviews as these officers reported cases involving mental health issues. She found that officers with university degrees were significantly more likely to make psychiatric referrals instead of arresting persons suffering from mental health crises. Much of the past research that had not found a difference in performance by education level was based on measures involving routine incidents. The true difference may only be seen in critical incidents that are ambiguous, uncertain, and require greater knowledge, judgment, or insight.

It may also take time to see the benefits of education. Smith and Aamodt (1997) measured correlations of education and experience with supervisor performance

evaluations for 299 police officers employed by 12 municipal police departments in the state of Virginia. Their results showed an interaction between college education and experience. They found that (1) less experienced officers did not differ on performance, (2) experienced, college educated officers were the best performers, and (3) performance of high school graduates digressed with experience. Education may serve to develop critical thinking skills that may not be as tested in the initial years as police officers, thus not showing an effect in less experienced officers. As officers become more experienced there may be more opportunities for critical thinking skills to be practiced and observed. Wortley (1997) indicated that the schemata that drive expertise take time to develop. The Canadian Police Sector Council (2009, n.d.a) in their *Policing Competency Dictionary*, defines and sets out 5-level proficiency scales for behavioural competencies: Achievement Orientation, Adaptability, Conflict Management, Critical Judgment, Decision Making, Developing Self and Others, Fostering Relationships, Interactive Communication, Organizational Awareness, Planning and Organizing, Problem Solving, Resource Management, Risk Management, Strategic Thinking, Stress Tolerance, Teamwork, Visioning, and Written Skills. Most of these competency definitions and scale levels relate directly to development of CT by police officers as they gain experience.

The predictive ability of education in comparison to other hiring measures is also important to consider. For example, Gaines and Falkenberg (1998) analysed the results of 419 applicants to a medium sized American police agency during one intake period. They found that education level predicted very similar hiring levels to those predicted using the written test. They also found that if education was used instead of the written test, the

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percentages of African Americans (males and females) moving forward in the selection process would have been much closer to their percentages in the applicant pool. The authors suggested that education would be a more effective screening device and have less adverse effects than a written exam.

There has also been an effort to expand research to include the effects of variables other than education on decision-making. Alison, Kebbell, and Leung (2008) surveyed Hong Kong Police officers on their suspect-interviewing strategies and found that officers with high levels of discomfort with ambiguity were more likely to choose tools beyond the established best practice methods in which they were instructed. The cognitive dissonance they experienced motivated them to try unproven and even questionable methods. In summarizing the decision-making literature on interactions among time urgency, uncertainty, and time pressure, Rastegary and Landy (1993) also cautioned that intolerance for ambiguity (i.e., anxiety caused by ambiguous or unstable situations) when layered with time-pressure can cause decision makers to rush decisions. In a similar review of the literature, Kaplan, Wanshula, and Zanna, (1993) concluded that those with a need for structure may resort to allowing stereotypes to guide their decisions when experiencing time pressures. Ambiguity is common in police work (Henson et al., 2010; Jetmore, 2009; Levy, 1967; Vickers, 2000; Zimmerman, 2006). Rushing decisions and using stereotypes for decision-making would be especially harmful in policing. Comfort with ambiguity is one of the areas included in CT (Bradford & Pynes, 1999; Renaud & Murray, 2008). CT training may thus be helpful to officers in upholding the anti-discrimination stance of legislation such as the *Canadian Charter of Rights and Freedoms*

(1982). By identifying how discomfort/intolerance for ambiguity and need for structure can cause rushed decisions based on little information and stereotypes, trainers can help police officers to form strategies to avoid these mistakes.

Mandel (1992) surveyed 150 participants in four 3-day interviewing and credibility assessment workshops in three Canadian and one American location. The workshops were for those interested in the investigation of child abuse allegations. A plethora of survey measures in response to a hypothetical scenario of a report of child abuse were used to gauge the relationship between CT, decision-making, investigative abilities, general reasoning skills, job-related beliefs, and personality dimensions in social workers and police officers. Unfortunately, too many concepts were included, thus leading the researcher to use only parts of measures and in some cases single items, to assess large concepts. Also, the CT measures were primarily a-priori categorisations of open-ended comments. Lack of quality measures and poor sampling led to very little that could be said with certainty about the few statistically significant results. The summary comment that CT skills are essential prerequisites for effective decision-making lacks the support of quality data.

Champion (1995) studied the relationship between CT and job performance of 189 officers from one American municipal police service by conducting an ex post facto study utilizing a standardized CT instrument and information from their annual performance evaluations. Champion theorized that CT should be central to the success of the new discretion dependent proactive strategic, problem-oriented, and community-based policing approaches. Specifically, he stated that "The basic critical thinking skills, such as

exploring and evaluating alternatives, challenging assumptions, detecting bias, and recognizing inconsistencies in reasoning, will enhance the ability of police officers to make sound decisions within an ever changing environment" (p. 10). However, Champion's results indicated that CT and job performance were not related in his study. There were at least three limitations of the study that may have influenced the results. First, there was only a small variance in evaluation scores, possibly resulting from some supervisors taking the shortcut of rating their subordinates as average rather than taking the time to differentiate between the evaluation categories. Second, the Watson-Glaser Critical Thinking Appraisal scores may have been influenced by variables not included in the study, such as reading comprehension. Third, only the annual job performance rating score was considered, thus limiting the variables explored.

Kooi (2006) also addressed the change of policing strategies and discussed the resulting need for change in police training. Parallels between policing and medicine suggest a move toward PBL may be beneficial. Discretion is again a key theme: "upon graduation and employment, police officers operate in a very autonomous world.... police officers have great amount of discretion, decision-making and problem-solving responsibilities" (pp. 27-28). Kooi surveyed two groups of police academy students, one taught using PBL ($N = 41$) and the other a control group taught via traditional lectures ($N = 56$), on whether the training improved their CT. The findings were similar to research in medicine on PBL (e.g., Hartling, Spooner, Tjosvold & Oswald, 2010) and case-based learning (e.g., Thistlethwaite, et al., 2012). In this case, attitude scores slightly favoured PBL, but not to the level of statistical significance. PBL is intuitively appealing, as police

officers do not receive well-defined problems with multiple-choice or true-false responses in the field. Kooi advocates continuing use of PBL in policing and more research to establish empirical support for its intuitive appeal.

Zimmerman (2006) employed a Naturalistic Decision Making (NDM) approach in a police context to study how novice and experienced police officers ($N = 35$) processed information and determined their actions during simulated scenario based training exercises. One significant departure Zimmerman made from NDM is that the police officers interacted with other people during the critical incident scenarios. In NDM studies, decision makers usually deal with equipment failures, fires, or movement of military vessels, aircraft, etc. This departure led to two findings, not as yet seen in other domains. While uncertainty exists in other domains, uncertainty in policing appeared expected and accepted, probably due to its high prevalence. Participants also sometimes attempted to manipulate the thought processes of the subject, thus venturing beyond altering the physical environment, to influencing the cognitive environment.

Analysis of the scenario reactions and the post-scenario interviews revealed differences between novice and experienced officers. Experienced officers continually assessed the situation and provided more detailed descriptions of their assessments, including interpretations and predictions. Novices focused on describing procedures, their actions and those of the subject. As a result of the experienced officers' continuing assessments, these officers changed their actions in response to new information, whereas novices continued with their initial course of action. These findings were similar to results in other critical incident domains. The Critical Incident Decision Skills training

intervention, provided between the first and second scenarios, unfortunately, did not lead to changes in participants' decision processes. These results are not surprising given that the intervention was limited to a one-day class, while the literature on expertise suggests repeated exposure to a wide variety of domain-specific scenarios and consistent performance feedback are required to see changes (Ericsson & Charness, 1994; Shanteau, 1992).

The research within policing on education has produced mixed results. Difficulty measuring effects, especially in more complex, ambiguous situations, has led some researchers to look at how time pressure may affect the decisions of those with a need for structure and discomfort with ambiguity. Differences between novices and experts and their willingness to continually assess and adapt to changing situations is linked to CT. The NDM literature will need to be expanded beyond manipulation of physical environments, such as encountered by a firefighter, to consider the uncertain, cognitive factors police experience in social domains.

2.4 Research in Related Disciplines

Having reviewed the limited police specific research on CT, it is now important to expand consideration to other related disciplines. This interdisciplinary scope must include findings from other social domains and domains where stress and time pressures are evident. Considering research from other related disciplines may lead to useful information which can be adapted for use in policing. Research in medicine and business includes pertinent findings on dealing with people in social environments. Military research is full of findings on decision-making under stress and time pressures. By

combining findings from these areas, we could identify potential decision-making models for use within policing.

2.4.1 Research in Medicine

PBL was originated to train medical students. The issues around PBL and how it may be helpful in training police officers for decision-making were reviewed in detail by Kooi (2006), were reviewed briefly in the previous section, and were highlighted in the police acceptance of CT section. Suffice to say, medicine has provided a training approach for professional decision-making that has influenced some areas of police training.

Another related approach studied in the medicine realm that may be of benefit to policing is that represented in the research of Kumta, Tsang, Hung, and Cheng (2003). They designed an interactive web-based tutorial program for orthopaedic surgery to improve information transfer. Clusters of 15 students were randomly assigned to two groups (intervention $N = 89$ and control $N = 74$). The intervention group scored significantly higher on the post-module written, clinical, and physical examination measures. Kumta et al. postulated that the active interaction led to evaluation of the thinking process, not just the information provided. They concluded that their web-based tutorials stimulated students to think and fostered better clinical and CT skills, while protecting them from information overload. They propose that the use of online simulations may also be useful for continuing professional education. A key benefit is that complex problem-solving tasks can be made available virtually, therefore negating risks to patients.

These findings provide support for a useful approach to police education and training. Particularly attractive to the police profession are the improvement of information transfer (while limiting the possibility of information overload), accessible continuing professional education via distance learning, and complex realistic problem practice without risk. Some work with police distance education is currently underway by organizations such as the Canadian Police Knowledge Network (n.d.) and other education and training institutions, some of which were previously discussed.

2.4.2 Research in Business

While reviewing research on the escalation of commitment, Staw (1981) identified two primary ways of explaining decisional errors: individual limitations in information processing, or irrationality due to interpersonal effects such as social power or group dynamics. Irrationality may lead individuals to selectively filter information so they can maintain their commitment to a perspective. Staw cited empirical results from previous studies where administrators received the highest ratings when they were consistent and their courses of action led to success. He also found a significant interaction of consistency and success. He proposed four major determinants of commitment: people may escalate their commitment as a way to justify their previous decisions; society values consistency as a social norm; and economically, probability and value of future outcomes influence behaviour.

As can be seen from the findings discussed above, consistency is internally and externally valued for decision makers. However, Tichy and Bennis (2007) suggest that consistency in and of itself is not necessarily a good approach to decision-making. They

present several findings from their research and experience regarding leaders' judgment calls. They suggest that successful judgments occur in a three-phase process, not at a single point in time. The three phases are: preparation, the moment of decision, and execution. Tichy and Bennis highlight the importance of learning and adjusting during the process. In the preparation phase one can make adjustments to the framing of the problem and thus improve the odds of making a successful decision. They advise creating a context for the judgment by developing a story line describing company identity and direction. By comparing possible consequences of a decision to the story line, a decision maker can envision which option will provide the best match. The story line can be prepared and realigned as variables change so that the decision maker is prepared for decisions that may require quick action, like crisis situations or fleeting opportunities. Tichy and Bennis describe the advantages of having a prepared story line as being a frame for choices. A frame helps you identify events and signals in the environment that can help you be proactive and/or may cause you to adjust your story.

It appears to be advisable to have a story line ready for your organization and your approach to your type of 'business', see judgments as a process, and be willing to revisit possible decisions at all phases of that process. It can be difficult to change direction as consistency is valued (Staw, 1981), and it takes significant cognitive effort to continually reassess. However, reassessment is often necessary in policing as the situation may change. As discussed previously, Commissioner Braidwood (2009) criticized the RCMP officers in the Dziekanski case for their failure to reassess their approach when new information was available.

Khatri and Ng (2000) investigated the role of intuition in strategic decision-making by surveying senior executives. Surveys were mailed individually to 1,530 CEOs and other senior officers of 433 companies. Responses were received from 281 individuals from 221 companies. Even though intuition is seen by some as biased and irrational, or even paranormal, Khatri and Ng state that intuition is based on deep, complex understanding and subconsciously draws from a large store of experiential knowledge. They hypothesised that the role intuition played in decision-making would be impacted by the stability of the environment. They found that intuitive synthesis was an important and often used tool in strategic decision-making. Intuition was used more often and with greater success in highly unstable environments. Intuition comes in handy when a quick decision is required, adequate information is unavailable, and no precedent exists. Khatri and Ng suggest that intuition can be developed through repeated exposure to complex, real problems. Mentored experience programs would be one example of such an approach.

2.4.3 Research in the Military

A large segment of recent decision-making research from the military perspective can be traced back to a United States Navy research and development program: Tactical Decision Making Under Stress (TADMUS). The program was initiated as a recommendation from the investigation of the July 3rd, 1988 incident in which the USS Vincennes mistakenly shot down Iran Air Flight 655 over the Persian Gulf. Combat induced stress was believed to have played a significant role in the incident in which 290 people died (Collyer & Malecki, 1998).

Included within TADMUS is research by Cohen et al. (1998) regarding a model of decision-making skills under time stress: the recognition/metacognition (R/M) model. Within this model there is a responsibility on the decision maker to gauge the time available to collect and analyse information, and a realization that usually one will have to act without having a complete picture of the situation. The focus is on preparing decision makers for novel or unexpected situations.

The R/M model is an approach that contrasts with and borrows from a number of decision-making approaches. For example, classical decision theory does not align with the way experienced decision makers have been observed to work. Decision theory requires a complete model at the beginning, with set assessments of uncertainty and preference, thus discouraging dynamic evolution of problem understanding over time. The R/M model recognizes that it is rare that a decision maker will have all the information available from the outset, especially people immersed in dynamic and evolving situations such as those commonly encountered by soldiers and police officers. Additionally, classical decision theory ignores qualitative differences, resulting in the decision output being a statistical average, not a coherent picture of the situation. The R/M model also recognizes that these qualitative differences can have profound effects, especially when dealing with people who can be emotional, irrational, and unpredictable. These types of social domain encounters occur in the military and are certainly everyday occurrences in policing.

Where the R/M model borrows from other decision-making approaches is in its inclusion of pattern recognition and problem solving. Cohen et al. (1998) see a significant

role for pattern recognition in proficient performance during familiar situations, but they also see the need to explore other processes that may be necessary for success in novel or unanticipated situations. They see a role for problem solving, but also see some deficiencies in this approach, namely, the fact that uncertainty and risk are not addressed and general-purpose problem solving does not embrace experience-based recognition. While each of recognition and problem-solving has deficiencies, the two approaches are complimentary in that a combination of the two will mitigate the weaknesses within each single approach.

The pairing of recognition and problem-solving gives the R/M model its structure: recognition skills lead to proficiency in familiar situations where previous responses were appropriate and can be used again, while metacognition skills are needed to evaluate and improve responses as situations change. Another important aspect of this model is the *quick test*. During the *quick test* the decision maker weighs the costs and benefits associated with CT. If the costs of delay are acceptable, the situation is uncertain or novel, and the costs of an error are high, CT should be initiated. If one or more of these three criteria are not met, a recognition based response is acceptable and may even be necessary for a successful outcome. The model includes strategies for CT that can be most effectively taught to students with pre-existing knowledge in a specific domain. In two pre-test/training/post-test studies ($N = 60$, $N = 35$) Cohen et al. (1998) found trends or significant effects on all measured CT skills as a result of domain specific R/M training sessions. For example, the training successfully taught military officers to question assumptions, consider conflicting evidence, and produce alternative responses. The

training also includes the caution that CT is appropriate only when time, risk, and uncertainty warrant it.

In a similar environment, van den Bosch and de Beer (2007) studied the introduction of scenario-based CT training in the Royal Netherlands Navy. In one study they randomly assigned matched pairs of trainee-officers to CT training ($N = 8$) or a control group ($N = 8$). The scenario and test were conducted on paper. The group which received CT instruction, demonstration, and support when working through their scenarios scored higher for all four post-test measures, but only one of the differences was statistically significant. In another study van den Bosch and de Beer used a more realistic task environment at the Operational School of the Navy. The eight participating teams of tactical instructors were randomly assigned to CT training and control groups. Two instructors were also chosen and randomly assigned. Instructors assigned to the CT training group were extensively briefed on the CT training method and how to support trainees in applying CT. Instructors assigned to the control group did not receive the CT briefing and were told to support the participants as they normally would. Two subject-matter experts, who were blind to the goals and design of the study, carried out performance evaluations. Assignment of the evaluators was counterbalanced so that each evaluator rated two CT teams and two control teams. The measures from the previous study were used, with the addition of measures for time management and team behavior. Statistically significant differences were found for four of the post-test measures (argumentation, time management, contingency plans, and team skills), but not for the other two (information processing and actions). The overall results of the two studies

showed improvements in the decision-making processes and the outcomes. van den Bosch and de Beer suggested starting CT training in a simple learning environment with time and support for practice before integrating CT into exercises in more dynamic and interactive learning environments.

The findings of these military studies suggest that CT training if adapted to the operating environment, can lead to significant improvements in decision-making processes and outcomes. There are some similarities between military and police environments that make it probable that approaches successful in military training may be able to be adapted to be successful in police training for decision-making.

2.4.4 Summary

The results of the decision-making research in medicine, business, and the military discussed above provide useful information for consideration in identifying the necessary components of a decision-making model for a social domain. Policing is a social domain with time pressures, resource constraints, and potential for serious consequences. PBL, virtual CT training, understanding the strengths and limitations of decision-makers, and the differing nature of familiar and novel situations are all worthy of inclusion in the consideration of the components necessary for a police decision-making model.

2.5 Related Concepts

CT and its interdisciplinary approach provided a centralized point from which to begin the exploration of decision-making for policing. However, there are a number of related concepts worth considering in order to ensure a thorough exploration of the

decision-making literature. Three of these approaches are general decision-making theories, bounded rationality, and NDM. Each of these approaches include potential components for use in a police decision-making model. Significant findings from each approach are discussed below and the relevant potential contributions are summarized for each subsection. These potential contributions can be combined with the findings from the CT literature to inform construction of questions for the interview and survey phases of this research.

2.5.1 General Decision-Making Theories

The general decision-making theories take a wide-angle approach to the topic. Including these theories in this literature review ensures a broad perspective of views and findings are considered. As this work is exploratory, a broad perspective is necessary. The area has not yet been defined with any accuracy. A premature focused approach on a select specific area (such as solely CT), could lead to the exclusion of important concepts. A broad perspective of consideration will help determine if other areas should be considered for inclusion in this research.

Payne et al. (1993) review the research on many decision-making theories within their book, *The Adaptive Decision Maker*. In their view, individuals have limited capacity to process information and thus, when confronted with a complex decision, use simplifying methods (heuristics) and these methods need to adapt to differ across situations. The assumption is that people want to be accurate, but also conserve their cognitive resources, so they will make intelligent choices on how they will deal with each complex decision task. So, how do we decide how to decide? According to Payne et al.

there are three major classes of characteristics that influence strategy choice, those of the:

decision problem, person, and social context. Strategy selection can be a top-down

process, assessing advantages and disadvantages of available strategies. Strategy selection

also can be bottom-up, developing strategies as new information is encountered.

Anticipated accuracy and required cognitive effort trade-offs usually determine choice of

strategy, but the need to justify choice or the avoidance of conflict may also play roles.

Payne et al. report a hierarchy of responses to time-pressure: accelerate processing,

increase selectivity, or change strategy.

Hammond's (2000) Cognitive Continuum Theory of Judgment (CCTJ) is based on

five premises: (1) the modes of cognition can be ordered on a continuum that is anchored

on one end by intuition and the other by analysis; (2) the middle forms of cognition

include elements from both poles; (3) cognitive tasks can be placed on the continuum

according to which type of cognition the tasks induce; (4) cognitive activities can move

along the continuum in order to maintain constancy with a changing environment; and (5)

cognition is capable of pattern recognition and functional relations. With respect to the

last two premises, it is important to discuss the differential effects of disruptions within a

task (endogenous) and environmental disruptions (exogenous). Endogenous change will

possibly require change from the initial (currently failing) mode, toward the opposite end

of the continuum. For example, a decrease in the time available for a task may require a

change from one of analysis, to a heuristic, or even to pure intuition. Time restrictions,

however, should not require a change away from intuition, as it is a rapid process. A

change away from intuition may be required when novel stimuli enter the task and time is

available to switch to analysis. Exogenous change must be tolerated and the urge to change modes must be suppressed. For example, an increase in noise level, while distracting, should not change the cognitive mode; it should be met with sharper concentration to and focus on the task at hand while using the same initial mode of cognition. Exogenous disruptions test training and discipline, while endogenous disruptions can require creativity. Disruptions can begin as exogenous and develop into an endogenous disruption. Decision-makers need to be taught to discern between endogenous and exogenous disruptions, so they can adapt when needed and stay their course in spite of environmental disruptions when necessary. This can be challenging in situations where there are many stimuli and little time to decide. Discretion needs to be guided by appropriate information, not distracting disruptions.

Hammond (2000) asserts that there are two forms of cognitive competence, namely, subject matter (also referred to as domain) and judgment and decision-making. Domain competence relates to stored knowledge, whereas judgment and decision-making is the application of knowledge. Domain competence is necessary (but not sufficient) to acquire judgment and decision-making competence. Hammond also notes that, learning about performance is necessary to make improvements in judgment and decision-making, but that unfortunately, many professionals do not learn about the outcomes of their performance.

Rastegary and Landy (1993) discuss the time urgency component of the Type A behaviour pattern (originally advanced by cardiologists Friedman and Rosenman) and its effect on decision-making. Type A individuals may be quite good at tasks that are close to

the intuition end of the spectrum as they may recognize and act on familiar situations quickly and efficiently. However, novel situations may pose challenges as Type A's may experience a greater sense of time urgency and attempt to hurry through a task. What worked in familiar tasks may not be appropriate in novel situations. It may be that the ambiguous state of a novel situation would cause discomfort, similar to the previously discussed findings of Alison et al. (2008) and Kaplan et al. (1993). Discomfort may lead to rushed, and thus flawed, decision-making. It may, however, be possible to reduce the degree of intolerance for ambiguity through education (Smock, 1955).

Hammond, Keeney, and Raiffa (1998) discuss some of the unconscious routines we use to cope with complex decisions. They agree with Tversky and Kahneman (1974) in that, for many situations these routines work well, but in some cases poor decisions may result. The invisibility of the routines can prevent us from seeing the effect on our decision-making. Hammond et al. identified some of the common traps such as anchoring; status-quo; sunk-cost; confirming-evidence; framing; overconfidence; prudence; and recallability. The traps can each work in isolation, or together and amplify the error. Complex decisions usually involve many assumptions, estimates, etc. so these are prone to distortion. The best protection from the traps is awareness, so that tests and discipline can be built into decision-making processes to uncover errors in thinking.

In considering the components necessary for a police decision-making model, the general decision-making theories further contribute and/or reinforce a number of relevant aspects. Payne et al.'s (1993) review highlights the need to be adaptive to differing situations. Hammond's (2000) CCTJ illustrates the concept of the decision continuum

with its recognition of endogenous and exogenous disruptions and the distinction of domain versus judgement and decision-making competence. Also identified are the importance of awareness of unconscious effects such as personality influences on the sense of time urgency discussed by Rastegary and Landy (1993) and the routine traps identified by Hammond et al. (1998) and Tversky and Kahneman (1974).

2.5.2 Bounded Rationality

From the general decision-making literature, some cautions are identified regarding cognitive shortcuts. However, there is not universal agreement that cognitive shortcuts always lead to flawed decisions. To provide a balanced and thorough review of the literature, the potential positive aspects of cognitive shortcuts must be included. While some unconscious short cuts can be dysfunctional as identified by Hammond et al. (1998) and Tversky and Kahneman (1974), this does not mean that all heuristics should be avoided. There is research which provides support for the use of heuristics in decision-making. Research on bounded rationality needs to be explored to determine where and when heuristics are functional for decision-making.

March (1994) provides four conditional categories to determine rational procedures of decision-making: alternatives (possible actions), expectations (likelihood of future consequences), preferences (personal value of the consequences), and decision rules (how the choice is made considering the value of the consequences). However, as March sees it, decision makers are limited by their abilities in the areas of attention, memory, comprehension, and communication, so quite often not all four of these categories receive adequate attention. Therefore, he discusses the psychology of limited

rationality. He proposes that cognitively people use targets to simplify our complex world. Thus, instead of seeing things as an infinite number of gradations, we simplify the world into two targets: good enough or not good enough.

Simon (1990) has similar views on human limitations in decision-making, but approaches from a different perspective. His analogy is a pair of scissors: one blade is the structure of the task environment and the other is the limited computational capabilities of the decision maker. The blades bound rational behaviour. Computational requirements of tasks can be reduced by using knowledge and strategies that can be stored in long-term memory. For example, experts use recognition processes, based on stored knowledge allowing them to intuitively solve many problems. Recognition of cues in the environment leads experts to retrieve from memory strategies and information for dealing with similar situations. Situations that are not as familiar may lead to selective search guided by heuristics. In unfamiliar domains, weaker methods, such as satisficing are used.

Johnson, Payne, and Bettman (1993) caution a heuristic may perform well in a given task environment, but that may not hold true across task environments. A decision maker needs a repertoire of heuristics, and knowledge of which heuristics fit which conditions. Changing a variable such as time-pressure will alter the efficiency of heuristics, so decision makers must adapt their strategies to fit changing situations.

Gigerenzer and Todd (1999) took up the caution from Johnson et al. (1993) by exploring heuristics in more detail to determine what works when and where. They begin their exploration with a review of why unbounded rationality and optimize under constraints are unrealistic. Unbounded rationality does not recognize the constraints of

time, knowledge, or computational capacities. They place probability theory with the maximization of expected utility and Bayesian models in this realm. The calculation of all benefits and costs necessary for optimization under constraints also makes this approach unrealistic. Gigerenzer and Todd go on to provide support for bounded rationality approaches. They recognize that different domains require different specialized tools, thus their concept of the adaptive toolbox: "the collection of specialized cognitive mechanisms that evolution has built into the human mind for specific domains of inference and reasoning, including fast and frugal heuristics" (p. 30).

Todd and Gigerenzer (1999, 2003) point out that there are situations that do not require a trade-off between speed and accuracy, as fast and fugal heuristics can sometimes be more accurate than analysis of all available data. Ecological rationality relates to the environmental conditions that allow this to happen: the right fit of Simon's (1990) scissor blades – the right heuristic for the specific environment. Social rationality is a special form of ecological rationality that must also be considered when fitting heuristics. Social environments change with great speed and as a result of decisions made by others. Todd and Gigerenzer review empirical studies that show that fast and frugal heuristics can be effective and efficient in social domains. Effectiveness and efficiency in complex environments are necessary in times of competition, but this would also be beneficial in policing when safety is paramount. Geographic profiling is one concrete example of potential police heuristic use. Snook, Canter, and Bennell (2002) compared the accuracy of human judges ($N = 21$ university students) with a geographic profiling system in the prediction of the home location of serial offenders. The students had no

previous knowledge of geographic profiling and for the first viewing of the 10 spatial displays were given no heuristics for use in predicting the home location of the serial murderers based on the location of five offences. Before a second viewing of the displays, the experimental group were provided two one-line heuristics regarding distance-decay and circle hypothesis. These were simplified versions of the mathematical constructs utilized in computerized geographic profiling systems. The error distances significantly decreased in the second phase for the experimental group, but not for the control group. The small amount of training received by the experimental group led to results that were, on average, as accurate as the computerized system. Snook, Taylor, and Bennell (2004) found similar results in a follow-up study with a larger group of subjects ($N = 215$).

Dhami and Harries (2001) studied hypothetical decisions of general practitioners ($N = 36$) in 130 cases of decisions to prescribe or not prescribe lipid-lowering drugs and found that there was no significant difference in the mean fit of regression and fast and frugal prediction models. Fast and frugal models often use one or only a few cues, yet are flexible enough to allow more cues when necessary for "grey-area" cases. Dhami and Harries advocate communicating judgement policies to help individuals make consistent, accurate decisions, and reduce discrepancies. For such a model to be useful, it must be easily understood, thus transparent, non-mathematical descriptions are needed. Dhami (2003) also found through a four-month observation study of two courts (342 decisions by 57 benches comprised of combinations of 111 judges) that one cue (a previous decision by police, prosecutor, or another bench) predicted judges' bail decisions. Heavy caseloads, appear to have led these judges to use a heuristic in place of legal due process.

Kleinmuntz (1990), in discussing the head versus formula debate (Dawes, 1980; Dawes, Faust, & Meehl, 1989; Freyd, 1925; Meehl, 1986; Sawyer, 1966; Viteles, 1925; and for a more recent review of the debate, see Grove, Zald, Lebow, Snitz, & Nelson, 2000), recognizes as per Simon's (1990) bounded rationality that cognition is limited. In response to limits of time, resources, and cognitive capacity, Simon argued that people use heuristics. Sometimes, these heuristics lead to good decisions, and other times, heuristics lead to biased decisions. Kleinmuntz divided the faults that lead to bias, or incorrect cognitions, into three categories: task, judge, or mismatches between the two. The risks for all of these categories can be minimized in various ways. Task risks can be lessened by improving instructions and using better response modes. Often experience is absent the necessary feedback from which to learn and adapt, so judges' abilities can be improved with extended training and feedback to best utilize that experience. Domain-specific expertise or task matching to existing cognitive skill can improve the task-judge match. Kleinmuntz also advocates conducting detailed analyses of when to use intuition versus more analytical thinking to reduce judgmental errors. Even with these approaches, Kleinmuntz still offers cautions. Models are not perfect and can contribute to existing biases by preserving and reinforcing them and in some cases even magnifying the effect. Also, models may be flawed if they are based on incompetent judges. People can be hesitant to remove decisions from experts and place their faith in a model (for a recent study in this area, see Eastwood, Snook, & Luther, 2012). Therefore, Kleinmuntz recommends that both head and formulas be used. This hesitancy is especially true in

tasks that are ill-structured, uncertain, or ambiguous and the stakes are high if the decision is wrong.

Bounded rationality approaches recognize challenges inherent to policing, such as information availability, time pressures, and competition for cognitive resources. When identifying components necessary for a police decision-making model, these challenges within the context of social domains must be considered. Police officers must be trained on making decisions that go beyond the satisficing strategies of good enough versus not good enough. As experience develops, recognition will help with familiar situations, but all police officers need to be able to react to changes in the task environment, thus an adaptive tool box with fast and frugal heuristics could be helpful. The bounded rationality literature has illustrated that, improving instructions, using better response modes, providing feedback, recognizing the role of domain-specific expertise, and conducting detailed analyses of when to use intuition and/or heuristics versus more analytical thinking are all suggestions worth considering for component identification.

2.5.3 Naturalistic Decision Making

Most of the research on decision-making has focused on well-defined situations (Maule & Svenson, 1993). However, uncertain, time-pressured, high-risk settings also require research. The NDM approach adopted by the military (e.g., Cohen et al., 1998; van den Bosch & de Beer, 2007) and others is also appropriate for policing (Flin, Pender, Wujec, Grant, & Stewart, 2007; Zimmerman, 2006). To be sensitive to the contextual pressures inherent in police decision-making, a thorough literature review must consider findings from this genre of studies. Zimmerman (2006) used the NDM approach to study

initial assessment change in response to changing situations. If decision makers fail to take the significance of changes in the situation into account and remain on their initial course of action, the results can be disastrous. As discussed previously, Zimmerman found that novices were more likely to ignore changes and stay on their initial course of action. Experienced officers often make accurate spontaneous decisions, but often they cannot explain their thought processes after the fact. Good intuition is often the explanation. Guided reflection may reveal concrete cues that were present. Noticing these cues can allow for recognition and thus influence action choice or change. An understanding of the cues and processes would enable design of training to facilitate development of police officer decision-making skills.

It is also important to understand the effect of time-pressure on change of strategies. Edland and Svenson (1993) propose that time-pressure may trigger coping processes. Coping may progress in the hierarchy discussed previously: acceleration, selectivity, and change in strategies (Payne et al., 1993). If there is no possibility of changing the strategy due to severe time constraints or lack of available strategies (such as for a novice), avoidance may be the outcome. Avoidance may take the form of a heuristic, sticking with the original course of action, or complete failure to act.

From the above perspective time is a resource facilitating decision-making, but in practical applications time must also be viewed as a scarce commodity (MacGregor, 1993). Time is a resource that must be managed appropriately so that the right amount of time is used to reach good decisions without wasting time. MacGregor also points to degradations in decision-making which can occur at transitions in task tempo. If

performance demands are changed quickly, decision makers will need to rapidly shift their responses. Having alternate strategies readily available will facilitate rapid response shifts. Training for rapid shifts and providing alternate strategies will help decision makers adapt. There may also be a need to change back to an original strategy if the task tempo again changes. The decision maker must be reconsidering the situation as it evolves. Unfortunately, people tend to rely on simple cognitive strategies, so they may not return to a more complex initial strategy after adopting a simpler strategy, even if the state of urgency has passed.

NDM approaches recognize the fluid nature of ambiguous, evolving situations and the challenges of reacting appropriately to change under time pressure, especially for novices. Any model for police decision-making should include components for guidance during ambiguous, evolving situations, as these are a daily reality for police officers.

2.5.4 Summary

As discussed above, the findings from the literature on the related concepts of general decision-making theories, bounded rationality, and NDM provide multiple components for consideration for a police decision-making model, including some significant areas of overlap. There is recognition across these areas for the challenges of time pressures and changing situations. The need to adapt, and the need for awareness and tools to effectively work within these challenges and constraints are common themes. Suggestions on how to move novices to expert status include using decision continuums, improving instructions, using better response modes, providing feedback, and recognizing the role of domain-specific knowledge.

2.6 Practical Implications

Policing is an applied profession, so any knowledge offered must be practical for police to see it as valuable and usable (Dean, 2006). Training is one area where knowledge can be practically applied. Studies conducted on decision-making training of police and other practitioners must be reviewed through this practical lens. Robertson (2004) advocates the use of PBL scenarios and student-centred teaching strategies for practice in applying techniques to novel, ill-defined, ill-structured, complex problems for aviation. He also advocates continuing to use the behaviourist approaches to teach the check lists that are needed in day to day repeated tasks and procedures. He concludes that each approach is needed in preparing student pilots. A similar approach may be necessary in policing.

Blum and Polisar (2004) point to the tendency by some police officers during unexpected events to experience a sense of urgency to take control. Taking control in an urgent manner may lead to excessive force or other improper use of their authority. Another inappropriate reaction may be split-second immobility in the face of a threat, resulting from the lack of a readily available and appropriate strategy. Blum and Polisar highlight the need for training to prepare for novel situations, as without this training officers will "react with neurochemical, survival-oriented instinct reactions to the perceived threat, as opposed to strategic, purposeful reactions that are based upon the conditions the officer is facing" (p. 2). The traditional goal of police training has been skill acquisition and retention of material (e.g., legislation and procedures). Training police officers to make decisions in varying levels of stress exposure will require a

change in training methods. The conditions in policing can change in a moment. Police officers must be able to adapt their decision-making and actions in real time to novel and evolving conditions.

There is an ongoing discussion within policing and by some academics over what police training should entail and numerous approaches to answering that question. One often referenced study of this issue was a survey conducted by Ness (1991). The respondents were a stratified random sample ($N = 210$ of 317 responded, 60.6% return rate) of Illinois police recruits over an 18-month period (population of 1,036). The respondents felt the training was not preparing them to perform some important tasks. This study varied from others in that those surveyed had at least six-months experience on the job, whereas most other studies ask about training just before or immediately after graduation from the academy (e.g., Kooi, 2006). It is difficult for new graduates to say if they were adequately prepared before they take on the role and experience the occupation. The best they can say is whether they feel prepared to take on the role. Ness compared the list of tasks performed with the ratings and found that many of the low rankings corresponded with tasks that were reportedly not performed. However, there was no mention of whether Ness considered that the lack of performance might be due to avoidance of tasks which the officers did not feel confident to perform. Instead, Ness suggested the need to determine which of the tasks and thus task training groups are no longer useful.

Legal decision-making is acknowledged as different from other types of decision-making in numerous ways: training for the various decision makers ranges greatly;

pertinent information may not be available; and feedback on the quality of the decision is unlikely, thus legal decision makers rarely suffer any consequences for poor decisions (Dhami, Hastie, Koehler, & Wiener, 2007). Increased accountability measures, such as the previously discussed *R. v. McNeil* (2009) ruling, may increase the level of consequences, but unfortunately the feedback and consequences may be for egregious errors only and may be more punitive than instructive. Improving the frequency and timeliness of feedback is a key area for improvement.

Error management training (EMT) may be a process worth exploring in this area. EMT includes both active exploration and explicit encouragement to make errors and learn from them. Keith and Frese (2008) conducted a meta-analysis of 24 studies ($N =$ 2,183) and their review indicated that when EMT outcomes are compared with error avoidant training or exploratory training without error encouragement, there are considerable variations in effect sizes, but the mean effect of EMT across the studies was positive and significant (Cohen's $d = 0.44$). In studying the moderator variables, they concluded that EMT is likely to be most effective for situations where practitioners will need the ability to adapt to and transfer their acquired skills to tasks that are novel and were not directly represented during their training.

In a related approach, the R/M model and training designed by Cohen et al. (1998) includes scenario-based practice with interactive simulation and feedback. Performance measures for CT processes and outcomes are also used to evaluate the success of the training. In their view, cognitive task analysis is an essential tool in the development of a training strategy. Their model and training were based on the results of critical incident

interviews with practitioners. The training includes multiple segments, including an overview of their take on CT, called STEP. Decision makers are taught that they can improve their understanding of a novel situation by constructing a **S**tory around the known information that includes expected past, present, and future events. Decision makers then compare expectations to what is known from the story to **T**est their assessments. The next process is to **E**valuate the result to assess the assumptions in the story. If there are too many unreliable assumptions in the story, decision makers need to generate alternative assessments and stories. During the process they must **P**lan for the possibility that their current story may be wrong. Educators and researchers agree that CT exercises must be made explicit, as they are here, to realize significant improvements (e.g., Van Gyn & Ford, 2006; Williams, Oliver, Allin, Winn, & Booher, 2003).

The feedback process is exemplified in Cohen et al.'s (1998) critiquing of stories stage. A devil's advocate technique is introduced to uncover hidden assumptions in stories and generate alternative interpretations of the information. Decision makers are also taught that CT is not always appropriate and that decision makers need to evaluate the time available using the *quick test* to decide when to critique and improve an assessment and when to immediately act. Experienced decision makers differ from novices in their approach to the judgments. With respect to costs of delay, experienced practitioners explicitly ask themselves how much time is available and they buy time by estimating available time more accurately and more carefully plan their response. Novices focus on immediate goals and the associated error stakes, rather than higher level and longer term

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error potential. Experienced decision makers are more comfortable with ambiguity in that they realize that a pattern may not exist that fits the situation perfectly.

The devil's advocate role used by Cohen at al. (1998) is similar to the previously discussed contrarian view proposed by the Royal Newfoundland Constabulary (2005) and accepted by Commissioner Lamer (2006). Avoiding the confirming-evidence trap identified by Hammond et al. (1998) and Kleinmutz's (1990) suggestion to systematically search for evidence to disconfirm hypotheses are also similar.

Klein, Phillips, Rall, and Peluso (2007) in their exploration of sensemaking provide three assertions applicable to this part of the discussion. The first is that motivation for further exploration decreases once the available data fit the frame held by the decision maker, but if there are potential personal benefits to further exploration, the sensemaking can be extended. The second is that experts and novices reason the same way, but experts have a greater repertoire of frames. So, it is not the process that needs to be taught, but the frames. The third is that decision makers generally rely on just-in-time models. Therefore, fully worked out mental models may not be as useful as exploring various causal relationships. Klein et al. also recommend providing process feedback, not just outcome feedback for scenario practice and teaching decision makers to manage their attention so they are less vulnerable to distractions.

Police novices in a three-year mixed methods study ($N = 90$) recognized that their probationary time was the time to ask questions of their more experienced colleagues, as it was expected of them and it was not viewed as burdensome or a sign of incompetence (Harris, Simons, & Carden, 2004). The authors also recognized that by observing multiple

officers deal with varied situations the novices were building a repertoire of best practices. Unfortunately, they also had to reconcile some conflicting views and work practices. Each of the differing situations, work practices, and views observed and experienced would teach the novices something. These lessons could then be adapted to synthesise and forge their own approaches.

There have been some accomplishments in providing decision-making tools for police. Hoffman, Lawrence, and Brown (2004) reported on the creation of the National Use-of-Force Framework for Canadian police officers. The framework is a nonlinear situational model that reflects the dynamic nature of potentially violent situations. Linear models had failed to reflect the dynamic nature of situations where police may be met with resistance and violence and would thus need to use force. Police officers begin by assessing the situation so they can assess and act. The subject's behaviour, the officers' perceptions, and tactical considerations are also included in the assessment. A use-of-force option is selected and utilized, while the assess, plan, and act process continues throughout the interaction. The training that accompanies the framework includes the presentation of a variety of scenarios based on real incidents. The police officers must apply the model and critically evaluate the outcomes. The framework promotes continuous critical assessment and evaluation. The model also provides a means to help police officers articulate to supervisors, courts, inquiries, etc. why and how they used the force option(s) they did. It is used by most police services in Canada, but some agencies are adapting it or developing their own. The Royal Canadian Mounted Police (n.d.b) Incident Management/Intervention Model is an adaptation of the National framework and

the Edmonton Police Service developed a Reasonable Officer Response framework (Demarco, n.d.). Use of scenarios and frameworks is consistent with Shanteau and Dino's (1993) suggestion of using pre-thinking as a strategy to deal with difficult problems that may be urgent. They felt this was necessary as they had observed a decrement in creativity for emergency personnel in an artificially induced, stressful environment.

Decision-making models in the police context are primarily used for use-of-force training, and at the other end of the cognitive continuum, for major case management. Recently, there has been some progress in expanding across the cognitive continuum with police decision-making models. For example, the United Kingdom has adopted a National Decision Model (College of Policing, n.d.). The model is comprised of six key elements:

- Code of Ethics;

- Information;

- Assessment;

- Powers and policy;

- Options; and

- Action and review.

The Code of Ethics is at the centre of the model and must be considered at all stages. This model provides a lot to consider while making decisions. Aside from gathering and considering information from various sources, the model includes guidance to: develop a working strategy from a threat and risk assessment, identify options including contingencies, take action, and review.

The consideration of practical implications leads to a list of potential components for a police-decision making model. Performance on routine, repeated tasks can be improved through checklists, but novel, ill defined, ill structured, complex situations require a different approach that could potentially be taught using PBL. Distractions, a sense of urgency, varying levels of stress, lack of self-confidence in preparation levels, lack of pertinent information, and absence of feedback can lead to errors. EMT, frameworks, and scenario practice with feedback could be beneficial and could carry the practical approach valued by field practitioners such as police and other emergency responders. The R/M model includes many of the practical considerations from a military perspective and may be able to be adapted for use by police officers.

2.7 Research Implications

In *Educating the Reflective Practitioner*, Schön (1987) provides the following analogy that is illustrative of the work that lies ahead:

> In the varied topography of professional practice, there is a high, hard ground overlooking a swamp. On the high ground, manageable problems lend themselves to solution through the application of research-based theory and technique. In the swampy lowland, messy, confusing problems defy technical solution. The irony of this situation is that the problems of the high ground tend to be relatively unimportant to individuals or society at large…while in the swamp lie the problems of greatest human concern. (p. 25)

It is in the swamp that we find ourselves when we study the world of decision-making and CT for police officers. Policing exists day to day in that swamp of ambiguity, and police officers, administrators, educators, and trainers need the results of research to guide the profession. While not all research results will provide neatly packaged technical solutions, there are advancements that can be made. Some of the readily practical

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applications have been discussed, but there are areas that require more exploration and

research.

Hammond (2000), in reviewing the literature on the effect of stress on judgment

and decision-making, summarizes the tension between laboratory and field approaches:

reliability in one, rich data in the other. He also recognizes that:

> Those who actually make judgments under stress will place their faith in
> results obtained from field studies or anecdotes – they can compare the
> information with their own experience – whereas researchers who have
> chosen to invest their lives in laboratory research will demand the
> assurance that scientific methods afford. And this divergence in choice –
> with its irreconcilable clash in values – will persist until someone,
> somehow, finds a way to encompass the advantages of each and diminish
> the disadvantages of each. (p. *x*)

The detailed documents now available through processes such as Flanagan's

Critical Incident Technique are held up by Hammond as an improvement in this area.

Hoffman, Crandall, and Shadbolt's (1998) review of the Critical Decision Method (and its

four basic techniques of: protocol analysis; case-based reasoning; structured interview;

and retrospection) shows that this adaptation of the Critical Incident Technique has been

used successfully with various practitioners, including firefighters. It would be a good

choice for use with police as it is sensitive to NDM issues. Hoffman et al. also support the

inclusion of illustrative stories in training as the details of the stories can facilitate recall

of instructions and enrich knowledge of examples used in assessment and recognition

across both routine and novel situations.

Hammond (2000) also points out that the research on stress and judgment is

spread across many domains, including: clinical, social, human factors, physiological, and

medical. So, along with bridging the laboratory and field divide, we also need to broaden

the interdisciplinary foot path into a serviceable road. Cross-fertilization of ideas is catching attention in the judgment, decision-making and industrial-organizational psychology, and organizational behaviour fields (Dalal et al., 2010), so there is movement in this interdisciplinary direction.

Something we need to bear in mind as we explore decision-making is that there is growing evidence that emotion and reason are not independent. According to Hammond (2000), it is a good thing that emotions are entangled with reason. He posits that emotional, intelligent thought evolved because it facilitates survival by adding concentration, strength, and endurance in emergencies. Blum and Polisar (2004) have recognized the link and the need to include consideration of emotional reactions when training police officers. Some approaches to ethical decision-making in policing include this consideration (Perez, Moore, & Volk, 2010).

Daley (2001) interviewed 80 social workers, lawyers, adult educators, and nurses about their experiences after continuing professional education sessions. A constructivist approach was found across all professions and arenas. The reflective process triggered by these challenges led to reorganization and rethinking their approaches to their work. Incorporating knowledge was identified as a recursive, transforming process as they thought about, used the information in practice (action), and then reflected again on the information, transforming it as needed. How the process evolved however, differed across professions so it appears that continuing professional education may have domain specific effects that should be studied in more detail.

Flin et al. (2007) suggest examining the effects of time-pressure on cue selection of police officers: which information receives their focus and do they have strategies for "buying time"? Police officers often must make multiple decisions in a single incident. Flin et al. suggest exploring how officers prioritise and schedule decisions and actions and how they manage competing goals. Zimmerman (2006) concurs – seeing the need to understand how expertise develops over time.

Reviewing findings regarding CT and its related concepts across policing and other related disciplines identifies practical implications that then also influence how research may need to be conducted to further the search for the necessary components of a police decision-making model. The swampy terrain of field research, preferred by practitioners, encourages non-laboratory and non-experimental approaches to gather data. The Critical Decision Method allows the expert practitioners to guide the researcher to the important information. With an open gate to explore, an interdisciplinary approach will most likely be needed. Some hints are available through previous research with practitioners that show recursive, transforming processes and impacts of emotion may play roles. Additionally, cue selection and the ability to buy time may differ by expertise level, and thus merit further study.

2.8 Theory/Approach Comparisons

The presence of discretion and the potential for significant consequences highlight the need for the study of police decision-making. The concept of a continuum with intuition and rational analysis at the poles is a helpful construct, as police officers require decision-making skills that span the entire continuum. Research can determine how to

help police officers with these decisions; the findings from the literature reviewed here can inform an applied model for police decision-making. The literature reviewed above relates primarily to five theories/approaches: the adaptive decision-maker, CCTJ, bounded rationality, NDM, and the R/M model. Table 2.1 contains comparisons of the reviewed theories and approaches to decision-making across the three categories of characteristics that affect how practitioners decide: problem, person, and social context (Payne et al., 1993). The problem is characterized by the specifics of the task and the immediate environment in which the problem is occurring. The person is characterized by their cognitive ability and their relevant prior knowledge. The social context is characterized by accountability and group membership. As can be seen from the table, all the reviewed theories and approaches contain considerations for the problem and person characteristics, but unfortunately the social context category has not been addressed to the same extent.

Table 2.1: Theory/Approach Comparisons across Characteristics

	Characteristics		
Theory/Approach	Problem	Person	Social Context
Adaptive	√	√	√
CCTJ	√	√	
Bounded Rationality	√	√	√
NDM	√	√	
R/M Model	√	√	√
Mechanisms:	scenarios	recognition	devil's
	STEP	feedback	advocate
	quick test		

CCTJ and NDM are primarily concerned with the rational and objective aspects of decisions, and thus do not consider the impacts of emotions and social cognition. The adaptive decision-maker and bounded rationality approaches specifically highlight the non-rational aspects of decisions and include consideration of the impacts of emotions and social cognition. The R/M model, while evolving from NDM, is concerned with both rational and non-rational aspects of decisions, incorporating objective thought, emotions, and social cognition. It also includes developed mechanisms for use with all three characteristic categories. The devil's advocate mechanism lends itself well to

consideration of issues arising from accountability and group membership. The social context is particularly important in policing and must be included in any model for police decision-making.

The reviewed literature included multiple theory-driven and proven decision-making models. It also included support for a customized domain approach when teaching CT. Police decision-making may be best served by combining these attributes. . The R/M model is a proven theory-driven model, and as can be seen from the last row of Table 2.1, it contains a variety of mechanisms to address all three characteristic categories. The strengths of the R/M model for a role in police decision-making are many. To summarize the strengths discussed throughout the literature review, the principle advantages are as follows.

1. The R/M model is designed for a NDM environment with time constraints, high risk, and uncertainty; policing is such an environment.

2. In contrast to some traditional decision-making theories, the model approaches are representative of the way decision makers have been observed to work.

3. The *quick test* is practical for deciding when to think more or act.

4. The STEP process improves CT and prepares decision makers for novel or unexpected situations (metacognition), not just the routine procedures (recognition); it uses head and formula as appropriate. The CT exercises are explicit for significant improvement.

5. The R/M model shares the most salient strengths of the reviewed theories and approaches, and can accommodate improvements such as heuristics specific to policing.

6. Process and outcome feedback is important in building capability and confidence.

7. The devil's advocate mechanism can be adapted to a truth advocate approach to increase the social context consideration essential for policing.

8. Stories are an accepted part of the police culture, thus the STEP process begins with something familiar and accessible. Stories provide a means to study social context and provide the domain specific approach necessary to improve CT.

For these reasons the R/M model is the best choice for a beginning framework. With the suggested modifications for social context and domain adaptations, the R/M model can be used to prepare decision makers for the infinite number of possible combinations of all three categories of characteristics. The next step is to analyse stories for scenario creation, which can be achieved through critical incident analysis, using the Critical Decision Method. Once the domain knowledge has been analysed it can be combined with an adapted R/M model to form a comprehensive police decision-making model.

2.9 Rationale for Two Methods

Following the literature review, it was decided two methods would be used to gather the contextual information. The first step was to conduct semi-structured interviews with a group of front line uniform police officers. The information from these interviews was then used to prepare a questionnaire for administration to a larger number of front line uniform police officers for validation and expansion of the findings. The

supporting theories, procedures, and results for each method are described in the next two chapters.

The following research explores critical incidents and decision-making competencies specific to policing to compare these with findings from the general CT and decision-making literature. The focus is on front line uniform police officers making decisions in situations of varying levels of available time and resources. An important caveat is that the issue of stress caused by these limitations is explored, but this is not a thorough investigation of the impact of stress on police decision-making.

Chapter 3: Critical Incident Analysis Interviews

3.1 Method

In 1985 Klein, Calderwood, and Clinton-Cirocco conducted a study, the objective of which was to examine decision-making of experts in consequential time pressured situations. They interviewed fire ground commanders about critical incidents. They found that decisions were not being made after considering multiple options, as most decision-making theories predicted. As a result, they posited their recognition-primed decision model. Their results were presented at a conference and written up in a report, but were not published until 25 years later (Klein, Calderwood, & Clinton-Cirocco, 2010). Klein, Calderwood, & MacGregor (1989) did elaborate on the technique used in the 1985 and other studies when they published an article entitled, "Critical Decision Method for Eliciting Knowledge." They described their Critical Decision Method as a knowledge elicitation strategy which grew out of efforts to model the naturalistic decision-making they had witnessed outside the laboratory with firefighters, tank platoon commanders, paramedics, and design engineers.

The advantages of the Critical Decision Method are many. The events have already occurred, so there is no time wasted waiting for applicable events to occur. This retrospective interview strategy begins by asking the interviewee to select an incident that meets the criteria of a critical incident in which they were time pressured and their decisions had significant consequences. Once the incident is selected, the interviewee is asked to describe the incident and their decision-making. Then a semi-structured format is used to probe various parts of the decision-making. The incident account is revisited

through three more angles: time line verification identifying decision points, progressive deepening of the context, and "What-if" queries. By beginning with the interviewee describing the incident in their own words and providing a list of prompts for later use, the interviewee's memory is stimulated and the potential bias from the interviewer is reduced. This approach also fosters a feeling of cooperation as the interviewer is viewed as a listener instead of an interrogator. Once the interviewer has heard the description they then have an understanding of the situation that they can use in conjunction with their prompts to move toward a fuller description of the decision-making process during three re-visitations of the information. This occurs in a conversational manner, but is also guided by the objectives of the study. This combination leads to detailed information while still making efficient use of the time available with the interviewee.

There are some potential limitations of the Critical Decision Method. Interview methods are affected by the domain experience of the interviewer. If an interviewer knows very little about the domain under study, he/she will tend to ask more probe questions than someone who has previously heard that information. This can lead to inefficient use of time. On the other side of this, an interviewer with experience in the domain may ask less probe questions which may lead to more efficient use of the time available, or negatively it may also lead to loss of information if the interviewer does not explore in enough detail. Another potential limitation is the use of verbal reports. These are not direct representations of cognitive processes. The data however, are richer in detail and are of more practical interest than laboratory observations of inconsequential

decisions. If the potential limitations are managed, this is a very efficient method of compiling rich data.

As discussed in the literature review, there is a need to compare the police decision-making context to others previously studied in more detail, and to analyse stories for scenario creation. The research questions are thus: how do police officers assess critical incidents and make decisions; and what variables factor into police decision-making in complex and ambiguous environments? As field research is preferred by practitioners, non-laboratory and non-experimental approaches will be more approachable for their participation. Semi-structured interviews conducted using guided recall of critical incidents, such as is done in the Critical Decision Method (Klein, et al., 2010; Klein, et al., 1989; Hoffman, et al., 1998) result in detailed information. These methods also allow the expert practitioners to guide the researcher to the important information. This domain knowledge must be identified and analysed before it can be combined with a decision-making model for use in police decision-making. The research questions guide the interviews and those results then lead to the creation of appropriate, directed and closed-ended questions for inclusion in the survey questionnaire. The results from the two methods when combined with the literature review, identify the necessary components of a police decision-making model and the themes specific to the policing domain.

3.1.1 Semi-Structured Interview Guide

Following the lead of Klein, et al. (2010), Klein, et al. (1989) Cohen, et al. (1998), LaGrange (2003), and Zimmerman (2006), semi-structured interview guides for critical incident interviews with active practitioners were designed. Hoffman, et al. (1998)

reviewed the work by Klein and other NDM researchers who developed and refined the Critical Decision Method to aid in overcoming memory loss and to enhance awareness of decision-making processes through introspection. The technique is meant to be adapted to specific domains. Zimmerman did this for her research on police in simulated scenarios. Her approach has been adapted here to review actual critical police incidents instead of simulations. Additionally, this research explores two incidents per interview, one with optimal decisions and one with less than optimal decisions, while other research using this technique has explored single incidents in each interview, thus not allowing for comparison between differences in processes for incident outcome types.

The author has an academic background of applied social psychology, was employed for 15 years in policy, planning, and research analytical and managerial positions with a midsize police service, and has designed and taught courses in a university police studies major program for 9 years. Information obtained during academic study and these 24 years of professional experience through research, observations, and conversations with subject matter experts was also used to guide construction of the interview format and cognitive probe questions.

3.1.2 Recruitment

A formal request to participate in a study on police decision-making was sent to a midsize Canadian police service (see Appendix A). The general parameters of the research were discussed with the Deputy Chief of Patrol Services and there was an interest in pursuing the research. An email request was then distributed to patrol officers that outlined the research and asked interested officers to voluntarily contact the

researcher via email to discuss their participation in the study and schedule a convenient time to conduct the interview (see Appendix B). The invitation was purposively restricted to frontline officers to ensure critical incidents would be recent and thus more accessible for recall. No other parameters were specified for inclusion of volunteers. Participation in the interviews was voluntary – no incentives were offered. Ten officers volunteered and one semi-structured interview was conducted with each volunteer.

3.1.3 Interviews

Critical incident analysis interviews were conducted. Upon arrival, the volunteers were shown to the interview room and were given an informed consent document to read (see Appendix C). They were given time to read the document in detail and ask any questions they had about the document and the research process. Once the document was signed, the interview began.

All the interviews were conducted face-to-face. Nine of the interviews were conducted in the Bounded Rationality and Law Laboratory in the Psychology Department of Memorial University. One interview was moved to another location due to last minute unavailability of the lab. The interviews were audio recorded. Notes were also taken during the interviews for the purpose of reviewing the information from the free narratives during the later stages of the interview and to assist in analysing the responses after each interview was completed. A semi-structured interview guide was used for the interviews (see Appendix D). The method of contact, the interview materials, and recording procedure were approved by Memorial University's Interdisciplinary Committee on Ethics in Human Research (ICEHR).

The volunteers were informed that the purpose of the interviews was to increase understanding of police decision processes when encountering time-pressured, ambiguous situations where there are significant potential consequences for those present. They were assured that the researcher would not be evaluating their decisions or actions, only trying to understand the decision process during those incidents. They were notified the interview was being audio recorded to allow multiple reviews of their responses for data analysis, but that all the information obtained in the interviews is confidential and that the recordings will not be reviewed by anyone other than the researcher.

The volunteers were asked to think about incidents during their careers when they had to make decisions that impacted the individuals involved in the situation while they were present with the individuals. They were asked to then choose from these, incidents where the solutions were not obvious, but they did not have a lot of time to consider the solution, and there were significant potential consequences for those present with them. They were asked to pick two incidents: one where they felt they could have made a better decision and one where they were confident they made the best decision possible. For ease of reference, but without judgment, the first category of incidents was termed the *less than optimal decision incidents* and the second category of incidents was termed the *optimal decision incidents*. The volunteers were informed they would talk about the less than optimal decision incident first and the optimal decision incident second. The potential probe questions were the same for each incident type.

The interviews followed a five-step process: 1) incident recall, 2) incident recapping, 3) time line verification and decision point identification, 4) progressive

deepening, and 5) "what-if" queries. The procedure was adapted from Zimmerman

(2006), who obtained it from Hoffman et al. (1998).

3.1.3.1 Step 1: Incident Recall

The volunteers were asked to recount the episode in its entirety, from beginning to

end, providing as much detail as possible. They were asked to start from the moment they

"got the call." They were asked to summarize what the call was about and then proceed

to describe the event including what they did, what they saw, heard, smelled, felt (see

Fisher & Geiselman, 1992). They were also asked to describe the thoughts they had as the

incident unfolded, cues and indicators they picked up from individuals' behaviors or other

sources, perceptions about motives and intentions, their decisions and action choices, and

rejected actions. Once the volunteers finished recalling the incident, they were asked if

they had anything they wanted to add. If so, details were added and when no further

details were recalled, the interview moved on to step 2.

3.1.3.2 Step 2: Incident Recapping

The volunteers were told they would go over the story multiple times in an effort

to collect as many details as possible. The researcher related each story back to the

volunteers to make sure there was a complete understanding of what was said in step 1.

The volunteers were asked to listen to the details and sequence and to add additional

details, clarifications, and corrections. The volunteers were asked if the retelling was

accurate and complete. If not, details were adjusted and when the volunteer deemed the

retelling complete, the interview moved on to step 3.

3.1.3.3 Step 3: Time Line Verification and Decision Point Identification

The volunteers were asked to create an approximate time line for each incident. The time line was composed of the important events, decisions, and actions taken during the event. The incidents were divided into segments and key events and points when decisions were made and actions taken were identified to determine when important information was received and when action choices were contemplated. They were told to approximate and that the researcher was aware that the perception of the passage of time would be impacted by the events, but that this subjective information would also be useful when studying decisions in these types of situations. Once the time line was complete and the decision points were identified, and the volunteers had nothing else to add, the interview moved on to step 4.

3.1.3.4 Step 4: Progressive Deepening

The volunteers were told that they would be asked about the key cognitive components from the incidents. The researcher asked questions to focus attention on particular aspects of each decision-making event. The questions were focused on the information, or cues, used in situation assessment, and about the expectations, goals and actions those cues elicited. They were told that the goal was to identify what you knew, when you knew it, how you knew it, and what you did with what you knew. A list of potential probe questions was included in the semi-structured interview guide. Other questions were also asked that were specific to the incidents. Once this area was fully explored, the interview moved on to step 5.

3.1.3.5 Step 5: "What-if?" Queries

During the final account of each incident, the focus was shifted from the actual experience to a more analytical strategy. The interviewer posed various hypothetical changes to the account of the incident and asked the participants to speculate on what might have happened differently, how they may have responded differently, and how the outcome may have been altered. Again, a list of potential probe questions was included in the semi-structured interview guide and other questions were also asked that were specific to the incidents. Potential errors were identified at each decision point, and how and why these errors might occur were discussed. The volunteers were assured that the purpose of discussing these potential errors was to understand the vulnerabilities and critical junctures within the event, not to highlight things officers may do wrong.

Once the five steps were completed for the first incident, the same process was used to explore the optimal decision incident. After exploring both types of incidents, the volunteers' demographic information was recorded. At the end of each interview the volunteers were reminded that the purpose of the interview was to understand how police officers assess critical incidents and make decisions, and that this information would be used to develop a survey for Canadian police officers that would help the researcher develop a decision-making model for front line policing. They were asked if they had any questions. If so, the researcher answered their questions and then they were thanked for providing interesting and useful information, and for giving so freely of their time.

3.1.4 Response Coding

As the objective of this research was to discover variables which factor into decision-making in complex and ambiguous environments, a grounded theory approach to data analysis was utilized. Corbin and Strauss (2008) indicate that a grounded theory approach is good for starting to understand complex and ambiguous environments. They also suggest decision-making as one of the areas particularly suited for grounded theory research. There is very little research available on police decision-making, so there is little theory that has been tested within the police context. Complexity and ambiguity are characteristics of the police context. The NDM research is defined by embracing this complexity and ambiguity. NDM and the exploratory nature of grounded theory data analysis are well suited to one another. The three aims of grounded theory are theorizing, description, and conceptual ordering. The interviews were designed to provide thick and rich description of the context within which police decisions are made. Instead of using researcher defined concepts, respondent-driven research allows the voices of interviewees to be heard and concepts to be developed in terms that are meaningful to them and their colleagues. This has been used successfully in studies with police (e.g., Schulenberg & Warren, 2009; Venema, 2016). As was discussed in the literature review, there are research results from related areas, but the focus of this research was on the policing context. Not knowing what might carry over, the best approach was to keep an open mind and listen to the practitioners. Only after data collection for each stage was complete were the comparisons made.

Corbin and Strauss (2008) identify personal and professional experience as one of the four main areas from which problems are identified for grounded theory research. They report that a reform ambition can often be a driver to instigate research. The researcher in this case had worked with a police service for 15 years in the areas of planning, research, and policy development and has been designing and teaching police studies courses for another 9 years. Reform ambition played a large role in identifying this area of study. The professional background was also helpful in understanding the environment of the participants as the terms used and incident types described were familiar, thus increasing the researcher's sensitivity to nuances and subtle cues in the data. Connections were more obvious to this researcher than would be for someone not familiar with the context. This sensitivity can come at the price of objectivity, so care must be taken to remain true to the data. The researcher's academic background of applied social psychology was helpful in choosing and designing appropriate methods and minimizing the potential for bias. As Corbin and Strauss (2008) advise one must describe the research procedures in detail, ask broad questions, ask questions of the data, and compare similarities and differences. Mixed methods are also suggested as a means to triangulate. Qualitative data analysis is often exploratory, as it is used here. In this case the data is used to identify concepts and to ask more specific questions in the second phase, the survey. The sensitivity/objectivity balance here was also tempered by the researcher not being a police officer. Asking questions as a researcher was readily accepted by the participants, allowing areas to be explored in detail.

The aim was to identify concepts for the police decision-making context. Consistent with the suggestions of Corbin and Strauss (2008), the researcher reviewed responses after each individual interview looking for developing concepts. Comparisons were made across interview steps, within (comparing the responses for the less than optimal to the optimal decision incidents for each volunteer), and between volunteers. Similarities and differences were noted as a classification system emerged. In-vivo codes were crafted directly from the words of the participants and altered as other mentions of the same or similar information was encountered. Direct quotations are not provided here as the aim was to create concepts and categories that could be used in the construction of a survey instrument. Additionally, as only ten interviews were conducted and all interviewees were from the same organization, it would not have been prudent to include lengthy quotations as these would have risked breeching the anonymity of the participants. The in-vivo codes are amalgamations of terms used by multiple respondents where applicable and are shortened and generalized when only one response was identified for a concept. The codes for concepts were compared and grouped into categories. The recordings and notes were reviewed again and the number of interviews in which each concept was mentioned was tallied and is reported below. The researcher was the only person to review the data as this was guaranteed to the participating police service and the interviewees. The researcher had an established reputation of professionalism with the police service, so this single reviewer approach was used to remove potential barriers to full and honest participation. Opening the data to more

reviewers would have allowed for inter-rater reliability checks, but it would have likely reduced sharing of information, especially in the less than optimal incident category.

3.2 Results

This study consists of two methods, the second of which depends upon the results of the first. The data from this first method thus needed to be analysed before moving on to the creation of the data gathering instrument for the second phase of the research, the survey. The results for the interviews will thus be described here, before moving on to describe the details of the survey.

3.2.1 Participants

There was an equal split of five women and five men interviewed. Their ages ranged from 23 to 56 years, with an average age of 32 ($SD = 10.04$); the median age was 29. Their years employed as police officers ranged from 1 to 31 years, with an average years-of-service of 7 ($SD = 8.49$); the median years of service was 5. The highest level of education received ranged from some university and college to multiple bachelor's degrees. One participant indicated that s/he had some university and college, one had a university diploma, and eight had bachelor's degrees (including 1 with multiple bachelor's degrees, 1 applying for a master's degree, and 1 half way through a master's degree). Nine of the participants were at the rank of constable (including one acting sergeant and multiple officers with experience as coach officers) and one staff sergeant.

3.2.2 Categories

Review of the interview recordings and notes lead to the identification of concepts which were then grouped into higher level categories. The categories that emerged were:

- incident type;

- danger present;

- injuries occurring;

- cognitive/emotional state of subject;

- location type;

- time of day;

- dispatch accuracy;

- factors impacting decisions;

- helpful things considered when making decisions;

- take away knowledge;

- feedback on information received from trainers;

- other methods of learning;

- negatives; and

- suggestions for improvements.

The ten interviews each included descriptions of two incidents. The interviewees each identified an incident where they felt they could have made a better decision and one incident where they were confident they made the best decision possible. In total 20 incidents were discussed. Seven incident types were identified through the coding. In some cases, more than one incident type occurred per incident, but the most serious incident type was recorded, as is the standard for police data reporting. The number of less than optimal and optimal incident types, respectively, were:

- mental health crises (6, 4);

- domestic disputes (1, 2);

- impaired drivers (1, 2);

- intoxicated person (1, 0);

- motor vehicle accident (1, 0);

- break and enter (0, 1); and

- theft (0, 1).

Four (3, 1) of the incidents also involved assaults against police officers. These were not identified as incident types as the assaults were results of interactions at the scene, not the reason police were at the scene. Danger was present for the majority of calls discussed. All but two (1, 1) were incidents in which a subject was a danger to him/herself (8, 6) and/or others (9, 6). Half of the incidents (4, 6) involved no injuries, but the other half (6, 4) involved some combination of injuries to officers (3, 0), injuries to subjects (3, 1), self-inflicted harm to subjects (1, 3), or deaths (2, 1); these numbers total to more than ten as multiple types of injury occurred in three (3, 0) incidents.

The cognitive and/or emotional states of subjects were identified in most discussions. All but three (1, 2) incidents involved people in emotional (7, 4) or altered (2, 4) states. This corresponds with the large number of mental health crises incident types identified above. Only one of the people in an emotional state was not identified as undergoing a mental health crisis at the time of the incident. Three impaired drivers and one intoxicated person were identified in the incident types and thus provides four of the altered states. Two more altered states were identified, but were co-occurring with mental health crises, which took precedence in the recording of incident types.

There was a mix of incident locations, with eleven occurring in public (4, 7) and nine occurring behind closed doors (6, 3). Time of day varied, with most incidents occurring at night (5, 3) and evening (1, 6), and the minority occurring in the morning (2, 1) and afternoon (2, 0). Dispatch accuracy was high as most of the calls were accurately identified from the dispatch or initial on view details (8, 8), however four (2, 2) began as dispatches to what were identified as minor or routine calls that turned out to be more serious once the officer(s) arrived and collected more information.

The first seven categories of: incident type, danger present, injuries occurring, cognitive/emotional state of subject, location type, time of day, and dispatch accuracy are factual information categories. These were described as facts and would have been recorded in the officers' notes and files. The next seven categories of: factors impacting decisions, helpful things considered when making decisions, take away knowledge, feedback on information received from trainers, other methods of learning, negatives, and suggestions for improvements are nonfactual. These categories include information that would likely not be recorded in notes or files and instead focus on the cognitive processes as described by the interviewees and are thus more open to interpretation by the interviewees themselves in identifying and the researcher in recording the information. For these categories, it may be helpful to consider these within the contexts of which they were discussed. For this reason, the remaining categories are divided between the less than optimal and optimal decision incident descriptions.

3.2.2.1 Less than Optimal Decision Incidents

The factors impacting decisions category featured heavily in discussion of the less than optimal decision incidents. The number of interviews in which each of the following factors were mentioned are provided below:

- physical and/or mental health of the subject (10);

- safety of self (9);

- safety of onlookers, neighbours, others potentially involved (7);

- distance between officer(s) and subject (5);

- availability and timing of back up/specialty units (5);

- availability of cover (1);

- availability of equipment (1);

- pressure from public, supervisors, and Crown Attorneys (1); and

- media on scene (1).

When interpreting these numbers, it is important to remember that these are numbers out of ten. Therefore, all interviewees when discussing their less than optimal decision incidents mentioned the physical and/or mental health of the subject. Safety of self and safety of others were also mentioned in most of these discussions with sixteen combined mentions. Concern for safety was also apparent in the factors of: distance between officer(s) and subject, availability and timing of back up/specialty units, availability of cover, and availability of equipment with twelve mentions in total. Less considered were pressure from public, supervisors, and Crown Attorneys and the presence of members of the media on scene with only two mentions.

The category of helpful things considered when making decisions included five concepts. These concepts are provided below with the number of interviews in which each was mentioned:

- information from dispatch, public, and records (6);

- previous experiences with similar situations (4);

- knowledge of specific persons through their own interactions or from incidents related by other police officers (3);

- policy and procedures of their police service (3); and

- legal guidance (1).

Available information, situational experience, and knowledge gained through their own experience or related by other officers were the most often cited with thirteen mentions in total. The written directives and available legal guidance were less often cited with only four mentions in total.

The category of take away knowledge was almost as varied as the number of interviews, as it included nine concepts with only one concept being repeated in multiple interviews. The concepts were:

- talk and plan more with partners on scene before proceeding (3);

- check records after interactions to learn more about the individual for future interactions;

- be aware of the difference between actual and perceived passage of time;

- some safety precautions need to be started earlier;

- know the science of impairment;

- change tactics for next time (e.g., use a different tool earlier);

- avoid escalating a situation, (e.g., stand back further from subject);

- recognize cues of aggressive behaviour to come, and communicate to de-escalate; and

- shorten distance before telling someone they are under arrest to allow faster and easier control for handcuffing.

The feedback on information received from trainers was mixed. One interviewee acknowledged trainers' advice had been proven, even though they had not fully believed the cautions during training. One reported that they had received mixed direction during training due to interpretations differing among trainers. For example, interpretation of various pieces of case law involving impaired driving seemed different across trainers. One indicated they had tried to go by the book, instead of using a quicker and more efficient technique and this landed them in difficulty; situations are never exactly the same as training, in training everything goes as planned.

Four other methods of learning were identified, with only one being repeated in multiple interviews:

- bring forward information from their own similar previous experiences (2);

- stories about unusual situations heard from other police officers and telling their own stories about these types of experiences;

- critical incident stress debriefings are important, but also operational debriefings are good opportunities for junior officers to give their input, ask questions, learn, get feedback; and

- watch a senior officer handle a scene without escalation.

Two interviewees cited some potential negatives. One identified that sometimes senior constables escalate a scene (e.g., drawing weapons), and young recruits follow suit even though they do not feel it is necessary. The interviewee also noted that with experience there is more confidence to disagree with the approach of a senior constable. There was recognition in one interview that there was often no time or attention available to plan, and adrenaline and instinct (not training) guide reactions.

3.2.2.2 Optimal Decision Incidents

Eight of the ten optimal decision incidents were more recent instances than the less than optimal incidents recalled in the first part of the interview, and thus occurred at a time when the officers had more experience. In a study of this size and type, there is no way of stating with confidence whether there is a causal link between length of experience and quality of decisions, but the trend is worth mentioning.

Similar to the discussions of the less than optimal decision incidents, helpful things considered when making decisions were also identified here. The category was the same, but the concepts differed. The only overlap was policy and procedures. There was a difference in frequency, however, as these written guidelines were the most frequently mentioned in the optimal decision incidents with five mentions, but were the second least frequently mentioned in the less than optimal decision incents with three mentions. These three mentions were from interviewees who mentioned policy and procedures as being helpful in both the less than optimal and the optimal decision incidents. The things that

were considered helpful when making decisions during the optimal decision incidents with the number of interviews in which each was mentioned were:

- policy and procedures (5);

- be able to articulate decisions (3);

- watch body language (3);

- listen to what is being said, including volume and voice cues (2);

- use distance and cover to plan and communicate with coworkers on scene and/or supervisor (2);

- assess potential presence and use of weapons by location and how the weapon is being held (1);

- play out the potential conversations in your mind, including scenarios (1);

- break the process down into sub goals (1);

- more seniority equals more flexibility (1); and

- more patience to avoid escalating based on time available (1).

Again, similar to the discussions of the less than optimal decision incidents take away knowledge was also identified here. The category was the same, but the concepts (knowledge types) were all different. Officers reported learning five things through their experiences which constituted take away knowledge, with only one being repeated in multiple interviews:

- in extreme circumstances there is always the potential for an emotional reaction, even in your coworkers (2);

- with experience you can start to recognize calls that may result in complaints;

- patience with the process will usually lead to getting the suspect eventually;

- you cannot go wrong with giving rights and caution; and

- a good coach or field training officer, especially one with specialist skills, can teach you a lot and give you extra confidence when dealing with specific situations.

Feedback on information from trainers from the less than optimal incident decisions was added to by one officer who identified helpful training from use of force courses, including the diagram of coloured zones for baton strikes that they visualized during the incident. Additionally, on reviewing the incidents and asking probe questions, one volunteer mentioned training that they had forgotten they received. They had used the tools but did not initially remember when or how they had learned the techniques.

3.2.2.3 Suggestions for Improvements

After both types of incidents were discussed and sometimes during the discussions, interviewees provided individual suggestions for improvements. The classifications in this category were each mentioned by only one interviewee. The suggestions were:

- include more unpredictable situations in training;

- put yourself in different situations with different people;

- learn from others in the system, including police officers, judges, Crown Attorneys, and defence lawyers;

- cover and provide all the details and facts, then find evidence, corroborating or not;

- record conversations with violent or suicidal people through opening mike to dispatcher; and

- remind officers on roll call of consequences of complacency (e.g., missing a knife in a search).

3.3 Conclusion

In combination with the literature reviewed, the author's experience was of practical benefit while designing this study. The experience provided an informed starting point from which to decide which questions to ask and in what manner. The information gathered through the semi-structured critical incident analysis interviews were reflections about individual incidents and thus were very specific. This specificity and the small number of volunteers did not result in response saturation. Saturation is defined for the purposes of this study as the point when no new relevant information emerges from the data to contribute to the theory under construction (adapted from Saumure & Given, 2008). While more volunteers could have been beneficial, there were some repetitions of themes. Some of these themes were not present in the literature. Themes from the literature and the interviews provided the opportunity to include closed-ended questions in the survey. The respondents could be prompted and could respond quickly with minimal effort to much of the questionnaire, thus reducing barriers to participation. The inclusion of open-ended questions for additional input allows respondents opportunities for deeper consideration and individual reflection, thus not limiting the larger pool of respondents in the survey to only agreeing or disagreeing with the views expressed by the small group of interviewees. Another advantage of including both closed and open-ended

questions is it allows for collection of both quantitative and qualitative data. The

responses from the interviews were combined with findings from the CT, NDM, and

police literature areas, to prepare the questionnaire for the survey.

Chapter 4: Survey

4.1 Method

4.1.1 Recruitment

The Canadian Police Sector Council (n.d.b) links page provided a base listing to identify 200 Canadian police services (see Appendix E). The Associations, Education/Training Institutions, Affiliated Groups, Federal Government Departments Relevant to Policing, and Provincial Government Departments Responsible for Policing listed on the site were not included in the 200 police services.

One of these police services was asked and agreed to pilot test the questionnaire before invitations to participate in the survey were sent to other police services. Feedback was received and the data reviewed from 9 questionnaire responses. There were minor wording and format changes made after the pilot test, but the questionnaire did not substantively change from the pilot to the survey. Additionally, most of the demographics of the respondents to the pilot were close to the larger data set and where there were some differences, the small size of the pilot group was not enough to substantially skew the demographics. The largest difference was that 44% of the pilot respondents were female, whereas only 19% of the total group were female. Without the pilot respondents, the percentage of females would decrease to 17%. The other difference was that the age range was extended from a minimum of 25 to 24 with inclusion of the pilot respondents. All other demographics were within the ranges and close to the percentages found in the larger group. Therefore, the responses to the pilot test are included in the data set.

Once the pilot study was complete, attempts were made to contact the remaining police services with requests to invite their frontline uniform police officers to voluntarily participate in an online survey on police decision-making. Where provided, links to the police service websites were followed. For some the links were no longer active or were incorrect. In some instances, links were not provided. For inactive, incorrect, and missing links searches were conducted via online search engines. Where available from the websites, the email address of the Chief of Police or the Office of the Chief/Executive was used to send the email contact with a letter of invitation individually addressed to each Chief of Police attached (see Appendix F for text of the letter). If this type of email address was not available a general email address for the police service was the next option. In cases where none of these were available, another suitable email address was sought. These were for an assortment of roles including: media relations, police commission contacts, municipal employees, website administrators, etc. If no suitable email address could be found, the last choice was to use a contact form on the website if it was available. Some of these contact forms allowed the letter to be attached, while others would not accommodate attachments, so a request for an email address was sent in these instances.

The letter requesting participation in the research highlighted the need for decision-making research for front line police officers and the importance of police officers themselves providing context from which to compare decision-making research and models from other professions. The letter included an introduction to be sent to officers by email, which included a link to the online survey. Contact information for the

researcher was also included to enable anyone within the police service who had questions about the research to contact the researcher. The method of contact and the survey were approved by Memorial University's ICEHR.

Of the 200 police services: no email or form of electronic contact was located for 24; the website was down for 2 (multiple attempts were made over several days); a request was not sent for 5, as there appeared to only be one or two officers in each of these services; 2 services had been absorbed by another service and thus no longer existed as distinct entities; 1 appeared to be ceasing operations; and 1 no longer exists (with no explanation as to if it was absorbed or ceased operations). Thus, 165 police services were available to contact. For 19 of these, there was no English text available on the website and there was no obvious contact information for the Chief/Director of Police; thus, these services were omitted from the contact list. Some French services provided English translations and some of the French only sites provided obvious contact information and thus were included. Two of these responded and asked if French versions of the contact letter and questionnaire were available. They were informed that the researcher did not speak French and there was no funding available to provide translation services, apologies were also extended and a suggestion was made that if officers were interested in responding in English, that it would be appreciated.

For 2 of the services, the emails bounced back as undeliverable and no other method of electronic contact was found, leaving a total of 144 services. The pilot test was conducted with 1 of the police services. Responses were received from 29 other police services. As previously mentioned, 2 of these inquired if the documents were available in

French. For the remainder: 4 were thankful for the interest and invitation but declined to participate; 12 agreed to distribute the invitation to officers; 5 indicated they were considering the invitation, but no further information was provided; 6 indicated the invitation had been forwarded to their Chief of Police for consideration. No response was received from the remaining 114 police services, with the exception of 1 service that contacted the researcher after the data had been analysed and apologized that the email had been misdirected within the organization. To increase anonymity and allay potential concerns of police service administrators, the officers were not asked to identify their police service, size of service, or region. Therefore, it is not possible to identify which police services participated in the survey.

4.1.2 Procedure

Respondents who clicked the link to the survey were first asked to submit their email address to receive a unique password and that password was subsequently separated from their email address to make the procedure anonymous. Once participants gained access to the survey, they were asked to read an informed consent form. The password request process, the informed consent, and the full survey text are attached in Appendix G. Participation in the survey was voluntary and no incentives were offered. After agreeing to participate, respondents were then presented with each of the seven questionnaire sections consecutively, with demographics being collected in the final section.

At the end of the questionnaire participants were asked to confirm the consent they had provided at the beginning of the survey by responding to the question "Do you

consent to your answers being used in this study?" by either checking "yes, submit data" or "no, withdraw from study". The second consent confirmation requirement was added by Memorial University's ICEHR during the approval process.

The participants were thanked for their time and valuable input and reminded that their responses to the survey will provide police context to be combined with existing decision-making models to develop an approach to form the basis for education and training of police officers regarding front line decision-making. They were also reminded that they could contact the researcher (with email address again provided) if they would like a copy of the survey results, and that upon completion, the thesis will be accessible to the public at Memorial University's Queen Elizabeth II Library.

4.1.3 Survey Instrument

Throughout the survey, participants were asked to think about incidents during their policing careers when they had to choose an action, but the solution(s) were not obvious, they did not have a lot of time to consider the solution, and there were significant potential consequences for those present with them. In the first section, they were asked to describe how they would typically make a decision in this type of frontline policing, ambiguous, time-pressured, and consequential situation. Open-ended responses were collected via text box.

In the second section, participants were asked to rank six categories of offences from most to least challenging from a decision-making perspective, based on their own experience. The scale included a 0 option for "have not dealt with" and a 6-point scale anchored on each end by 1 = *most challenging* and 6 = *least challenging*. The six

categories of offences were: violent crime, property crime, other Criminal Code offences, Criminal Code traffic violations, drug offences, and other federal statute violations. These are the categories of offences tracked annually by the Canadian Centre for Justice Statistics *Juristat* publication (Boyce, 2015). Violent crime as defined by this publication includes homicide, other violations causing death, attempted murder, sexual assault - level 3 - aggravated, sexual assault - level 2 - weapon or bodily harm, sexual assault - level 1, sexual violations against children, assault - level 3 - aggravated, assault - level 2 - weapon or bodily harm, assault - level 1, assault peace officer, other assaults, firearms - use of, discharge, pointing, robbery, forcible confinement or kidnapping, abduction, extortion, criminal harassment, uttering threats, threatening or harassing phone calls, and other violent Criminal Code violations. Instead of supplying a lengthy list of all of these offences, the examples of homicide, assault, firearms, robbery, harassment, and threat were included in the questionnaire. Property crime includes breaking and entering, possess stolen property, theft of motor vehicle, theft over $5,000 (non-motor vehicle), theft of $5,000 or under (non-motor vehicle), fraud (excluding identity fraud), identity fraud, mischief, and arson. The examples included in the questionnaire were breaking and entering, theft, fraud, mischief, and arson. Other Criminal Code offences include counterfeiting, weapons violations, child pornography, prostitution, terrorism, disturbing the peace, administration of justice violations, and other violations. The examples included in the questionnaire were counterfeiting, weapons violation, child pornography, prostitution, terrorism, and disturbing the peace. Criminal Code traffic violations include impaired driving, and other CC traffic violations. These were included in the

questionnaire as the examples. Drug offences include possession - cannabis, possession -

cocaine, possession - methamphetamines, possession - heroin, possession -

methylenedioxyamphetamine, possession - other drugs, trafficking production or

distribution - cannabis, trafficking production or distribution - cocaine, trafficking

production or distribution - methamphetamines, trafficking production or distribution -

heroin, trafficking production or distribution - methylenedioxyamphetamine, and

trafficking production or distribution - other drugs. The examples included in the

questionnaire were possession, trafficking, production, and distribution. Other federal

statute violations include Youth Criminal Justice Act, and other federal statutes. The

example included in the questionnaire was the Youth Criminal Justice Act.

In the third section, participants were asked to indicate their level of agreement

with three statements pertaining to the challenging nature of calls involving domestic

disputes, intoxicated persons, and persons in mental health crisis. Each of these call types

were identified in multiple interviews as challenging situations. The three statements

were:

- Responding to domestic dispute calls is challenging.

- Responding to calls involving intoxicated persons is challenging.

- Responding to calls involving persons in mental health crisis is challenging.

The scale for response was: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 =

agree, and 5 = *strongly agree*. In this same section, participants were also asked to add

any other challenging categories of incidents they have experienced, and explain what

makes each of these additional incidents challenging for decision-making. Open-ended responses were collected via text box.

In the fourth section, participants were asked to indicate their level of agreement on fifteen statements pertaining to situational characteristics. These characteristics were reported by the interviewees, primarily as factors that influenced their decisions. Each of the situational characteristics were followed by the phrase, are/is "a high priority of consideration." The scale for response was: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, and 5 = *strongly agree*. In this same section, participants were also asked to add any other situational characteristics they would consider a high priority, and explain what makes each of these additional characteristics important. Open-ended responses were collected via text box.

In the fifth section, participants were asked to indicate their level of agreement on thirteen statements pertaining to techniques and information used in decision-making. These were reported by the interviewees as helpful when making decisions. Each of the techniques/information were followed by the phrase, is/are "helpful." The scale for response was: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, and 5 = *strongly agree*. In this same section, participants were also asked to add any other techniques or information they would consider helpful when making a frontline police decision, and explain how these are helpful. Open-ended responses were collected via text box.

In the sixth section, participants were asked three open-ended questions. In the first question, participants were asked to describe techniques or information they use in

their frontline decision-making that they have learned through training. In the second question, participants were asked to describe techniques or information they use in their frontline decision-making that they have learned through experience. In the third question, participants were asked to provide suggestions on how to improve the preparation of officers for decision-making in the field. Open-ended responses for the three questions were collected via text box.

In the seventh section, participants were asked to provide their gender, age, years employed as a police officer, highest level of education received, and rank. Responses for all five demographic questions were collected via text box.

4.1.4 Coding of Open-Ended Responses

Responses to the open-ended questions in the survey (sections 1, 6, and 7 and the second parts of sections 3-5) were reviewed for coding by the researcher. As was the case with the interviews, the researcher was the only person to review the survey data as this was guaranteed to the participating police services and the participants. This single reviewer approach was used to remove potential barriers to participation. The researcher has worked on initiatives with the International Association of Law Enforcement Planners, the Canadian Association of Chiefs of Police, the Canadian Association of Police Educators, the Canadian Police Sector Council, the Canadian Police Knowledge Network, and multiple police services. These initiatives have provided opportunities to work with many police service professionals who could attest to the applied experience and professionalism of the researcher. Opening the data to more reviewers would have allowed for inter-rater reliability checks, but it would have likely reduced participation, as

police services are not always welcoming to academic researchers (Bradley & Nixon, 2010).

Guidance for qualitative data analysis found in Elo et al., (2014) and Hsieh and Shannon (2005) was consulted prior to beginning analysis of the survey responses. The process for categorisation began with comparing the responses to the concepts identified through the grounded theory approach to data analysis used in the interviews. These concepts were compared for similarities and differences with new variations added to provide richer detail, and new concepts identified beyond those found in the interviews. The researcher read all the responses for a question, copying novel responses into a text document. As similar responses were found, the concepts were combined to reflect the emerging categories. Exact and synonym word matches were grouped with terms that directly related to the frequently used words. For example, safety was a category identified through combining words and terms that included safety, injury, harm, risk, protect, combative, kicking, punching, life, death, defensive, casualties, weapons, armed, threat, danger, and force. The context was also reviewed in each instance to ensure the words were related to the concept, not referring to some other meaning for the words. The text entries grouped by category were reread and a general overview drafted. The draft overviews were read and compared again to the original responses. The overviews were edited for clarity and finalized. The responses were then reviewed and if a category was represented in a response, the response was included in the tally for that category. The responses were reviewed again and the category counts were adjusted if necessary. The number of respondents who included a response matching a category are provided after

each category description. Many respondents provided diverse information that matched more than one category within a response to a single question. To capture all relevant information, all data were tallied which resulted in response numbers totaling more than the number of respondents for that question. This is an indication of the complexity of police officer decision-making; one category per question is not sufficient for explanation.

The results provided throughout section 4.2 are from the respondents, with no opinions or observations from the researcher included in the reporting, beyond that necessary to code the open-ended responses into categories and some instances where acronyms were spelled out or a small amount of context was provided to facilitate the comprehension of readers not familiar with police terminology. Any external information provided for context is identified by citation. Provided quotations were also not edited for spelling, grammar, or punctuation. The categories, descriptions, counts, and contexts provided are the results of this process being replicated for each open-ended question.

4.2 Results

4.2.1 Participants

Police officers from Canadian police organizations completed the online survey. There was a two-stage consent process. The respondents had to give consent at the beginning of the questionnaire after reading the informed consent information and they had to confirm this consent again at the end of the questionnaire after they had completed all sections. One hundred and fourteen respondents completed the questionnaire and confirmed consent for their answers to be used in the study ($N = 114$). Two officers

completed the questionnaire, but responded with "no" when asked to confirm consent for their answers to be used in the study and twenty-three officers partially completed the questionnaire. The data for these 25 officers were not included in the analysis, as they did not confirm consent at the end of the questionnaire. There were an additional 25 requests for passwords to the system that did not have associated data entered in the system.

Of the 113 officers who indicated their gender, 91 (81%) were male and 22 (19%) were female. Of the 112 officers who indicated their age, the mean was 41 years ($SD = 8.51$, Range: 24–60). Of the 113 officers who indicated their number of years working as a police officer, the mean was 16 ($SD = 9.50$, Range: 1–48). Of the 112 officers who indicated their highest level of education received, 8 (7%) indicated high school, 66 (59%) indicated some post-secondary, 31 (28%) indicated bachelor's degree, and 7 (6%) indicated master's degree. Of the 112 officers who reported their rank, 67 (60%) were constables, 6 (5%) were detectives, 21 (19%) were sergeants, 10 (9%) were staff sergeants, 1 (1%) was a lieutenant, 6 (5%) were inspectors, and 1 (1%) was a chief of police.

Regarding representativeness of the sample, it is difficult to ascertain how closely this group of respondents comes to matching the demographics of the larger population. According to the latest statistics available through the Canadian Centre for Justice Statistics *Juristat* publication "Police Resources in Canada, 2016," on the snapshot date of May 15, 2016 there were 68,773 police officers in Canada (Greenland & Alam, 2017). This number represents all police officers whereas, this survey was targeting frontline police officers only. The percentage of police officers in frontline positions will vary

across police services and time, so it is unclear what percentage of the population the 114

respondents represent. As the services who participated were also not required to indicate

to the researcher that they would be participating, nor were the respondents required to

provide their police service name, it is unknown how many police officers the survey

invitation reached. Comparing the demographic makeup of the sample to the overall

police population gives us more information. The sample was comprised of 19% females,

while the national percentage on May 15, 2016 was 21%. While a detailed breakdown by

age is not available, it is known that the proportion of police officers aged 40 years and

older was 55% in 2016. The sample matches this percentage. National data for the

number of years working as a police officer and highest level of education received are

not available for comparison to the sample. Regarding rank, there are percentages

available for combined categories. Nationally the percentage of police officers who were

constables was 71% as compared to 65% (constables and detectives) in the sample.

Nationally the percentage of police officers who were non-commissioned officers

(sergeants and staff sergeants) was 25% as compared to 28% in the sample. Nationally

the percentage of police officers who were senior officers (all ranks above staff sergeant)

was 4% as compared to 7% in the sample (lieutenant, inspectors, and chief of police).

4.2.2 Section 1 Decision-Making Description

Of 114 respondents, 95 (83%) provided responses to the open-ended decision-

making description question. The extent of experience often showed in the responses.

Some officers were new to policing and that showed as they mentioned relying on coach

officers and training, while more experienced officers noted using approaches that had

proven successful in similar situations. Some approaches were briefly stated and only represented aspects of the process, like react or public safety first. Some respondents felt that in an emergency there would not be time to think, just time to move, relying on training for reflex and automated response. Some responses were more involved, but relied on generalized terms like analytical skills, common sense, tactical options, instincts, and good judgement, instead of articulating specific steps. In contrast, other responses were complex including lengthy check lists, mental role playing, scenario visualization, ethics consideration, etc. By combining the information provided, a composite of decision-making advice emerges that can be divided into five categories. The five categories of decision-making advice (and the number and percentage of respondents who mentioned each) are provided in Table 4.1.

Table 4.1: Categories of Decision-Making Advice (Section 1)

Decision-Making Advice Categories	Number of Respondents Who Mentioned Category	Percentage of the 95 Who Provided Responses
Information	75	79%
Safety	53	56%
Planning	32	34%
Respite	16	17%
Articulation	13	14%

4.2.2.1 Information

The Information category included lists of information types that should be considered. If the pause/respite referred to in the third category is achievable, officers must collect all the pertinent and available information and choose the right option for

continuation. Types of information to consider were provided in multiple responses, for example:

- type of crime or situation;

- environment;

- witnesses;

- evidence to be preserved;

- suspect(s);

- state of mind, demeanor, and responses of the people on scene;

- knowledge, skills, abilities, and experience of officers present;

- availability of other resources;

- history with complainant, suspect, environment; and

- policies, best practices, Criminal Code, provincial statute, case law.

Beyond these factual aspects, multiple responses included references to other less concrete aspects which must be considered, such as:

- objectivity;

- empathy or putting yourself in others' shoes;

- optics which could affect reputations of officers/organization; and

- acting ethically/morally, which may be a more involved process.

Communication was highlighted as important, including if time allowed, communicating with a supervisor or experienced colleague. Weighing safety risk with seriousness of offence and pros and cons of options are guided by the above information and training in such areas as defensive tactics and mental health. Several officers

mentioned role playing and scenario based training. One officer stated, "We are also taught to use this type of role playing, in our minds, to run scenarios and responses to help inoculate against being overwhelmed when things do occur." Some noted that action may be required even if there is no clear answer and that action looks better than inaction when the situation is viewed in hindsight such as it is during inquests.

4.2.2.2 Safety

The Safety category included assessing the scene for safety issues, i.e., upon arrival at the incident determine if there are any safety concerns such as risk of injury to anyone involved or the general public. There was variety in the order placed on who's safety should be considered first. Some stated the victim/complainant (if applicable), the general public, the officer, and then the suspect, while others put the officer's safety first. However, some respondents who put their safety as a priority consideration also went on to state that they have ignored their own safety when the risk to others is imminent and back up is not immediately available. Some of the comments were that it was part of the job.

4.2.2.3 Planning

The Planning category included using initially available information to decide an approach in advance of engaging in the situation. In some instances, officers receive information when dispatched and while traveling to a call, however, if an officer happens upon an on-view incident, this planning stage may not initially be possible. Officers suggested that it is important to begin to plan after receiving this information and before arriving. Even though many incidents will have time pressure, the importance of planning

was highlighted. When there is a lack of information or time to consider information, there must still be an attempt to act with good intentions. A number of respondents indicated they consider what a reasonable person would decide in their situation. There must also be a decision as to whether to request backup/assistance as part of this planning. However, as one officer cautioned, "most situations are different than what is reported or perceived before arriving. Things can change rapidly and having more than one course of actions prior to your arrival is best. Sometimes none of your options may work or be useful but at least you get your thought process working and get your head in the game."

4.2.2.4 Respite

The Respite category included attempts to gain more time for decision-making, i.e., once safety is addressed for the immediate situation, the next step is to see if there is a way to slow down the situation so as to allow more time for analysis. As one officer stated: "In the event I am faced with a situation requiring immediate action, my decision-making process often involves a quick analysis of what force is driving the situation, be it a person, conflict etc. In the event that I need to make a snap decision, I typically take action in order to temporarily stall or completely stop the drivers of a situation. This is typically done with the aim of creating respite or a pause so that I can have more time to analyze the situation."

4.2.2.5 Articulation

The Articulation category includes the consideration that after the situation officers must also be able to articulate why they acted as they did. As one officer noted, "There is usually very little time to apply a truly analytical approach to such situations

and it is easy to look back and identify 'errors' of process. There errors, however, are a result of the functional limits of our capacity to operate as human beings under stress." Looking back at errors was identified as a consideration when making decisions as scrutiny of the public, media, civilian oversight, and police service can be significant and can impact upon job security, thus sometimes dictating officers' actions. One officer indicated that this scrutiny may cause second guessing during situations and result in delayed reactions.

4.2.2.6 Summary

As some officers indicated, situations in policing are ever evolving so officers must adapt with the situation, which may result in officers moving back and forth amongst these categories. A set list of ordered actions does not appear to be feasible and indeed was not proposed by any respondents. Only 30 of the 95 responses included information from a single category. The remaining respondents included information from multiple categories (39 from two categories, 15 from three, and 9 from four). Two responses included information not applicable to the question.

The responses were reviewed in the chronological order in which they were entered in the online survey dataset. The 65th response was the last novel contribution for this question, the remaining 28 responses were repetitions of themes put forward by previous responders. It appears response saturation was achieved.

4.2.3 Section 2 Ranking Offence Categories

All of the 114 respondents provided rankings for 5 of the 6 offence categories, and 113 provided rankings for the sixth category, other federal statute violations. See Figure

4.1 for results (see Table H.1 in Appendix H for descriptive data). While the survey

questionnaire scale instructed respondents to rank the most challenging with a 1 to the

least challenging with a 6, the results are reverse graphed here so that the most

challenging shows as the highest point in the line and the least challenging as the lowest

point (the data table in Appendix H presents the descriptive data as scored by the

respondents).
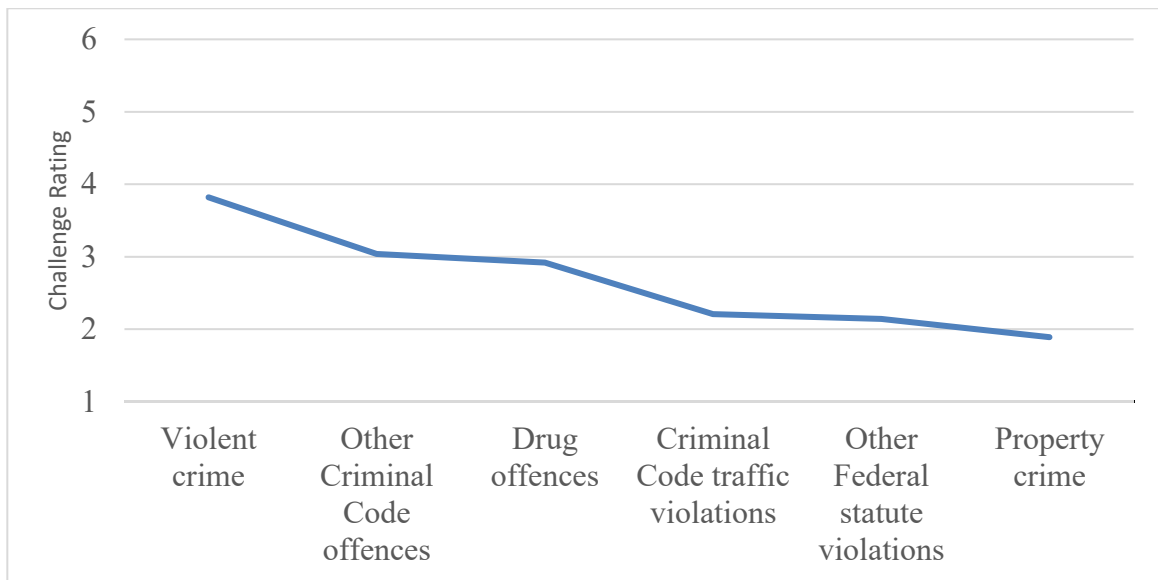
Figure 4.1: Challenge Level Ranking of Offence Categories

Violent crime was reported as the most challenging of the offence categories,

followed by other Criminal Code offences, drug offences, Criminal Code traffic

violations, other Federal statute violations, and lastly, property crime.

4.2.4 Section 3 Challenging Call Types

All of the 114 respondents provided rankings for the three challenging call type

statements. See Figure 4.2 for results (see Table H.2 in Appendix H for descriptive data).
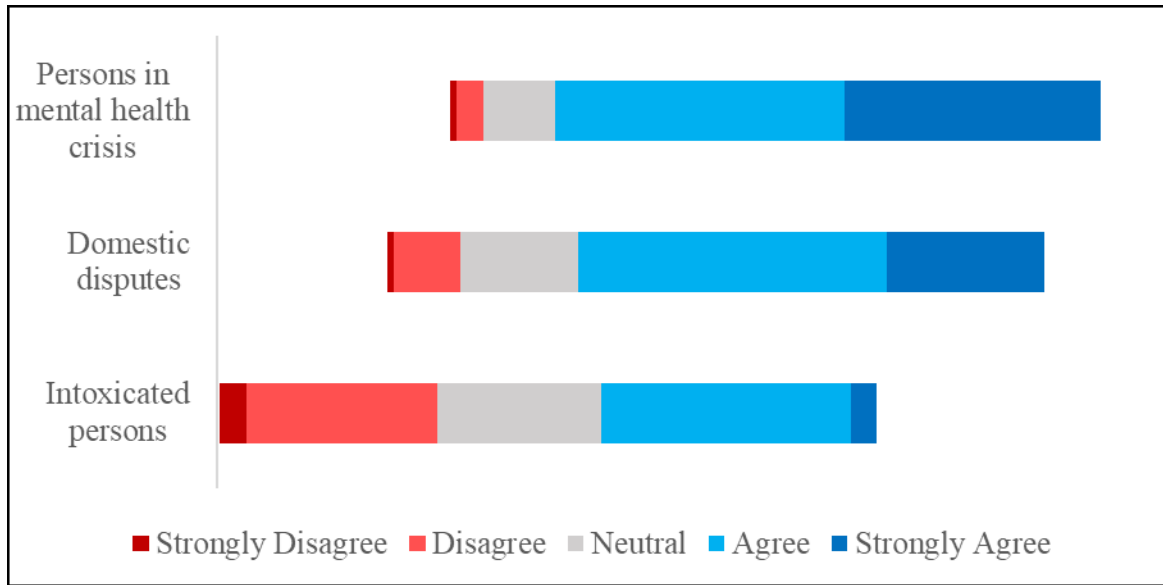
Figure 4.2: Levels of Agreement Regarding Challenge When Responding to Calls Involving Domestic Disputes, Intoxicated Persons, & Persons in Mental Health Crisis

For the purpose of presenting the results succinctly in the text, participants who chose either of the agree options (i.e., strongly agree or agree) were considered to have agreed with the statement and these percentages were combined. The two disagree options (i.e., strongly disagree or disagree) percentages were also combined. The results suggest that the respondents agree that responding to domestic dispute calls (71%) and calls involving persons in mental health crisis (83%) are challenging. Whereas, the statement regarding the challenges of responding to calls involving intoxicated persons received a more widespread reaction with 42% agreeing, 25% neutral, and 33% disagreeing.

4.2.4.1 New Categories of Challenging Call Types

Of the 114 respondents, 61 (54%) provided responses to the open-ended portion of this section. The categories of challenging call types experienced were almost as varied

as the responses received as were the explanations of what makes each of these incidents challenging for decision-making. This made categorising for quantitative analysis challenging. The following is an overview of the responses.

Of the 61 responses, 35 included mention of challenging categories of call types other than the three listed in the closed-ended question (domestic disputes, intoxicated persons, and persons in mental health crisis) and 55 included mention of characteristics that make incidents challenging for decision-making. The new categories and identified characteristics are provided below, with more detailed descriptions provided following the tables. The new categories of challenging call types (and the number and percentage of respondents who mentioned each) are provided in Table 4.2.

Table 4.2: New Categories of Challenging Call Types (Section 3)

New Categories of Challenging Call Types	Number of Respondents Who Mentioned Category	Percentage of the 35 Who Mentioned New Categories of Challenging Call Types
Crimes against persons	17	49%
Drug investigations of users & traffickers	5	14%
Missing persons	4	11%
Online activities	4	11%
Civil disobedience	3	9%
Impaired driving	3	9%
Sudden death investigations	3	9%
Child custody disputes	2	6%
Frauds	2	6%
Motor vehicle collisions with injuries	2	6%
Police corruption investigations	1	3%
Vehicle stops	1	3%
Vehicle pursuits	1	3%
Workplace investigations	1	3%

Twenty-three of the respondents included information from a single category. The remaining respondents included information from multiple categories (10 from two categories and 2 from three).

4.2.4.2 Challenging Characteristics

The challenging characteristics (and the number and percentage of respondents who mentioned each) are provided in Table 4.3.

Table 4.3: Categories of Challenging Characteristics (Section 3)

Categories of Challenging Characteristics	Number of Respondents Who Mentioned Category	Percentage of the 55 Who Mentioned Challenging Characteristics
Safety	42	76%
Legal complexity	39	71%
Lack of or conflicting information	16	29%
Expectations/perceptions	15	27%
Vulnerable victims	11	20%
Consequences for subjects & families	8	15%
Larger social issues	7	13%
Frequency (infrequent vs repetitive or habitual)	6	11%
Communication barriers	4	7%
Incidents involving youth	4	7%
Emotionally disturbing	3	5%
Large numbers of people involved	1	2%
Police service policies	1	2%
Poor decisions of colleagues	1	2%

Fourteen of the respondents included information from a single category. The remaining respondents included information from multiple categories (18 from two categories, 7 from three, 3 from four, 8 from five, 2 from six, 2 from seven, and 1 from nine). Two of the 61 responses included information not applicable to the question.

4.2.4.3 Descriptions of Challenging Categories and Characteristics

As the respondents did not separate the incidents from the characteristics in their responses, it is difficult to report the results in isolation. Isolating the results would also decrease the depth of information available. For these reasons, the incident and characteristic categories are described together with accompanying context. Various crimes against persons were highlighted, particularly abuse of vulnerable persons such as children, elderly, and women (specifically sexual assaults for this group). These incidents were viewed as challenging because of the complexity involved. Officers must be up to date on current legislation, case law, and investigative techniques such as those requiring judicial authorizations. The lack of cooperation from family members and witnesses was highlighted as one area of frustration for some cases. Calls involving children as victims (e.g., sexual and physical abuse, exploitation, luring, violence in schools, etc.) or parental custody disagreements were noted as challenging, especially for officers who are parents with one noting it led to over protectiveness with one's own children. Other officers noted that these crimes are emotionally disturbing and that they think of these cases for a long time afterward. Decisions made by officers in cases involving families will deeply affect all involved. Sudden death investigations can sometimes require officers to deal with family members as potential witnesses or even persons of interest while determining whether the death was the result of a crime or due to natural causes. Where there is the possibility of foul play, it is necessary to treat the case as a homicide until proven otherwise.

Incidents involving youth were viewed as challenging because the complainants often expect swift justice, but the requirements under the *Youth Criminal Justice Act* often lead to lengthy restorative processes. In a related response to dealing with youth, an officer highlighted the difficulty of dealing with youth from group homes, as these youth are often from broken homes or have been removed from homes because of behavioural issues. Some of these youth assault staff and disrupt and damage the home. Some youth frequently leave the home and must be treated as missing persons. These cases, and missing persons in general, were cited as being challenging due to lack of information and the sometimes habitual nature of the calls, which requires a large investment of time for the police.

Incidents involving online activity, including harassing communication, swatting, child pornography, cyberbullying, etc. were viewed as challenging as officers must quickly decide what information is important in order to preserve that evidence in this changeable environment. The need for quick decisions can be complicated by having to deal with service providers in our country and beyond. Large amounts of police resources are often required for these investigations. Even when evidence is procured, it may not be possible to prove the person who harassed, etc. was the account holder and not someone else who accessed their account or device.

Some incidents were noted as challenging due in part to their infrequent nature. Frequency is sometimes affected by population density or other aspects of a location, but can also be due to the type of incident, for example incidents involving special interest groups, bomb calls, and hostage takings. Some of these calls can have high risks

associated with decisions, and due to the low frequency officers often have minimal experience to call upon when making decisions. On the flip side of this are the frequent calls like building alarms that are often false. As one officer noted, it can be difficult to stay alert when so many of the alarms are false.

Robberies, barricaded persons, and other violent crimes in progress, especially where weapons are known or suspected to be involved, are challenging as the possibility of having to use lethal force can, as one officer stated, "lead to a rush of adrenaline prior to the arrival at a scene, which in turn makes controlling your physical, emotional and mental behavior that much more challenging." The high risks to safety of the officer, subject, and surrounding public associated with incorrect decisions were cited alongside some officers' concerns with public perception. Communicating in situations such as this is crucial and it is largely dependent on the subject with the weapon. Sometimes communication is not easily achieved. Officers must also decide which resources to request for backup based on little information.

Vehicle stops can also be dangerous. Sometimes an officer has information that the registered owner is flagged on a police database as violent, but in other instances no information is provided and as one officer stated, you "never know who or what you are approaching." Vehicle pursuits can also be challenging due to high speeds combined with the constantly evolving conditions and the required updating to supervisors during the situation. Motor vehicle collisions, especially fatalities or serious injuries, are challenging because there are times when an injured person needs to be held accountable for their

actions. Also, impaired driving causing death or grievous bodily harm investigations require a lot of steps governed by case law.

Drug investigations were noted by multiple respondents ranging from the changing approaches to marijuana, evidentiary burden in trafficking cases involving multiple persons, and the safety risks while executing drug and other types of search warrants. Sometimes wiretap investigations for drug and other types of offences may require notification of one of the targets with respect to their personal safety. Notification could compromise an expensive and lengthy investigation.

Investigations involving information obtained through confidential informants and Crime Stoppers require protection for sources and officers need to assess credibility and motives of the informants. Fraud cases are challenging as a number of *Criminal Code* offenses may apply and there may be many documents for analysis. Police corruption investigations may require officers to investigate friends or close colleagues.

Some incidents do not have effective resolution options. Responses with this complication referred to homelessness in cities without shelters and non-compliance issues such as those seen in Freemen on the Land occupations. Often officers are drawn into disputes where the police cannot resolve the situation to the satisfaction of the complainants, such as can be the case with landlord-tenant disputes. The resulting dissatisfaction can then lead to further arguments and altercations. Officers are also sometimes involved in workplace investigations where employees lose their jobs.

Civil disobedience incidents are challenging due to the large numbers of people involved. Officers need to consider that their decisions may incite violence. People may

be recording officers' actions and some people may be antagonizing the situation. Mob mentality may result in people doing things they would not usually do, e.g., Vancouver riots after the Stanley Cup final.

Some responses provided explanations of what makes the three listed incident categories (domestic disputes, intoxicated persons, and persons in mental health crisis) challenging for decision-making. Domestic disputes can be challenging as officers usually hear multiple, conflicting stories. Identifying the aggressor can sometimes be difficult. Sometimes neither of the parties are supportive of charges so they refuse to provide information. Some family disputes do not involve a criminal act, but advice is being sought, however the advice is not always accepted. The zero tolerance policies for domestic abuse can limit the responses of an officer where other responses might be more appropriate. For domestic disputes and persons in mental health crisis there can be years of history by the time police are involved. Officers find it difficult to capture this information through one conversation.

The co-occurrence of intoxication and a mental health crisis can be particularly challenging. These persons may not understand the response of the police and may not be able to take direction. It may also take a great deal of force to subdue persons influenced by certain drugs and in certain mental states. Four officers pointed to needed training and resources, such as having mental health workers attending calls with police. Frustration was voiced regarding police going to repetitive calls for the same people, as these people do not seem to be receiving adequate community support. As one officer stated, "Mental health crisis calls are by far the most stressful as they can often turn violent without

provocation. They are also stressful because police seem to be the catch-all and we often find ourselves dealing with mental health issues far outside of our training and expertise, only to be later criticized by family, the public or the media for how they were handled. These calls can often lead to officer-involved shootings."

As noted previously, some responses did not provide new categories of challenging incidents or link directly to the three listed categories, but provided general explanations of what makes incidents challenging for decision-making. The more serious the call, the more challenging the investigation as decisions are more likely to be scrutinized by supervisors and beyond. Handling scrutiny and requests from the media can be problematic, especially with questions that were not expected.

Multiple respondents referred to the unpredictable nature of witnesses and other persons of interest in investigations. For example, interviews can be very lengthy and challenging with high risk subjects. Balancing the *Charter of Rights and Freedoms* requirements and the need for confessions must occur to ensure admissibility of inculpatory statements. Communication can also be difficult due to age of person, mental health issues, disabilities, and language barriers. Specialized training and/or other resources may be required. Other officers may add to this unpredictability by making poor choices when dealing with conflicts. As one officer stated, "human behavior management is stressful and a tricky task to manage, especially early in the career." This can be compounded if an officer is not clear on the legal issues of the given incident.

Some responses were even more general and particularly illustrative of how challenges can occur in many facets of policing, not just those listed in the questionnaire

or provided by the respondents. Below are five direct quotes from officers that represent that theme.

"All of these calls have the potential to be challenging. But it's not so much the categories of incidents that determine the challenge of a particular call. It has more to do with whether the call is in-progress and what kind of resources the call will need. Also, the priority level assigned by dispatch affects the police response. A domestic dispute call can turn out to be nothing if everyone is cooperative with police. A high priority, resource intensive, in-progress call will typically involve the most difficult decision making."

"All domestics are different. All intoxicated persons are different. All mental heaths cases are different. Some people are cooperative. Others are not. Its not that the categories are difficult, its that the people you are dealing with can be difficult. They may not want your advice. They may not listen to you. They may not follow your instructions."

"Most calls/investigations involving risk management or liability impose the greatest stress on an officer. Some situations that are clearly defined in policy or practice may seem difficult on its face, however policy removes ambiguity and therefore stress."

"Every incident has the potential to be strongly challenging or absolutely not. Of course, certain situations are more prone to be challenging than others"

"Numerous calls have a variety of challenges. There is much to know, everything is reviewed under a microscope, and everyone has high expectations of how the police can help."

These responses were also reviewed in the chronological order in which they were entered in the online survey dataset. As mentioned at the beginning of this section, the vast majority of the responses were novel contributions, thus response saturation was not achieved for this question.

4.2.5 Section 4 Situational Characteristics

All of the 114 respondents provided rankings for 11 of the 15 situational characteristics statements. The other 4 statements had either 112 or 113 responses (as noted below). See Figure 4.3 for results (see Table H.3 in Appendix H for descriptive data).
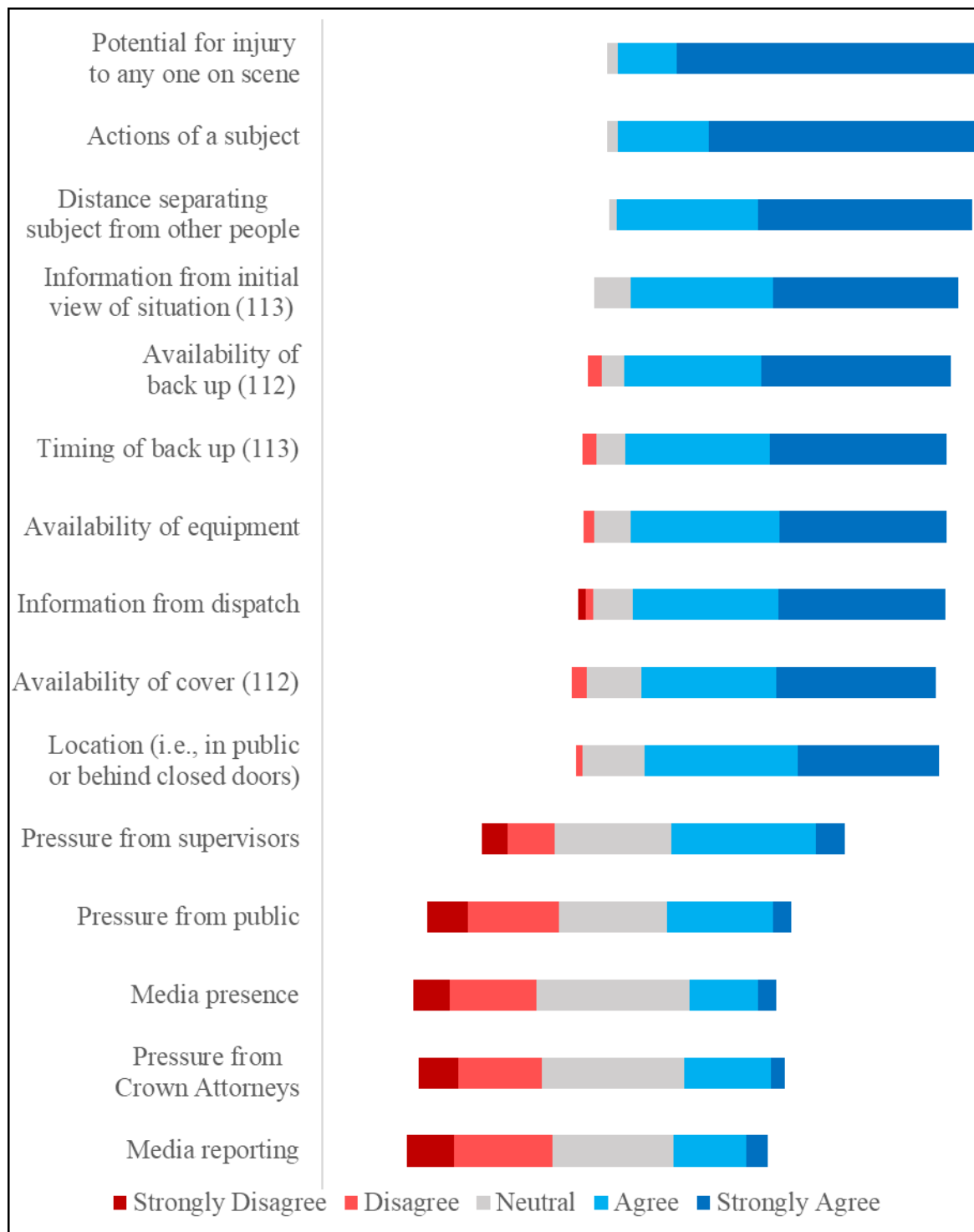
Figure 4.3: Situational Characteristics Levels of Agreement

For the purpose of presenting the results succinctly in the text, participants who chose either of the agree options (i.e., strongly agree or agree) were considered to have agreed with the statement and these percentages were combined. Most of the respondents agreed with 10 of the 15 statements, with the percentage of agreement ranging from 81 to 98 percent. Five statements did not achieve majority agreement: pressure from supervisors (48%), pressure from public (34%), media presence (24%), pressure from Crown Attorneys (28%), and media reporting (26%).

4.2.5.1 Elaboration on Situational Characteristics

Of the 114 participants, only 22 (19%) responded to the open-ended portion of this section. Thirteen respondents elaborated on 7 of the 15 provided statements. Consistent with the statement relating to information from initial view of a situation, two officers mentioned whether a crime is occurring should be considered. Establishing criminality would generally be one of the initial priorities on scene. One of these officers went on to specify that this is important because police officer authority stems from the *Criminal Code*.

The most referenced statement in this section relates to potential for injury. Safety, risk, and/or harm were explicitly cited in 9 of the comments. For example, one officer stated, "Officer Safety- again is extreme high priority. If we are not safe, we cannot protect the public."

The statement relating to pressure from supervisors was referenced by one officer who highlighted supervisors' emphasis on following policy as a result of "over scrutiny of the public." The statement relating to pressure from Crown Attorneys was referenced

by one officer who indicated that, "In my experience our relationships with the Crown are generally positive, and we are usually working together towards a common goal." The statement relating to pressure from the public and the two previously noted pressure statements were referenced by one officer who stated that these pressures "…are greatly amplified when time is an issue."

Some respondents explained why some of the characteristics, while needing to be considered, are not as important as other factors. The statements relating to media presence and reporting were referenced by three respondents. A response from one officer illustrates the general views expressed by all three, "Perception of Media and the public is a factor to consider, but cannot govern police action."

4.2.5.2 Additional Situational Characteristics

Thirteen additional situational characteristics were suggested by 15 officers, with some officers suggesting multiple additions. The categories of additional situational characteristics were almost as varied as the responses received as were the explanations of what makes each of these incidents challenging for decision-making, thus making categorisation for quantitative analysis challenging. The following is an overview of the responses.

Available time was addressed by five officers. One noted that there may be concerns with the time available to preserve evidence (e.g., is video equipment available to record evidence before the weather on scene causes contamination or loss). More generally, an officer noted that "Stress as it relates to time could be due to the seriousness or violence involved or it could be trial related (ie. Being careful not to infringe on

someone's rights by taking too long with any one step of an investigation)." Call load can also impact decisions if there are a lot of other priority calls in the queue versus having less time pressure.

Time was also noted in a different role, as in the time of day of an incident affecting officers' visibility at a scene. This additional situational characteristic, and 11 of the remaining 12, were addressed by one officer each. The presence of children was identified as a situational characteristic that will affect tactics in any type of situation. The amount of people at an incident was suggested by one officer as an additional situational characteristic for consideration. The trust and well-being of the general public was also suggested, which also ties in with a suggestion from another officer that, "In our policing environment the ethnicity of the persons involved is given priority in the media this had an impact on my decision making. Even though you would extend the same effort and options to people you encountered it was frustrating to be second guessed at the suggestion that your decisions were made because of race." In a related vein, diversity in police services was also suggested for consideration. Diversity is also related to the diversity of the communities and the need for language translators/interpreters as suggested by one officer.

Information technology for police use and the damage that can be done to an investigation via sensitive information being shared on social media were also suggested for consideration by one officer each. These and other considerations can sometimes be viewed by officers as having little to do with the job and more to do with outside factors. One officer also stated that, "Officers frequently say that most of the stress of being a

Police Officer has very little to do with the calls you take, and more to do with inner office politics and conflict with Supervisors/Co-workers. This is absolutely true." Concerns expressed by police associations that could impact labour relations were also highlighted by an officer as impacting situational characteristics.

One officer also suggested that the state of mind of an officer needs to be considered. Energy levels and emotional states vary and can influence decisions. For example, decisions made "at 4am on my second night shift are going to be different from my decisions an hour into my first day shift."

Two officers also stressed the importance of the need for continual reassessment. While not strictly a situational characteristic, it is a process that all officers need to practice. Constantly assessing risk and consequences during a high stress situation add to the officers' decision-making load and extend the process throughout as it becomes an iterative process instead of making a decision and moving on to the next issue.

These responses were also reviewed in the chronological order in which they were entered in the online survey dataset. As previously mentioned, the majority of the responses were novel contributions, thus response saturation was not achieved for this question.

4.2.6 Section 5 Decision-Making Techniques and Information

All of the 114 respondents provided rankings for 6 of the 13 decision-making techniques and information statements. The other 7 statements had either 112 or 113 responses (as noted below). See Figure 4.4 for results (see Table H.4 in Appendix H for descriptive data).
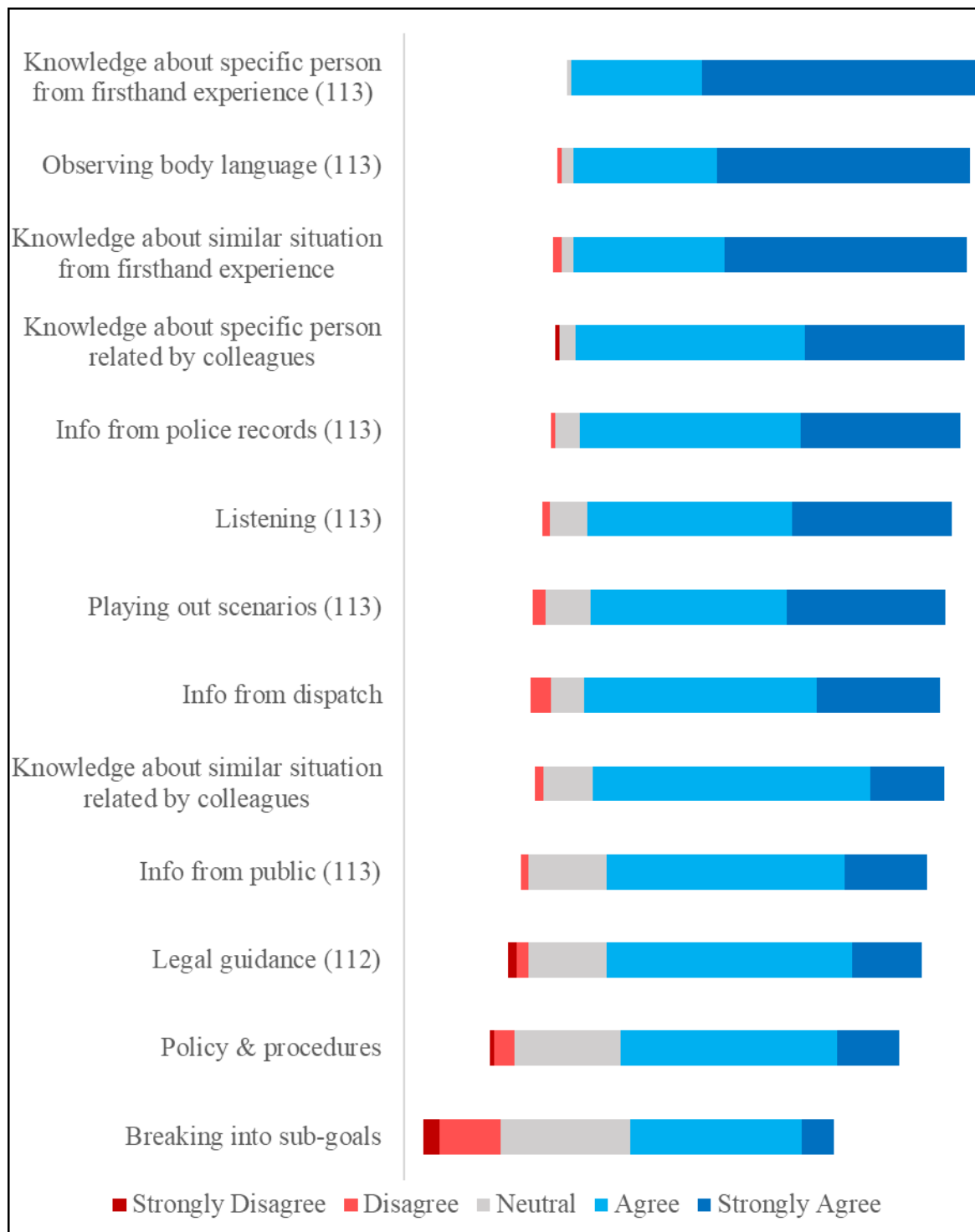
Figure 4.4: Decision-Making Techniques/Information Levels of Agreement

For the purpose of presenting the results succinctly in the text, participants who chose either of the agree options (i.e., strongly agree or agree) were considered to have agreed with the statement and these percentages were combined. Most of the respondents agreed with 12 of the 13 statements, with the percentage of agreement ranging from 68 to 99 percent. Only one statement, breaking the process into sub-goals, did not achieve majority agreement, as it only received 50 percent.

Of the 114 participants, only 19 (17%) responded to the open-ended portion of the section. Twelve respondents elaborated on 12 of the 13 provided statements. These responses are described below. Statement 9 (legal guidance) was the only statement not elaborated on by respondents in this section.

4.2.6.1 Breaking the Process into Sub-Goals

One officer stated the technique description of breaking the process into sub-goals was not helpful and the officer did not add any additional techniques beyond identifying that the only goals are "the protection of life and property and the apprehension of criminals." As stated above, this was the technique description statement which received the lowest level of agreement (50%).

4.2.6.2 Information, Knowledge, Listening, Observing, and Scenarios

Two officers commented on the statement relating to information from the public. One officer clarified that, "Reliable and truthful information is helpful. You can be provided all the information in the world, but if the person telling you is lying, then it is of no value. Deciphering between real and fake information is challenging. Especially in a tense situation with people you have never met before." The other officer suggested that

information recorded by the public could be identified through a canvass of an area where a crime has been committed and could be helpful.

One officer suggested that "Flagging indicators such as 'violent' or 'contagious' is great information prior to arriving on a scene." Subject information may be available in police records and through partnerships with other institutions. The information would most likely be passed along by dispatch, so the information from dispatch statement would also be represented in this comment. Subject information from police records received through a dispatcher could also be included with the next comment.

One officer simply commented, "History demeanor." These two words could encompass a lot of information. History potentially relates to the seven statements about information from dispatch, the public, and police records and knowledge about a specific person or similar situation gained from either firsthand previous experience or related by colleagues. Demeanor potentially relates to the two statements about listening to what is being said, including volume & voice cues and observing body language.

The most referenced statement in this section relates to knowledge about a similar situation gained from firsthand previous experience, this statement could cover comments from 9 of the officers. Three officers highlighted the time and effort it takes to develop experience and its importance. While acknowledging the importance of information in general, one officer stated, "It is very important to have as much information as possible. Information truly is power and those officers who are junior don't have experience to draw on so they depend on the role and help of other officers etc." This thus, also relates to the statements about knowledge related by colleagues. Another officer commented,

"Experience is obviously the biggest help when making decisions. It takes several years of Policing before most officers feel comfortable with all types of calls. The experience and the assistance of senior officers and street supervisors is frequently helpful." This same officer commented on the statement about playing out scenarios in your mind, stating, "that's something my Sgt frequently brings up in briefing. Not only is it helpful in making decisions, it's also helpful in preparing yourself mentally for stressful situations." Another officer commented that, "Simulations are helpful." This can also be interpreted as a combined endorsement of the statements about knowledge about a similar situation gained from firsthand previous experience and playing out scenarios in your mind. One officer suggested that, "Intuition is helpful. Sometime something just doesn't feel right. You can't say why, but you have a feeling about something or someone." Two other officers appeared to also be referring to intuition, but also understating the role of experience in developing it as they indicated the process was relatively simple. One suggested that common sense meant essentially "acting out of logic and not necessarily acting from emotion." Another officer stated, "Using Common Sense...If it looks like shit, and smells like shit....Chances are it probably is."

One officer combined aspects of multiple techniques, experience, and knowledge. The response included "time of day, location of incident, level of intoxication of parties." While no explanation was provided, it is conceivable that these could relate to the statements about listening to what is being said, including volume & voice cues and observing body language.

4.2.6.3 Policy and Procedures

Two officers took issue with the role of policy. One stated, "The biggest hurdle guys have to overcome is department policy. Guys are more concerned with not getting in trouble than anything else. I understand policy and procedures are there for a reason, but when they are brought up in a way by the executive to almost intimidate guys, it affects crucial decision-making ability in high stress situations. Its always in the back of guys heads." A second officer stated, "You do what you have to do in order to survive if that is the case. Worrying about the consequences or policy breaches can come later."

4.2.6.4 Additional Decision-Making Techniques and Information

Of the 19 responses, 6 officers made 5 novel suggestions for techniques, information, and knowledge officers find helpful during front line police decision-making. The following is an overview of the responses. Three officers noted the importance of guidance from others. One officer stated, "I think just getting a 2nd opinion helps sometimes, or even a 3rd." Two other officers suggested that assistance of senior officers and street supervisors is helpful. The remaining four novel suggestions were noted by one officer each.

An officer referred back to an answer provided for question 4, which included, "…constantly assessing risk and consequences for your actions. You need to ask yourself if the desired outcome is in reach? Will your decision making, get you there. All the elements and environment must be considered in your decision. If plan A doesn't work what is plan B." Another officer highlighted the importance of knowing those on your team, as "Sometimes a member of your own team is a game changer by over or under

reacting adding even more stress to a situation. When I worked with a few members, I was always wary of a worsening potential because of their attitudes and actions." The environment and the potential of other people becoming involved was highlighted as a concern for another officer. One officer provided a detailed description and example of, "Planning in reverse." This tactical method was described as starting with deciding the end goal, then working backwards in the scenario. Within this description, the officer also highlighted three "keys to patrol critical incidents: Priorities of life, Intelligence, Environment." The process was described as, "always starts with the priorities of life and is constantly being assessed. The intel and environment are assessed if they change."

These responses were also reviewed in the chronological order in which they were entered in the online survey dataset. The majority of the responses were novel contributions thus response saturation was not achieved for this question.

4.2.7 Section 6a Training

Of the 114 respondents, 84 (74%) provided a response to the question on techniques or information they use in their frontline decision-making that they learned through training. By combining the information provided, a composite of techniques and information officers have learned through training to use in their frontline decision-making emerges. These can be divided into seven categories. The categories (and the number and percentage of respondents who mentioned each) are provided in Table 4.4, with descriptions following the table.

Table 4.4: Techniques/Information Learned through Training (Section 6a)

Decision-Making Techniques/Information Learned through Training	Number of Respondents Who Mentioned Category	Percentage of the 84 Who Provided Responses
Physical skills	53	63%
Communication skills	45	54%
Information usage	24	29%
Decision tools	21	25%
Written direction	15	18%
Behavioural understanding	9	11%
Other skills	9	11%

4.2.7.1 Physical Skills

Physical skills were described in a multitude of ways, including: use of force, reasonable officer response, one plus one doctrine, disparity of size, physical skills of the subject like martial arts training, firearms, control tactics, self-defence (blading of body, safe distance, martial arts), active/mass shooters, immediate rapid deployment, muscle memory, number of officers, situational awareness (one officer noted accident investigation helped with this), threat cues, environmental hazards, watch the hands, have a second escape route, safety, response to domestic calls (ambush possibilities), geography, perimeters, equipment, approach (stealth or siren), tactical breathing, being calm, vehicle operations, and vigilance. One officer noted, "My actions are based on your actions. I'm not in the business of fighting. My actions are larger, more serious, and more severe than yours." A caveat for this category is that "use of force" training while dealing with a lot of physical skills, usually also overlaps with some of the other categories. Where officers only mentioned use of force, the response was categorised as physical skills, while any other details were categorised separately.

4.2.7.2 Communication Skills

Communication skills included: active listening, de-escalation, verbal commands, verbal judo, mediation (one officer noted that this training was completed on own initiative as it was not offered by the police service), verbal codes to communicate with other officers and forewarn them of potential trouble, impartial and objective assessment of the situation rather than any biased on unsubstantiated information, observation of verbal and physical cues, interviews, separate witnesses, written pure version statements, interviewing children, and hostage negotiation. As one officer stated, "…many of the situations that people find themselves in that require the police are result when they fail to consider the impact of their actions on others. Sometimes conversation to help them shift their perspective to see it from someone else's perspective is instructive." Another type of communication skills was highlighted by another officer, "discussing the call afterwards and different ways it could have played out and what the reaction would have been and how it could have been different in slightly different situations."

4.2.7.3 Information Usage

Information usage was described by providing a variety of sources of information, including: databases (e.g., Canadian Police Information Centre), dispatch, other officers, supervisors, nature of the call, and history of persons (e.g., run license plate before exiting vehicle at a traffic stop).

4.2.7.4 Decision Tools

Decision tools included: decision trees, planning, scenario based, visualization, disengage to give time to assess, and re-assess. Four officers referenced not rushing,

"buying time" or "stepping back" to give yourself more time to think. For example, one officer stated, "In most cases time is on our side and there is no need to make a quick decision. Keeping a safe distance and gathering as much information as possible helps to develop some confidence in a final decision. Having more police presence and communicating strategies among peers helps to find the best decision. For those cases where there are seconds to make a decision you just have to fall back on your training. An officer needs to take their studies and training seriously so they are confident in how they will likely respond when under stress. No one really knows for sure though until it actually happens." Buying time was suggested by one officer who also went on to caution to "never resort to complacency."

4.2.7.5 Written Direction

Written direction included sources such as: legislation, case law, reasonable grounds, and policies. Police officers study these materials during their training, receive ongoing training throughout their careers, and are expected to keep up to date with changes to these documents through reviewing information circulated within their police service. Some of the information is accessible during incidents, but in most cases, time, location, and practicalities do not allow officers to review the information when it is relevant. Most of the information must be learned before it is needed and recalled for use without aid of access to the documents.

4.2.7.6 Behavioural Understanding

Behavioural understanding included: mental health, crisis intervention, psychology, transactional analysis, human behaviour, cultural, gender, religious and other

influences and perspectives as motivation for thinking and actions, presence of children, domestic violence cycle of abuse model, and sexual assault.

Some of this training may have been acquired during post-secondary courses, but most would be organized by police services. In many cases police services partner with community agencies to provide training to their officers. Subject matter experts, advocates, victims, and others affected by crime are brought in to help officers understand the causes and outcomes for some of the behaviours they will encounter while conducting their duties. The hope is to sensitize officers to issues in the community that will help them deal more effectively and humanely with those exhibiting behaviours which are causing the issues which lead to police involvement (researcher's professional observation).

4.2.7.7 Other Skills

Skills other than those listed above, included: investigation, preservation of evidence, incident command, advanced patrol, leadership, generational leadership, online, video learning, coach officer, and on both sides (field training).

4.2.7.8 Summary

Some responses from officers were indicative of multiple step processes they use from their training. For example, one officer referred to, "A modification of the STAR technique for approaching an event: situation info (type of call), threats (weapons), action (what to do to deal with that initial situation), re-assess. This is done throughout the event." Another officer stated, "I use a combination of experience and knowledge to make most of my decisions. These would be compensated with information about a specific

call, first hand experience or experiences from other officers. I would also run through variations of the response and evaluate the anticipated outcome. This would take into account both legal and policy driven outcomes ensuring the outcome fits within the policy and legal parameters." One bilingual officer referred to doing the "METERI (MENACE, ESPACE, TIME, ENJEU, RESSOURCES, INFORMATION PERTINENTE." Another officer noted, "Training is a Toolbox that provides a tools which can be used...Each situation does not call for the same tool even if on the outside a situation appears identical...People are dynamic and Training provides a framework within which each officer must work...It is entirely based on the individual observations of each officer (qualitative) which tool is required...This is not something that can be trained it is learned over time and is as unique to each officer as each situation that is dealt with."

One officer stated, "Feel you don't learn it through training either you have it or don't." While another stated, "there are several manuals that outline police training and its merits. For me to verbosely describe these techniques would be an outrageous waste of time." These extreme ends of the continuum of perceived innate ability or overwhelming myriad of training required were not represented in the majority of comments. Most officers indicated at least one or up to five of the categories they have learned through training for frontline police decision-making.

Twenty-five of the respondents included information from a single category. The remaining 56 respondents included information from multiple categories (27 from two categories, 21 from three, 6 from four, and 2 from five). Two of the 84 responses included information about experience instead of training and the information was thus considered

in the next section. One response indicated that all frontline decision-making techniques and information are initially learned through training, without providing any specifics.

These responses were also reviewed in the chronological order in which they were entered in the online survey dataset. As is evidenced by the categorisation of responses, there were repetitions of themes put forward by previous responders. However, novel contributions were found throughout the data, thus response saturation was not achieved for this question.

4.2.8 Section 6b Experience

Of the 114 respondents, 78 (68%) provided a response to the question on techniques or information they use in their frontline decision-making that they learned through experience. By combining the information provided, a composite of techniques and information officers have learned through experience to use in their frontline decision-making emerges. These can be divided into six categories. The categories (and the number and percentage of respondents who mentioned each) are provided in Table 4.5, with descriptions following the table.

Table 4.5: Techniques/Information Learned through Experience (Section 6b)

Decision-Making Techniques/Information Learned through Experience	Number of Respondents Who Mentioned Category	Percentage of the 78 Who Provided Responses
Communications	49	63%
Learning from mistakes & successes	37	47%
Physical presence	31	40%
Reserving judgment, emotions in check, not rushing	25	32%
Partners, backup, knowing your limits	15	19%
Guidance from experienced officers	13	17%

4.2.8.1 Communications

Communications included: dispatch information, database checks, asking questions, active listening, listening to all sides, interviews, rapport building, being respectful but firm, being honest, not making promises, de-escalation, interpersonal skills, giving clear instructions, and getting to know your diverse community. Several officers stressed the importance of experience in learning to diffuse and de-escalate situations. Treating people with respect and listening to them usually calms the situation. Separating parties also helps with communication, instead of refereeing arguments. One officer noted that, "some persons are unable be it past experience or being under the influence of an intoxicant are unable to hear or comprehend your role in helping them. There are times when no amount of talk is going to change the situation and sadly force must be applied." Another officer advised, "Not everyone who police deal with are able to articulate their needs." The role of positive and negative experiences in learning communications techniques was highlighted by one officer who stated, "Talking to people. It's a technique that is learned by doing or doing wrong."

Multiple officers noted that dispatch and other information is not always accurate. Complainants and witnesses may provide false information either intentionally or unintentionally, and dispatchers may not have enough information so assumptions may be made. Biases can creep into information through a multitude of sources, including other officers.

4.2.8.2 Learning from Mistakes and Successes

Learning from mistakes and successes deals with personal experience. As one officer stated, "Personal experience is probably the best learning that is available throughout your career. decisions that you make, even bad ones are valuable learning tools if you are able to accept that sometimes you are wrong and learn from it." Another stated, "Despite good training and other observations by members I have found that in the end your own experience weighs most heavily on your decision making. As people we sometimes have to make our own mistakes to learn. More experience, through time on the job, or exposure to more situations, (as in a busy environment) leads to better decision making." Some officers compared prior education and training to experience and stressed how important personal experience is to their decision-making. Some officers pointed to the repetitive tasks and the credibility and confidence gained through mastering each task. The observation was made that, "Officers with more experience often make very different decisions than new officers. I rely on my past experiences to tell me what was successful and what wasn't. If something didn't work well for me during a similiar situation, I'm not likely to try it again, even if it was taught in training." Accessing memories to make quick and safe decisions was noted as an important tool.

Also included in this category were suggestions from officers who recognized, through experience, the benefits of following procedures from service policy and legislation, such as extensive note taking, clear report writing, and proper form, warrant and production order completion. One officer did provide a note of caution regarding experience and policy, "With public safety, policies and procedures can be regarded as

guidelines of what to do in a perfect world, ideal situation. The reality is that the world is not perfect, no situation is the same, and what worked 100 times in the past may not work the 101st time."

4.2.8.3 Physical Presence

Physical presence included: approach techniques, safe distance, tactical positioning, ready hands, awareness of all movement/body language, physical factors of subject (e.g., alcohol and/or drug intoxication), awareness of surroundings, knowing multiple escape routes, breathing techniques, recognizing signs and effects of stress and adrenaline. Officers suggested ways to manage these effects, such as, "Walking fast instead of running to my police vehicle if I need it to respond to a call. This helps keep my heart rate down which helps keep me calm." And, "Walk, don't run. Reduce your speed as you get closer as to allow you to absorb more visually. We get a lot of verbal information but, initial visual can be critical to survival and success."

4.2.8.4 Reserving Judgment, Keeping Emotions in Check, and Not Rushing

Reserving judgment, keeping emotions in check, and not rushing included: be objective, avoid making judgements until all available information is gathered, keep emotions in check, do not rush decisions, think of the totality of circumstance, remain calm, be patient, never resort to complacency, consider if you have discretionary time, and assess the urgency. One officer noted, "police officier are sometimes emergency makers. We need to step back when life or people security is not compromise." Whereas another officer stated, "It is better to make a so-so decision at the right time that the right

decision when its too late. You will never have all the information you need to make an informed decision."

4.2.8.5 Partners, Backup, and Knowing Your Limits

Partners, backup, and knowing your limits included: use coworkers to assist on calls, contact needed resources, advise supervisor of needs, communicate with coworkers and supervisors, and know location and distance for back up units. One officer stressed the safety benefits of working with a partner. Assessing what you should do alone was highlighted by another officer, "Don't get to deep into something you have no control over, and have no back up plan. Assess every serious situation and take only the appropriate action within your ability. Critical thinking and decision making in some situations have irreversible outcomes." The importance of knowing when to retreat or reposition was also highlighted, "If required knowing when to back out of a situation until back can arrive while being able to contain subject."

4.2.8.6 Guidance from Experienced Officers

Guidance from experienced officers included: observations, coworkers' stories, supervisors' guidance, and debriefing. One officer stated, "Good supervision and debriefing of important calls/decisions, after the fact, and getting the reasons behind the decisions from others is another good way to understand the 'why' of decision making of others and being able to incorporate their decisions and reasoning into your own."

4.2.8.7 Summary

Common sense was noted in responses by a few officers. One noted it was part of the skill set required and another noted it develops over time alongside other abilities such as situational awareness and perception.

Some direct quotes from officers will help to provide general context. One officer stated, "Things you learn through training are confirmed, enhanced and built on by your experiences on the street." Another suggested, "Try to be prepared for the unexpected, by being able to see any potential possibility of the situation going wrong. Read body language of the people that are being dealt with. When making an arrest take care in the handling of the suspect and be aware of the possibility of being video recorded." Advice from another officer included, "Ask questions and wait for the answers. Don't jump to conclusions. Accept thought and guidance from all areas. Once you think you can do it all with nobody's help is the time you will probably make a mistake. A/n being said - the more experience you have the better chances you have to make a strong/sound decisions."

Twenty-four of the respondents included information from a single category. The remaining respondents included information from multiple categories (28 from two categories, 19 from three, 4 from four, 1 from five, and 2 from six).

These responses were also reviewed in the chronological order in which they were entered in the online survey dataset. As is evidenced by the categorisation of responses, there were repetitions of themes put forward by previous responders. However, novel contributions were found throughout the data, thus response saturation was not achieved for this question.

4.2.9 Section 6c Suggestions

Of the 114 respondents, 81 (71%) provided a response to the request for suggestions on how to improve the preparation of officers for decision-making in the field. Seven categories of suggestions were repeated by multiple respondents. The categories (and the number and percentage of respondents who mentioned each) are provided in Table 4.6, with descriptions following the table.

Table 4.6: Suggestions to Improve Preparation for Decision-Making (Section 6c)

Suggestions to Improve Preparation of Police Officers for Decision-Making	Number of Respondents Who Mentioned Category	Percentage of the 81 Who Provided Responses
Scenario training	29	36%
Coach officers, mentoring, other on job training	26	32%
Communication training	14	17%
Importance of ongoing regular training	13	16%
Academic studies & legal knowledge	9	11%
Two-officer vehicles	6	7%
Onus on officers	4	5%

4.2.9.1 Scenario Training

Scenario training included using situation based exercises and role playing. Scenarios ranging from every-day situations to less frequent high pressure, time intensive decisions should be created, based on actual incidents that have affected officers in the line of duty. These should contain diverse circumstances with changing variables. Feedback should be given immediately and after the fact through debriefing, discussion, and peer review. Officers should receive opportunities and be encouraged to ask questions and try again, to build on the feedback. Some officers noted that this type of training may take more time, but as one officer stated, it "gives them a foundation of

experience to draw upon." Creating a safe environment for scenarios does not fully replicate the real thing, but it is as close as can be accomplished in a training environment. It provides an opportunity to safely learn from mistakes and errors. There was acknowledgement that some of this type of training is currently done, but more is needed. One officer also suggested that senior officers talking about scenarios they have experienced and what has worked and what has not worked for them could be another useful method of scenario training. Some officers suggested experienced officers should have more input in recruit training.

4.2.9.2 Coach Officers, Mentoring, and Other on Job Training

This category included Coach officers, mentoring, and other forms of on the job training. Some officers felt this was the best way to prepare recruits for decision-making. Choosing the right coach officers was highlighted by several officers. The coach officers need to have good decision-making skills. That does not necessarily mean someone who is very senior, but "the ability to see the big picture and able to work through a complex situation and visualize the end result" was suggested as necessary by one officer. Another officer suggested having a main coach officer, but also pairing recruits with other officers from time to time to give recruits more options to choose when deciding what approaches work best for them. One officer stated that, "the reward/stress of field training does not balance, in the slightest. As such, people who would be great at the job, refuse to do it, leaving individuals who are NOT great leaders/instructors to do the job." Another officer suggested increasing diversity to increase cultural and language knowledge and resources. More time with coach officers and supervisors was suggested by some officers. Other

officers suggested that there should be some changes in the approaches of coach officers. For example, coach officers need to move beyond telling their recruits how to handle a call to explaining the reasons (*Criminal Code*, case law, experience, etc.) it should be handled that way. Knowing the reasons will help the recruits understand the process and why they are doing what they are doing, which can help when they present evidence in court. Providing a structured methodology for the coach officer to follow was also suggested. One officer stated rather succinctly that, "The best way is to learn it by doing it. As the saying goes, 'seeing is believing', and some of this stuff you can't believe until you see it."

Also included in this category, time observing in court was suggested by one officer. Learning the court process, hearing experienced officers testify, and hearing questions from defence counsel will help prepare them for what they need to do from the beginning of a file throughout and up to and including testifying. In a similar vein, one officer suggested including internship opportunities, instead of more education. Working rotations in a criminal investigation division was suggested by another officer. Rotations could be at the beginning and periodically throughout their careers to help them understand how to handle more complex investigations from the beginning in their role as patrol officers. In a related vein, file review was suggested by 3 officers. Example cases can be used to demonstrate and describe the steps taken in the investigations. Showing them proper and improper ways to handle files can help them recognize potential errors and how to avoid those errors. One example suggested was impaired driving cases. These cases involve a large quantity of case-law and legislation which can result in complex

situations. Some officers suggested that decision-making may not be able to be taught, but is gained by experience.

4.2.9.3 Communication Training

Communication training suggestions took various forms from treating people with respect and active listening to de-escalation techniques and specialized communications training for dealing with people in mental health crisis. One officer also cautioned to not automatically believe what people tell you. The suggestion was to take in all the information and then once you have all the information to challenge statements to get to the full truth.

4.2.9.4 Importance of Ongoing Regular Training

Importance of ongoing regular training to help keep officers up to date with changing legislation and case law was suggested. One officer stated, "The academy is an overwhelming amount of information and there is no experience to make it all applicable right away." Two officers stated that knowledge is power. Knowledge can begin with education and training and experience can add to that knowledge. One officer suggested that a standardized course curriculum and training model would be helpful.

4.2.9.5 Academic Studies and Legal Knowledge

Academic studies and legal knowledge were suggested as being important to give members the confidence to make sound decisions. A "psychology degree or at least some psychology courses to understand how people think and respond" was suggested by one officer. Also, experience in sales or the service industry was seen as potentially helpful in understanding how to motivate people.

4.2.9.6 Two-Officer Vehicles

Two-officer vehicles were suggested for the following potential benefits: extra ears and eyes to gather information, two officers to separate the parties and get the story from each, learning from each other, team approach, bringing multiple perspectives and experience, and improving officer safety. In a related response, one officer suggested that officers should not see requesting a backup unit as a sign of weakness, instead view the presence of another officer as useful in making a subject reconsider resisting arrest and in maintaining control if a subject resists arrest. Having a witness can help if a complaint is lodged against an officer.

4.2.9.7 Onus on Officers

Onus on officers to prepare themselves for decision-making included: education, asking questions, listening to those who know the topic, reading available information, and being prepared for each incident, including changing events. One officer expressed concern that applicants to police services are unaware of the overall job and misinformed by what they see or hear from television shows and movies. This officer suggests all applicants should read accurate books on the profession and volunteer their time to get experience through reserves and ride-alongs. More accurate information would lead to a better understanding of the job requirements and the effects on officers' family members.

4.2.9.8 Summary

Some suggestions were repeated by only two respondents, or provided by a single respondent. These comments did not fit any of the other categories and were not able to be combined with others to form additional categories. They are reported here to ensure

complete representation of the data provided. Two officers suggested that processes within police services should change. One suggested empowering officers to make decisions and providing positive reinforcement by supervisors when officers make timely and correct decisions. Another suggested changing the promotional system to ensure good leaders are promoted. One officer suggested that physical fitness helps to keep officers alert, which helps with decision-making. Another officer suggested that training in mental toughness and self-care, combined with being put in stressful situations during training can help officers experience challenges and increase their confidence that they can overcome challenges and achieve goals.

Pearls of wisdom were also included by multiple officers. These were pieces of advice that did not speak to specific training, but were general suggestions for new officers. For example, stay calm and breathe, think things through, be patient, etc. Policy was viewed by one officer as a starting point, but that officers should be told other approaches can be used as long as these are within reason, can be explained, and fit the legal requirements. Officers need to be aware that most of their decisions affect families, e.g., charges laid in domestic disturbances, so it is important to investigate fully before drawing conclusions. Another officer, however, cautioned that "You will never have all the information you need to make an informed decision." One officer suggested that you should not feel "like you have to know everything or have all the answers when helping people." That officer also suggested that you do not need to rush when dealing with people. Some officers suggested priorities, such as making the scene as safe as possible for everyone before addressing the issue. Also, one officer suggested applying "the

priority of life": first public/victims, second police officer(s), and third suspect/subject. The suggestion was that this would help officers "survive legally, mentally and physically."

Some officers made general comments that did not provide suggestions or recommendations, but recognized the difficulty and importance of preparing officers to make decisions. Two officers indicated that decision-making skills are hard to teach. The need for common sense was highlighted by two officers. Building instinct was recognized as well by one of these officers. According to one officer, intelligent people with diverse backgrounds will be good decision makers, provided they get adequate amounts of sleep. One officer suggested that decision-making ability is a pre-requisite of the job and that time, experience, and repetition will further improve decision-making.

A note of caution from one officer helped to put all the suggestions into context, "every decision is different and every person is different and all react different so you can have all the training in the world and you can have one situation that throws all your training and educational backgrounds out the window."

These responses were also reviewed in the chronological order in which they were entered in the online survey dataset. As is evidenced by the categorisation of responses, there were repetitions of themes put forward by previous responders. However, novel contributions were found throughout the data, thus response saturation was not achieved for this question.

4.3 Conclusion

The survey utilized a questionnaire constructed from information from the literature review and the results of the Critical Incident Analysis interviews conducted during the first phases of this research. This layered, mixed methods approach allows for the building of rich and descriptive information. While the verbal and written responses of the participants provide information, so does their response patterns to the various questions. The following is a brief description of the response rates for the questionnaire sections, and some suggestions as to what we may be able to gain from interpretation of the resulting patterns.

4.3.1 Section 1 Decision-Making Description

The response rate was 83% for this section. This was the only question for which response saturation was achieved. No scale questions were included prior to this, so as to allow the participants an initial opportunity to provide responses which would not be influenced by the results from the interviews. Seventeen percent of participants did not respond to the request to describe how they would typically make a decision in a frontline policing, ambiguous, time-pressured, and consequential situation. Interpreting a non-response is difficult, but two potential reasons could be that they were not motivated enough to provide, or could not articulate their decision-making process. As these participants self-selected to complete the survey, motivation may not have been the primary hurdle. Most (78%) of the participants who did respond included information from multiple categories, indicating the complexity of the process.

4.3.2 Section 2 Ranking Offence Categories

The response rate for 5 of the 6 categories was 100%, and 99% for the sixth category. No open-ended question was included in this section, as this was an inclusive list of offence categories. As can be seen in Figure 4.5, there was a notable divergence when comparing challenge level ranking with reported national occurrence percentages.
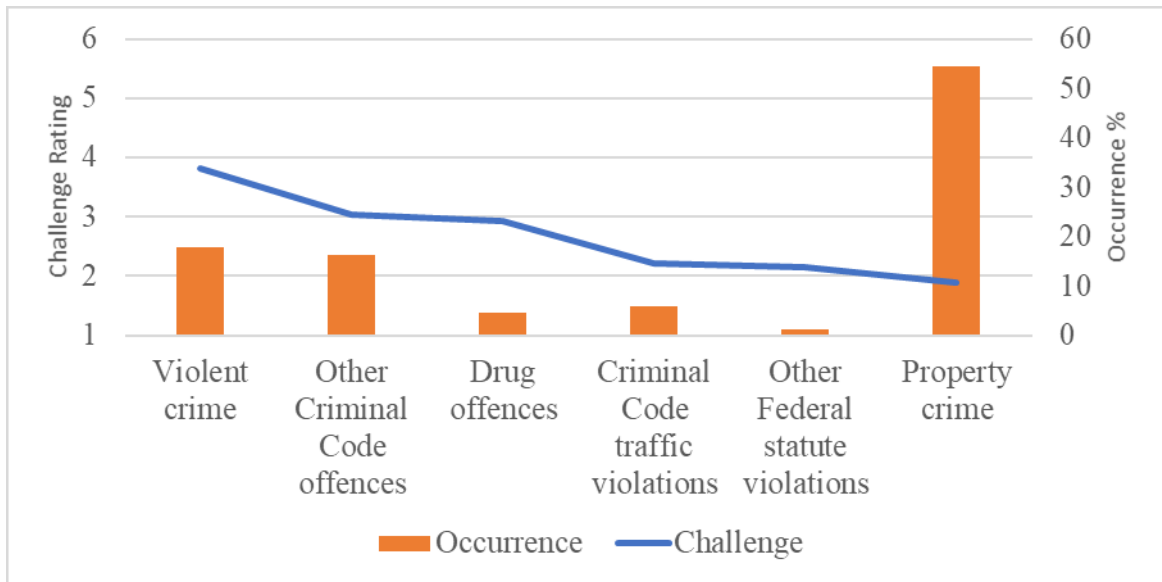

Figure 4.5: Challenge Level Ranking and Occurrence Percentages of Offence Categories

The police-reported crime for selected offences in Canada in 2016 (Keighley, 2017) shows that of the 2,142,545 violations reported to police the percentages in descending order were: property crime, violent crime, other Criminal Code offences, Criminal Code traffic violations, drug offences, and other Federal statute violations. While being the most prevalent, property crime was reported as the least challenging. Nothing can be said with certainty as to the reasons for this difference, but three main possibilities come to mind.

The more prevalent a crime is, the more often it is dealt with allowing officers to potentially develop a level of comfort through increased experience with the type of crime. However, violent crime is the second most prevalent, but it was reported as the most challenging. If the possible reason of comfort through experience adequately prepared officers to deal with a category of offences, then violent crime should not be viewed as the most challenging. Obviously, there is much more to learning to deal with crimes, especially those involving endangering lives, than just frequency. When people's safety is concerned, another layer of complexity is present.

The second possible reason for the divergence could be regarding the severity of the crimes. Property crime is often viewed as less serious than crimes against persons, of which violent crimes is an important subcategory. Society takes more of an interest in violent crimes and thus there may be more pressure on officers to correctly deal with these offences. However, as was reported in the priority of consideration of situational characteristics results, only the statements referring to immediate, in the moment, concerns received high (80% and above) levels of agreement. The five categories which dealt with external parties, such as supervisors, the public, Crown Attorneys, and the media, had less than 50% agreement, thus putting doubt on severity of the crimes as a potential reason. Those categories dealt with external parties, but none dealt with the individuals involved directly in and impacted by the crimes. Again, the safety of the people involved is part of the extra layer of complexity.

The third potential reason could relate to the immediate social context of the situation. The most often cited categories from the initial question on describing their

decision-making were information and safety. These directly relate to the immediate social context. As discussed in the literature review, Zimmerman's (2006) approach of using NDM interactions including people resulted in participants sometimes aiming to manipulate the thought processes of the subject, pointing to use of information and a concern for safety. This third reason appears to be more explanatory than either of the two explored above, and the safety of those involved is a key aspect of this. Social context appears to play a large role in determining complexity.

4.3.3 Section 3 Challenging Call Types

The response rate for all three statements was 100%. Two of the three statements received majority agreement, but the third received a mixed response. The open-ended portion of this section had a 54% response rate. The categories of challenging incidents and the explanations of what makes each of these incidents challenging for decision-making were so varied, categorisation for quantitative analysis was challenging. Beyond agreeing that responding to calls involving persons in mental health crisis and domestic disputes is challenging, there was little that was consistent in the responses for this section. What this may tell us is that there are so many potential variables to consider when weighing complexity of calls and making decisions, that any approach to improving decision-making will need to be very flexible.

4.3.4 Section 4 Situational Characteristics

The response rate was 100% for 11 of the 15 statements and 98-99% for the other 4 statements. The open-ended portion of this section had a 19% response rate. Once the responses are reviewed, it becomes apparent that only 11% of the respondents suggest

additional situational characteristics (the other 8% were elaborating on provided statements). However, a low response rate to an open-ended question when combined with a layered approach is a positive result. In this case, it is an indication that the approach of beginning with subject matter knowledge in the design of the semi-structured interview guide combined with the results from the interviews for the design of the scale questions for the survey resulted in an inclusive list of the majority of the situational characteristics respondents feel need to be considered during front line police decision-making.

4.3.5 Section 5 Decision-Making Techniques and Information

The response rate was 100% for 6 of the 13 statements and 98-99% for the other 7 statements. The open-ended portion of this section had a 17% response rate. Once the responses are reviewed, it becomes apparent that only 5% of the respondents suggest additional techniques, information, and knowledge (the other 12% were elaborating on provided statements). However, as discussed above, a low response rate to the open-ended question, when combined with a layered approach, could potentially indicate that the majority of respondents felt the list of statements provided adequately addressed the techniques, information, and knowledge officers find helpful during front line police decision-making.

4.3.6 Section 6 Training, Experience, and Suggestions

This section did not include any ranking or agreement scales, only a series of three open-ended questions which gave participants expanded opportunities to provide general input about frontline police decision-making. The first question about techniques or

information they use in their frontline decision-making they learned through training had

a 74% response rate. The second question about techniques or information they use in

their frontline decision-making they learned through experience had a 69% response rate.

The third, which was an opportunity to provide suggestions on how to improve the

preparation of officers for decision-making in the field, had a 71% response rate.

4.3.7 Response Rate Patterns

Not surprisingly, the ranking and scale questions had higher response rates (98-

100%) than the more time consuming and cognitively demanding open-ended questions

(17-83%). However, the open-ended response rates also followed an anticipated pattern,

in that the initial question had the highest (83%) response rate, the final open-ended

questions had lower response rates (69-74%) and the sections in between where

statements were provided prior to the open-ended requests for additional categories had

the lowest response rates (17-54%). The challenging call types identified in the interviews

and provided in the survey did not come close to matching the potential variables

provided by survey participants for consideration when weighing complexity of calls for

decision-making. Given the widespread variety of the responses for this section of the

survey, it is unclear if enough interviews could have been conducted to adequately cover

the range of responses, but more interviews would have undoubtedly provided more call

types that could have reduced the need for survey participants to provide additional

information, and thus decreased this 54% response rate. In the other two sections where

statements were provided prior to the open-ended requests for additional categories, the

response rates were much lower (17-19%, or as discussed previously, more accurately 5-11%).

4.3.8 Summary

The interviews and the survey increased the previously small amount of existing research conducted into police officer thinking and decision-making. The objective of this research was to identify the necessary components of a decision-making model which can be used to prepare police officers to appropriately exercise their discretion when dealing with ambiguous, time-pressured, and consequential situations. The survey built upon the results of the interviews by validating and extending the findings regarding the complexity of the frontline police officer decision-making process. The social context was highlighted as playing a large role in determining this complexity. The respondents identified so many potential variables to consider when weighing complexity of calls and making decisions, that it is apparent that any approach to improving decision-making will need to be very flexible. However, the identified situational characteristics which need to be considered and the techniques, information, and knowledge officers find helpful during front line police decision-making appear to be nearly inclusive. The situational characteristics, techniques, information, and knowledge identified in the interviews, combined with the themes identified in the survey, provide us with the structure of the police decision-making context. Frontline police officers have thus provided what researchers need to understand to assist in identifying the necessary components for a frontline police decision-making model.

Chapter 5: Discussion

5.1 Model Components

The objective of this research was to identify the necessary components of a decision-making model which can be used to prepare police officers for dealing with ambiguous, time-pressured, and consequential situations. This research included: a literature review, Critical Incident Analysis Interviews, and a survey of Canadian police officers. The results of these phases of research are combined in this final chapter to describe these components. From the literature review, the R/M model was identified as the best choice of the reviewed decision-making models to serve as a beginning framework. The analysis of the results of the interviews, combined with the results from the literature review, informed the design of the questionnaire for the survey. Domain specific themes were identified through analysis of the responses from the survey. These themes are necessary for developing scenarios to be included when using a decision-making model for preparation of police officers. The identified themes are discussed below and include from where in the survey the themes were identified to show both the consistency of the responses across the questionnaire, but also the complexity identified through widespread overlap of issues. Comparisons to the information reviewed in the literature are also included for each theme to provide further guidance as to how the police context information can be linked back to and supported by the literature. The necessity to include the full breadth of the cognitive continuum is discussed beginning with the need to include quick decisions based on recognition skills, through to the need to include mechanisms and opportunities for metacognitive skill based decisions. The

quick test to identify when CT is needed, the mechanisms of STEP and the truth advocate for use during CT, and the feedback process are discussed and supported by findings from the literature which can help with preparing training instructions for each component.

Identification of the components was the primary goal of this research, but the results of the literature review, interviews, and survey also provided guidance on how these can be combined to form a model for police decision-making. The components are thus merged to form a proposed Recognition-CT Police Decision-Making Model. An illustration and description of the full model are provided. The proposed model is the result of a review of decision-making theories and direct input from frontline practitioners. The limitations of the current research and suggestions of areas for future research are also discussed.

5.1.1 Domain Context through Identified Themes

Daniel Kahneman (2011) in his book *Thinking fast and slow* stated that his aim was to "improve the ability to identify and understand errors of judgment and choice, in others and eventually in ourselves, by providing a richer and more precise language to discuss them" (p. 4). He wrote this book for mass audiences, not just the researchers he would reach through academic articles and texts. If he could reach people and achieve this improvement, then he hoped that, "In at least some cases, an accurate diagnosis may suggest an intervention to limit the damage that bad judgments and choices often cause" (p. 4). Kahneman and his late research partner Amos Tversky (to whom he dedicates this book) have been leaders in the study of decision-making for decades. While not speaking specifically of police decision-making, the sentiments are applicable. Kahnemen and the

other researchers previously cited, all have something to bring to the table that can be of assistance to police officers. The "richer and more precise language" to which Kahneman refers is very helpful to researchers and for general discussions. Police officers themselves also have a great deal to offer. The themes identified here add the domain layer to help police discuss decision-making within their own profession. When we combine the research and the context, the result can help us to achieve Kahneman's goal of limiting damage caused by bad decisions. The domain context characteristics of problem, person, and social context are all represented in the responses illustrating the themes, thus highlighting the need for a model which includes consideration for all three categories of characteristics.

The decision-making descriptions from section 1 of the questionnaire provided initial reactions from survey participants, before they were exposed to the questions developed using information provided through the interviews. Aspects of all five categories of responses to this question were repeated throughout the responses to sections 3, 4, 5, and 6 of the questionnaire and thus give us an indication of the consistency of the responses, regardless of in what format the questions are asked. As can be noted from the category descriptions included in the results, there is some overlap between categories within sections. The primary category is identified for each grouping here, but in cases where significant overlap occurs, special mention is made. The five categories are: information, safety, planning, respite, and articulation. When referring to "sections" below, it is the section of the questionnaire in which the responses were received.

5.1.1.1 Information

Aspects of the information category were present in the frustration noted by officers in section 3 about not receiving cooperation and information from complainants and subjects during domestic disputes. Section 4 included three situational characteristics which received high agreement scores and relate to information: actions of a subject (can also relate to the safety category), information from initial view of situation, and information from dispatch. Eleven of the decision-making techniques and information statements from section 5 relate to the information category: knowledge about a specific person gained from firsthand previous experience, observing body language (could also relate to safety), knowledge about a similar situation gained from firsthand previous experience, knowledge about a specific person related by colleagues, information from police records, listening to what is being said including volume and voice cues, information from dispatch, knowledge about a similar situation related by colleagues, information from the public, legal guidance (could also relate to articulation), and policy and procedures of your police service (could also relate to articulation). Information was highlighted in all three parts of section 6: communications skills, information usage, written direction (could also relate to articulation), behavioural understanding, and other skills from training; communications, learning from mistakes and successes, and guidance from experienced officers from experience; and scenario training, coach officers, mentoring, and other forms of on the job training, communication training, importance of ongoing regular training, academic studies and legal knowledge (could also relate to articulation), and onus on officers from the suggestions.

When comparing the information provided by respondents to the information reviewed in the literature, there are issues which should be highlighted. Participants refer to common sense, instinct, intuition, and learning from mistakes and successes. These are all part of the pattern recognition process (Hammond, 2000; Zimmerman, 2006). Common sense is comprised of patterns officers have learned both before and after they join the police service. Instinct and intuition are quick pattern recognition that requires little cognitive effort. Because both of these processes require little effort and their development occurs over time without much introspection, there is often a tendency to either downplay their importance or deem the skills unteachable, either you have it or you do not. However, as was apparent from the findings discussed in the introductory chapter, intuition can be developed (Khatri & Ng, 2000).

5.1.1.2 Safety

Aspects of the safety category were present in the concern noted by officers in section 3 about keeping persons in mental health crisis safe and finding ways to do this without resorting to use of force or detention. Section 4 included six situational characteristics which received high agreement scores and relate to safety: potential for injury to any one on scene, distance separating subject from other people, availability of back up, availability of equipment, availability of cover (could also relate to respite), and location (could also relate to articulation). Safety was highlighted in all three parts of section 6: physical skills from training; physical presence and partners, backup, and knowing your limits from experience; and two-officer vehicles from the suggestions.

The current use of force training in Canadian police services includes practice for muscle memory for the instant decisions and includes de-escalation goals. What may be lacking is the middle piece of learning to accurately gauge whether one has time to access more information or change tactics. Zimmerman (2006) found that novices were less likely to reassess and change tactics. The effect of experience on tendency to reassess and alter tactics may be a beneficial area for exploration. The Cohen et al. (1998) R/M model *quick test* is designed to encourage reassessment.

5.1.1.3 Planning

Aspects of the planning category were present in the playing out scenarios in your mind and the breaking the process into sub-goals techniques of section 5. It was also present in the training portion of section 6 as decision tools. The recognition of patterns and thinking in advance aspects of scenario training cannot be separated from the concept of planning and thus, while discussed under a separate theme (information), will need to be linked in any models or training approaches.

5.1.1.4 Respite

Aspects of the respite category were present in the timing of back up (could also relate to safety) situational characteristic in section 4. It was also present in the experience portion of section 6 as reserving judgment, keeping emotions in check, and not rushing. Within the comments classified as general advice, or pearls of wisdom, a number of experienced officers suggested stepping back, staying calm, remembering to breathe, thinking things through, being patient, not rushing, buying time, etc. The literature also supported this approach. Scenarios and frameworks can facilitate pre-thinking as a

strategy to deal with difficult, urgent problems (Shanteau & Dino, 1993) and strategies for buying time (Flin et al., 2007) may help reduce: urgency to take control (Blum & Polisar, 2004), intolerance for ambiguity (Alison et al., 2008; Rastegary & Landy, 1993), need for structure (Kaplan et al., 1993), and shortcut coping processes (Edland & Svenson, 1993).

5.1.1.5 Articulation

Aspects of articulation were present in the five situational characteristics which had low levels of agreement in section 4: pressure from supervisors, pressure from public, media presence, pressure from Crown Attorneys, and media reporting. While this did not receive as much attention from the respondents as some of the other categories, from a practical perspective it cannot be ignored. The R. *v.* McNeil (2009) case and suggestions by authors such as Otu (2006), who suggests police officers be required to purchase individual occupational liability insurance, point to current and proposed accountability measures that illustrate the importance of police officers being able to articulate their decision-making process. Having a domain specific decision-making model will help police officers identify and articulate how they arrived at their decisions, as it will remove the reliance on vague terms such as common sense and good judgement and provide them with accurate language to describe the sometimes complex cognitive and planning processes.

5.1.2 Recognition

Recognition skills lead to proficiency in familiar situations (Cohen et al., 1998). It is this familiarity that aspects of police use of force training is designed to achieve.

Officers are drilled in use of force techniques so that when they recognize imminent threat, they can rely on muscle-memory for their reaction to save themselves or others from harm. This instant reaction can be based on intuition fueled by recognition that may not even be fully realized at a conscious level in the moment. Intuition is one of the anchors of Hammond's (2000) cognitive continuum. Scenarios can provide examples of appropriate responses where recognition can lead to quick reactions in varying situations, not just in the use of force, and help novice officers develop their recognition skills in a safe environment.

Developing intuition requires repeated exposure to complex, real problems, tying into the scenario training which is an ongoing suggestion from respondents. A "foundation of experience to draw upon" as suggested by one officer, is what researchers are referring to when they suggest repeated exposure to a wide variety of domain-specific scenarios as a means to build expertise (Cohen et al., 1998; Ericsson & Charness, 1994; Shanteau, 1992; van den Bosch & de Beer, 2007).

The dynamic nature of police calls for service and on view incidents lead to changeable situations, so pattern recognition will not always suffice in these sorts of situations. Thus, metacognition skills are also needed to evaluate and adapt as situations change. Constant reassessment needs to occur and the *quick test* can help police officers decide whether they have time to seek more information before they need to react.

5.1.3 *Quick Test*

The *quick test* of the R/M model gives the decision maker three criteria for weighing the costs and benefits associated with CT:

- costs of delay are acceptable,

- the situation is uncertain or novel, and

- the costs of an error are high (Cohen et al., 1998).

If one or more of these criteria is/are not met, the police officer can and should return to the recognition level of reaction. However, if these three criteria are met, CT should be initiated. The responsibility is then on the decision maker to gauge the time available to collect and analyse information. Experienced decision makers explicitly ask themselves how much time is available and they buy time (respite) by estimating available time more accurately, and more carefully plan their response (Cohen, et al., 1998). Experienced decision makers are also more comfortable with ambiguity thus they realize that a pattern may not exist that fits the situation perfectly (Cohen, et al., 1998). Decision-makers must recognize that, usually, one will have to act without having a complete picture of the situation (Klein, et al., 2010). Teaching decision makers to manage their attention so they are less vulnerable to distractions is also necessary (Klein et al., 2007), so that these three questions can be answered quickly and accurately.

Asking police officers whether they have strategies for buying time can help them think about, discuss, and develop these types of strategies (Flin et al., 2007). These strategies could, in turn, potentially help officers avoid some identified pitfalls of time pressured, stressful situations, such as: a sense of urgency to take control (Blum & Polisar, 2004), intolerance for ambiguity (Alison et al., 2008; Rastegary & Landy, 1993), need for structure (Kaplan et al., 1993), and shortcut coping processes (Edland & Svenson, 1993). Any discussion of time in policing will inevitably be followed up with

the concern of time as a scarce commodity, therefore, any models must consider the practical applications of managing time. Transitions in task tempo are a potential area of concern for this aspect of decision-making (MacGregor, 1993). The importance of continuous assessment, ability to adapt, and having alternate strategies readily available to facilitate rapid response shifts must be highlighted. Continuous assessment and adaptation need to take precedence over people's tendency to rely on simple cognitive strategies, so they can learn to use more complex strategies, if the state of urgency has passed. It is possible to reduce the degree of intolerance for ambiguity through education (Smock, 1955) and scenarios and frameworks can facilitate pre-thinking as a strategy to deal with difficult, urgent problems (Shanteau & Dino, 1993).

5.1.4 STEP

Once the decision is made that more time is available and more thought is required before action should be taken, the decision-maker now needs to move toward the metacognition end of the cognitive continuum, thus stepping fully into the realm of CT. As discussed previously, Cohen, et al. (1998) define CT as including:

> …the ability to sort out what is truly important, to address conflicts in the information that is available, to ferret out and refine the assumptions required to interpret the information, and to manage time wisely so that action is taken in a timely manner. (p. 188)

Decision-makers need to be taught mechanisms to assist them with CT. One of these mechanisms is Cohen et al.'s (1998) STEP process. STEP includes: constructing a Story, comparing expectations to what is known from the story to Test their assessments, Evaluating the result to assess the assumptions in the story, and Planning for the possibility that their current story may be wrong. This mechanism can be taught within a

police context through the use of scenarios. Internal reflection must be encouraged at the critiquing of stories stage as this is part of the continuous assessment recommended in the literature and the interview and survey results.

This process can help identify and avoid potential decision-making traps. Unconscious routines need to be identified, as awareness is the best protection from these traps. Researchers have identified the common traps and their work can help us identify assumptions, etc. that may cause distortion in thinking (for example, see Hammond et al., 1998 and Tversky & Kahneman, 1974).

5.1.5 Truth Advocate

The devil's, or more accurately truth, advocate role can be introduced during the STEP and feedback processes to uncover hidden assumptions in stories and to assist with the generation of alternative interpretations. This role is in line with suggestions to systematically search for evidence to disconfirm hypotheses (Kleinmutz, 1990). These contrarian thinking processes will help police officers avoid the confirming-evidence trap (Hammond et al., 1998).

5.1.6 Feedback

Learning about performance is necessary to make improvements in judgment and decision-making (Hammond, 2000). Police officers, like many professionals do not often learn about the outcomes of their performance. Scenario training with performance feedback on both the process and outcome can be particularly helpful in this area. PBL includes feedback processes (Bradford & Pynes, 1999; Hundersmarck, 2009; Kooi, 2006; Police Society for Problem Based Learning, n.d.; Robertson, 2004). Guided reflection

(Daley, 2001; Zimmerman, 2006) and EMT (Keith & Frese, 2008) could both be used to provide feedback.

Initial training should include these aspects, but the importance of ongoing regular training was stressed by respondents and the literature agrees. Domain specific information needs to be learned and decision-making in that domain practiced with feedback in order to develop expertise (Cohen et al., 1998; Ericsson & Charness, 1994; Hammond, 2000; Shanteau, 1992; Simon, 1990). Given the overwhelming amount of information that is provided in initial police training, it may take some time for officers to gain enough experience with which to frame the knowledge. Ongoing training inserted at various experience levels can help officers with reframing knowledge (Klein, et al., 2007), professional practice (Cervero, 2001), and decision-making (Blum & Polisar, 2004). Opportunities made available via technology such as scenario software (e.g., Jean, 2009) and interactive web-based programs (Canadian Police Knowledge Network, n.d.; Kumta et al., 2003) should not be overlooked.

5.2 Recognition-CT Police Decision-Making Model

The necessary components of a decision-making model which can be used to prepare police officers to appropriately exercise their discretion when dealing with ambiguous, time-pressured, and consequential situations have been identified and discussed. The next logical step is to combine these components into a model for police decision-making which can then be tested. Figure 5.1 is an illustration of how the necessary components and the identified themes interact to form a proposed Recognition-

CT Police Decision-Making Model. This proposed model is the final product of this research. A description of the model is provided below.
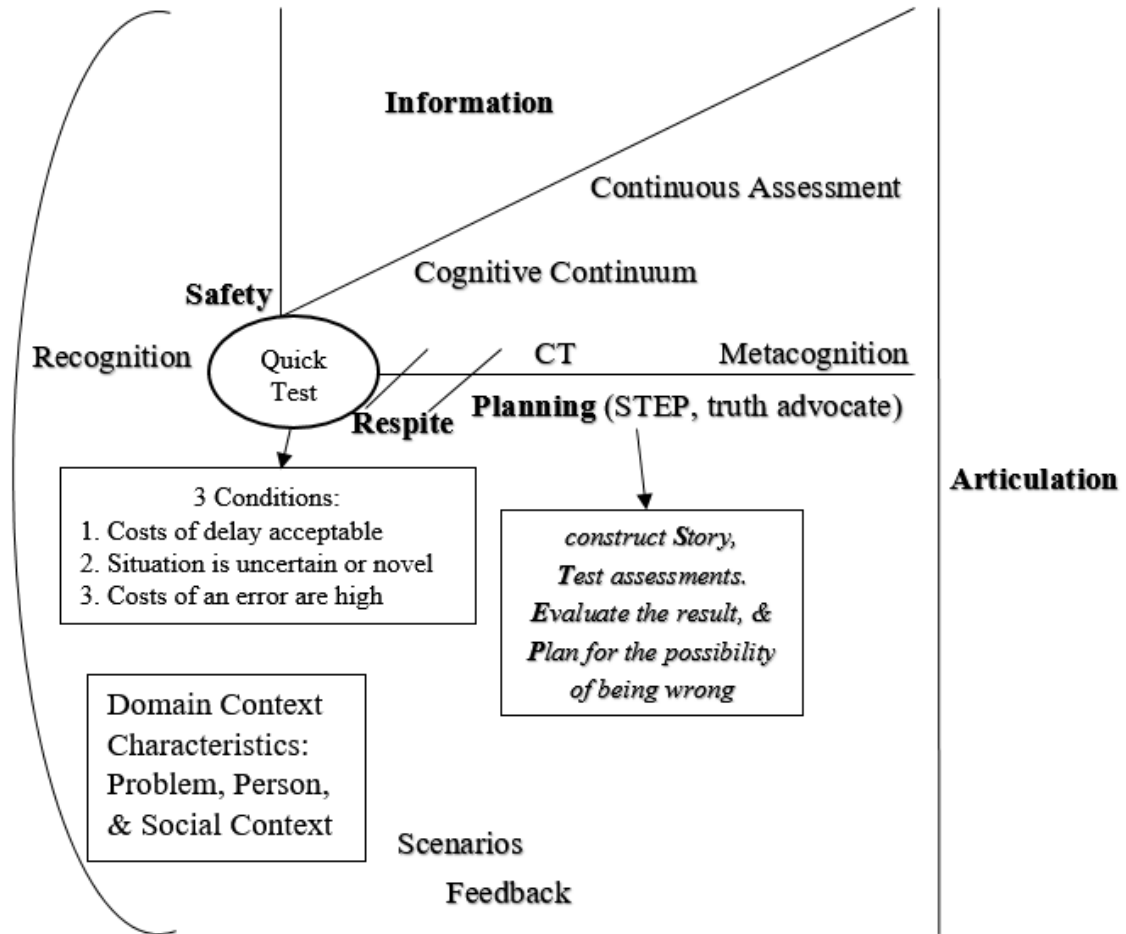

Figure 5.1: Recognition-CT Police Decision-Making Model

The theme of **information** is placed at the top of the model. The amount of information available to a police officer will vary as is illustrated by the two lines forming a funnel shape. The line on the left is the minimum information an officer will have and the officer may need to decide with just that information. The **quick test** is how an officer should decide whether they should collect more information. **Safety** is an important

theme here as the action or inaction of a police officer can impact the safety of: the subject with whom he/she is interacting, the surrounding members of the public, and the police officer(s) present. This theme then is one of the major considerations when reviewing the three **conditions** of the quick test: **1. costs of delay acceptable**, **2. situation is uncertain or novel**, and **3. costs of an error are high**. If one of these conditions is not met, the police officer should not, or does not need to seek more information. In these instances, the decision may be made subconsciously or consciously through pattern **recognition**. Use of force training in police services mostly focus on these moments. Police officers are taught to recognize patterns in subjects and react quickly, training repetitively so that the actions form muscle memory.

Alternatively, if all three conditions are met, the police officer can and should move along the **cognitive continuum** toward **CT** and **metacognition**. The interpretation of these conditions will be impacted by the experience of the decision-maker, with more experienced decision-makers trying to buy themselves more time, focusing on longer term versus immediate goals, and realizing that some situations do not fit any pattern perfectly. The **respite** theme (indicated by the diagonal slashes along the continuum) comes into play at this point. Respite factors allow the police officer to seek more information, thus moving the officer toward the line on the right of the information funnel. The police officer can now engage in CT while also practicing **continuous assessment** of the situation, in case something happens to change the three conditions. Using CT, will aid the **planning** process. The **STEP** and **truth advocate** tools will structure the CT. Through STEP, the police officer will **construct a Story** based on the

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information they receive. The expectations that would result from the story are then compared to what is known and observed to **Test the assessments**. If there is conflicting evidence, then the story is adapted. The police officer will then **Evaluate the result**. If the story does not hold up, a new story must be considered. Throughout this process the police officer must **Plan for the possibility of being wrong**. While critiquing the story, a truth advocate approach (also known as devil's advocate) is helpful. A police officer working alone may need to play this role and thoroughly question his/her own assumptions. Considering what a supervisor, a crown/defence attorney, the media, or the public may ask can allow for a shift in perspective. If working with other(s), the role can be assigned to one individual or shared.

How much information is considered, and thus how far the right line moves to enlarge the funnel, will depend on the situation. The complexity and seriousness of the situation will interact with the time and resources available. An individual police officer encountering a routine incident during a shift will probably not need to collect a large amount of information. Whereas, a serious incident to which multiple police officers are dispatched could require the collection of very large amounts of information. The frontline officer can be involved in incidents that range between the two extremes. While many serious and complex investigations are eventually handed over to specialized investigators, the frontline police officers initially on scene begin the collection of information and make the first decisions about how the police service will start to react, and they may continue to be involved throughout the investigation in various roles.

Of the three categories of **characteristics** that affect how practitioners decide: **problem**, **person**, and **social context**, the last is the least recognized in decision-making models, but is particularly important in the **domain context** of policing (represented by the all-encompassing arc to the left of the model). Social context must be included in any model for police decision-making. The R/M model is a proven decision-making model that includes the social context. To be domain specific the R/M model mechanisms (scenarios, STEP, and quick test for environment; recognition and feedback for the person; and truth advocate for social) all require information of the sort gathered through the current research.

We can now use the five identified themes (information, safety, planning, respite, and articulation) for **scenario** creation. The domain knowledge provided through the themes combined with the R/M model provide a comprehensive police decision-making model. The model and its strategies for CT should be taught to students with pre-existing knowledge in a specific domain (Cohen et al., 1998). The instructions should start in a simple learning environment with time, **feedback**, and support for practice before integrating CT into exercises in more dynamic and interactive learning environments (van den Bosch & de Beer, 2007). Toward the end of recruit training, students will have enough domain knowledge to start with simpler scenarios. Feedback will help them progress through to intermediate scenarios. For true depth of instruction, scenario training should also occur after the students have spent time in the field working with their coach officers and have more domain knowledge and experience. The goal is to promote and support adaptive, independent thinking by police officers throughout their careers.

The last theme of **articulation** is represented by the straight line on the right of the model. While articulation is often not considered during decision-making, leaving it until the end will result in poor decisions and less than acceptable answers to many questions. The line runs from the top to the bottom of the model to show it should be considered at all stages. Just as in the truth advocate process, it is important to consider what questions will be asked and how those questions will be answered. It is inherent in the CT process.

This model adds to the theory-driven decision-making models discussed in the literature review by providing a police domain context. The proposed model also furthers the process beyond other police decision-making models and frameworks by providing theory and research supported tools, context themes, and components for decision-making to achieve activities across the cognitive continuum.

5.3 Limitations of this Research

Through the literature review process multiple decision-making models were discussed and compared. The R/M model was identified as a proven model with a sound theoretical basis. The next challenge was to identify whether the mechanisms of the R/M model would work in the policing context. Identifying the rich and detailed information necessary to describe domain specific context is best accomplished through use of qualitative studies. Finding police officers willing to volunteer their time to discuss their decision-making processes was challenging. Though small in number, the interviews yielded helpful information for constructing the questionnaire for the survey. The experiences of these interviewees are not anticipated to be representative of the

experiences of all police officers across Canada, due to their small number, limited geographic range, and all of them being sampled from the same police service. The survey yielded less detailed information, but increased the sample size, geographic range, and number and type of police services represented. Information identifying location and type of service (rural, urban, municipal, regional, provincial, federal, etc.) was not requested in the questionnaire, as this information could identify individual police services and thus it was feared this lack of anonymity might discourage the participation of some services. As a result of not collecting this information, it is not known how many or what type of services are represented in the responses. All volunteers for the interviews and the survey respondents self-selected, so they may not be as representative as a sample chosen randomly. Randomly chosen respondents may not have been as forthcoming as those who were interested enough in the topic of decision-making to volunteer their time and information. The information collected was detailed and rich, but small in number and self-selected, thus it cannot be confidently stated to be representative of all Canadian police officers. Additionally, response saturation was not achieved for the interviews and was only achieved for the first open-ended question of the survey. This question lead to the identification of the five themes, and aspects of all five themes were reinforced throughout the remaining open-ended question responses. The themes informed the proposed model. The lack of saturation for the other questions indicates that the model may not be complete. There may be other themes and components which should be included. This is one of the reasons the proposed model requires testing.

While having many strengths, qualitative studies can be prone to researcher bias. The experience of the researcher will impact upon the interpretation of qualitative results in the form of increased sensitivity to cues. As self-report of decision-making can be challenging, guided recall by a researcher sensitive to the context can serve to deepen the recall. However, this sensitivity can also lead to bias if the researcher is not careful to conduct their own introspection as they review the results. As discussed in the methods sections for the interviews and survey, the researcher was the only person to review the data as this was guaranteed to the participating police services, the interviewees, and the respondents. The goal was to remove potential barriers to full and honest participation. The limitation however, was that this did not allow for inter-rater reliability checks. This was a necessary tradeoff especially when asking participants to self-report less than optimal decision-making incidents and their preparation, or in some cases lack thereof, for frontline decision-making. Even with these caveats, this research provides another layer of information to improve our understanding of the complex and ambiguous environment in which police decision-making occurs, and this information supplies the domain specific context necessary to use the R/M model in police education and training.

5.4 Future Research

While reviewing the literature, several gaps were identified. While the scope of this research is not wide enough to address all the gaps, it may be helpful to other researchers to briefly discuss some of these areas within the context of these findings. The first suggestion for future research based on findings from this study, is for testing of this newly proposed Recognition-CT Police Decision-Making Model. The model should be

tested with new, more diverse interview and survey samples. The Critical Incident Analysis Interview technique, the semi-structured interview guide, the survey method, and questionnaire are all described here in detail. Interested researchers now have an opportunity to use these tools in individual police services and compare the results described here to their own results. With cooperation across police services, there could be a concerted effort to build upon the work conducted and address the limitations discussed above. The model should also be tested in the training and education of police officers. The theoretical and evidence based findings identified here can now also be incorporated into the training of recruits and experienced officers in interested police services. This would open more opportunities to test the individual components of the model, and the model as a whole.

Other areas for future research were also identified during the literature review and referenced in various ways through the interview and survey responses. Bounded rationality and measuring CT are two of the most promising areas for police decision-making research, so these are discussed below along with some alternative methods for research which could help with triangulation of the concepts.

5.4.1 Bounded Rationality

Gigerenzer and Todd (1999) recognize that different domains require different specialized tools. Policing does not currently have a lot of heuristics, but there are some police training approaches that could be studied in more detail to identify and refine these tools. Some areas meriting exploration of using heuristics in policing are in the area of use of force. There are times when there is very little or no time available to decide how

to act. Todd and Gigerenzer (1999, 2003) point out that there are situations that do not require a trade-off between speed and accuracy, as fast and frugal heuristics can sometimes be more accurate than analysis of all available data. The National Use-of-Force Framework for Canadian police officers (Hoffman et al., 2004) is a decision-making tool that tries to incorporate situations that fall into this lack of time area and also assist in dynamic environments that may change quickly. The framework is quite general, so attempts are made by individual police services to supplement the training. For example, the Toronto Police Service (2008) developed a course entitled, *Characteristics of an Armed Person* which they have made available to other police officers through CPKN. Based on the literature review, it appears that this course may be a good candidate for research into potential heuristic use in policing.

5.4.2 Measuring CT

Any further exploration of the role of CT in police decision-making will require new ways of measuring CT. Single techniques will probably not be adequate to measure the complex nature and effects of CT. Ku (2009) is one of the voices calling for change in this area. Multiple-choice measures are not adequate, as this approach only measures recognition and does not capture dispositional characteristics. The current measures also have not been sufficient to ascertain if CT is being used in professional practice (Rapps, Riegel, & Glaser, 2001). Measures that assess underlying reasoning and ability to spontaneously engage in CT are necessary. CT assessment tools using both multiple-choice and open-ended format measures should be developed and empirically validated.

Technical approaches must also be considered for future use in measuring CT. Johnson et al. (2014) used wireless Electroencephalography (EEG) devices to measure psychophysiological indicators during deadly force judgment and decision-making (DFJDM) video simulations. Their sample included novices (citizen) and experienced military and police officers. The military and police officers were divided post hoc into intermediate and expert groups for comparison with the novices. Their results showed that with further research these indicators may be able to be used for feedback to accelerate skill acquisition and as objective performance measures. Follow-up to these findings could be comparing the psychophysiological indicators during various types of decision-making in those with and without CT training. Additionally, study of the cave automatic virtual environment simulators now being used by some police services to immerse their officers in 300 degree virtual reality scenarios where they learn to decide when to shoot (Lapowsky, 2015) would allow for immediate critical incident debriefing and allow for better recall of decision-making. While developing a true sense of danger in these simulated (virtual reality) environments is perhaps not possible, it is possible to increase some of the social context aspects such as perspective taking (Moskaliuk, Bertram, & Cress, 2013).

We also need to continue to include the decision makers in the exploration of their processes. Pinizzotto, Davis, Bohrer, and Infanti (2012) surveyed police use of force instructors about their history of critical incidents and their use of and restraint from using deadly force. In their estimation, this was the first study to focus on restraint from using deadly force. They report that 93% of the incidents reported were instances where the

respondents refrained from using deadly force even though they were legally justified to do so. They suggest further research on restraint can help explain the factors that influence the 'deadly mix' of the dynamic convergence of officer, offender, and circumstances. The use of a survey to ask officers about their decision-making, such as the current study, is a step in this direction.

There are some studies that have broadened our consideration of how research can be conducted. For example, police research took a large step forward with the Project on Policing Neighborhoods in Indianapolis, Indiana and St. Petersburg, Florida conducted in 1996 and 1997 by Mastrofski, Parks, Worden, and Reiss (1996). Several research methods were used and various types of quantitative and qualitative data were collected to provide various measures and perspectives. These data are available to the general public through the National Archive of Criminal Justice Data (NACJD). There are 92 citations listed on the NACJD website as being associated with the data and more research is still being published, such as Bonner (2015) whose focus was shining more light on the 'black box' of officer decisions during dispute encounters. The initial study has also inspired similar approaches elsewhere. For example, Schulenberg (2014, 2015, 2016) conducted a sole observer systematic social observation study in a Canadian regional police service with a methodology similar to the original U.S. study. These multi-method approaches result in rich data sets that can be used to explore innumerable topics and hypotheses.

We also need to continue to explore and expand upon various perspectives. Guffey, Larson, Zimmerman, and Shook (2007) set out to develop a screening-in device

using a list of desirable characteristics as decided by a group of content experts. Their

Thurstone Scale method study identified five factors for definite inclusion: excellent

moral character, physically fit, even-tempered under stressful conditions, excellent

judgment, and dependable. Their expert judges also submitted additional factors beyond

those suggested by the authors, one of which included "Able to Make Decisions" (p. 8).

Even though achieving agreement on desirable characteristics had been historically

elusive, continued perseverance through a different perspective has now progressed this

area. Continued wading around in Schön's (1987) swamp can lead to important findings

that can advance decision-making capabilities.

5.5 Conclusion

As is evident from the above discussion the comments of the participants were

generally in line with what was found in the literature. However, there were a few

comments that diverged. For example, previous experience was mistaken by some as

common sense. Most of the participants did not discount their experience of decision-

making ability so lightly. Also, as addressed in the literature review, intuition is

experience working subconsciously, but some officers passed it off as either something

you have or you do not or that can only be gained through experience, not something that

could be taught. It is important to combine multiple perspectives of viewing the same

issue in order to expose potential misconceptions in understanding. The 'black box' of

decision-making was viewed as sufficiently described via rational thinking models (with

just some irrational outliers) for years before more in depth study by various disciplines

using multiple methods produced ground breaking findings that proved that humans are

not rational thinkers. Kahneman (2011) describes the history of this shift in decision-making research. Moving out of our disciplinary silos and challenging each others' findings is an important way to advance knowledge. Involving practitioners in that research is another important way to advance knowledge.

Police officers have a great deal of discretion where they may choose to act or not act, use force or talk things out, detain or arrest, search and seize, etc. and must decide all this, usually on their own and in the moment, while considering what courts, the public, and inquiries will deem reasonable at a later date. As discussed in the introduction, these decisions are not always optimal. Society has a responsibility to assist police in their work to prevent crime and disorder. Researchers are uniquely qualified to assist in multiple areas that have far reaching consequences. Bradley and Nixon (2009) compared the critical and policy police research traditions and suggested that a third approach is also necessary. They assert that police need knowledge to strategically improve their policies and practice and that these needs are only partially met through the two established approaches to police research. Greater impact can be had through close and continuous police-university partnerships. They point to participatory action research as one way to involve and give voice to all stakeholders in the research process. Their goals go beyond knowledge generation, to also include validation, diffusion, and use within public policing.

We need to fill the research void around police decision-making. We need to identify evidence based methods of selection, training, and education that can prepare police officers for the decisions they need to make in ambiguous, time-pressured, and

consequential situations. The proposed model and its components are an important step in that direction. The model is based on a proven and theory-driven decision-making model, optimized for use in the police context. Evidence based tools and context themes (information, safety, planning, respite, and articulation) are provided. Decision-making across the full breadth of the cognitive continuum, from instant decisions to longer more complex processes is supported. The model can help police officers learn to accurately gauge whether they have, or can buy, time to access more information or change tactics. Continuous assessment is encouraged. Scenario training and feedback are integral parts of the approach. Urgency, stress from ambiguity, and the use of flawed shortcut coping processes, such as stereotypes can be reduced. A domain specific decision-making model will help police officers discuss, explore, improve, identify, and articulate how they arrive at their decisions. This will remove the reliance on vague terms such as common sense and good judgement and provide police officers with accurate, actionable language to discuss their decision-making. The proposed Recognition-CT Police Decision-Making Model can help prepare and support officers in their difficult and demanding duties.

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Appendices

Appendix A: Formal Request to Police Service to Participate in Interviews

Dear Chief _____,

As part of my PhD I am conducting research on police decision making. The first phase of the research involves conducting interviews with front line police officers. I write to request the participation of the _____ in this research. The interviews will provide the information necessary to compose a survey for front line Canadian police officers on decision making. An expected 20 interviews will be required. The actual number of interviews will be determined by the point at which enough novel information has been gathered to construct the survey. The interviews and survey will provide police context that can then be compared to existing decision making models. The goal is to develop/adapt a model that will complement the police context and form the basis for education and training of police officers regarding front line decision making. All services and individuals who wish to receive feedback will be contacted when the report is available.

With your permission, I wish to forward a request to the front line officers of the _____ Patrol Division to request their participation in this research. Here is the text of the email I wish to send to the officers.

Subject: Research Participation Request for Front Line Police Decision Making

As police officers you are continuously required to make decisions in the field. Your ability to critically review the available information and arrive at a supportable judgment and decision is extremely important as many of your decisions carry large consequences impacting the rights, freedom, and safety of society and individuals. There is a need for research on front line police decision making. You are invited to participate in a research initiative that will explore critical incidents and decision making competencies for front line policing. This research will include interviews with front line uniform police officers regarding decision making in situations of limited time and resources.

The interviews will be conducted face-to-face in the Bounded Rationality and Law Laboratory in the Psychology Department at Memorial University St. John's campus. Participants will be asked to recount two critical incidents and what they remember about their decision making during those incidents. The interviews will take between 1 and 2 hours.

If you are interested in taking part in the study, please contact the researcher, Sharon Barter Trenholm, via email at sbartertrenholm@mun.ca. Participation in the interviews is voluntary and the information gathered will be confidential. Only aggregate information will be reported. The research is approved by _____

management, however there is no expectation by the police service that officers participate in this research. The choice is entirely up to you, and senior officers or administrators will not be provided with names of those who do or do not participate.

I have discussed the project with Deputy Chiefs _____ and _____ and they have agreed that there are times when operationally one officer at a time will be able to be spared to participate during on-duty hours. If you agree to the project, please communicate to all supervisors that officers are not to be recruited for participation beyond the above proposed email communication from the researcher. Interested officers must contact the researcher voluntarily. It will be communicated by the researcher to all interested officers that they may self-identify to their supervisor if they wish to participate during on-duty time or they may choose to participate during off-duty hours and that the research is approved by _____ management, however there is no expectation by the police service that officers participate in this research. The choice is entirely up to them, and senior officers or administrators will not be provided with names of those who do or do not participate.

If you would like to discuss this research initiative, please contact me and we can schedule a time convenient to you for us to meet. Thank you for your consideration of this request.

Sincerely

Sharon Barter Trenholm

Appendix B: Email Request to Patrol Officers to Participate in Interviews

Subject: Research Participation Request for Front Line Police Decision Making

As police officers you are continuously required to make decisions in the field. Your ability to critically review the available information and arrive at a supportable judgment and decision is extremely important as many of your decisions carry large consequences impacting the rights, freedom, and safety of society and individuals. There is a need for research on front line police decision making. You are invited to participate in a research initiative that will explore critical incidents and decision making competencies for front line policing. This research will include interviews with front line uniform police officers regarding decision making in situations of limited time and resources.

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If you are interested in taking part in the study, please contact the researcher, Sharon Barter Trenholm, via email at sbartertrenholm@mun.ca. Participation in the interviews is voluntary and the information gathered will be confidential. Only aggregate information will be reported. The research is approved by _____ management, however there is no expectation by the police service that officers participate in this research. The choice is entirely up to you, and senior officers or administrators will not be provided with names of those who do or do not participate.

Appendix C: Informed Consent Document for Interviews

Informed Consent Form

Title: The Role of Critical Thinking in Frontline Police Decision Making

Researcher: Sharon Barter Trenholm

                                Memorial University of Newfoundland

                                sbartertrenholm@mun.ca

You are invited to take part in a research project entitled: *The role of critical thinking in frontline police decision making.*

This form is part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. It also describes your right to withdraw from the study at any time. In order to decide whether you wish to participate in this research study, you should understand enough about its risks and benefits to be able to make an informed decision. This is the informed consent process. Take time to read this carefully and to understand the information given to you. Please contact the researcher, Sharon Barter Trenholm, if you have any questions about the study or for more information not included here before you consent.

It is entirely up to you to decide whether to take part in this research. If you choose not to take part in this research or if you decide to withdraw from the research once it has started, there will be no negative consequences for you, now or in the future.

The research is approved by _____ management, however there is no expectation by the police service that officers participate in this research. The choice is entirely up to you, and senior officers or administrators will not be provided with names of those who do or do not participate.

Introduction

As part of my Interdisciplinary PhD thesis, I am conducting research under the supervision of Dr. Brent Snook (Psychology), Dr. Kara Arnold (Business), and Dr. Vernon Curran (Education, cross-appointed to Medicine). I am also a lecturer in the Police Studies Major in the Bachelor of Arts program at Memorial University. This return to academia comes after 17 years in planning and research with a medium sized police service.

This study is an exploration of the role of critical thinking in the decision making of front line police officers. Much of the research on decision making has occurred in the laboratory and the efforts to apply these findings to the world outside the laboratory have had mixed results. There is some promising work in naturalistic decision making that incorporates the pressures of time

sensitive and stressful environments. The research on critical thinking indicates it can improve decision making, but that the greatest improvements can be made only when the context is understood. This research is an attempt to combine the findings from the naturalistic decision making and critical thinking research with the context of front line policing, in order to create a model of front line police decision making. The use of a model can lead to improvements in the recruitment, selection, education, and training of police officers.

Purpose of study:

This study will collect information from local police officers on their decision making during critical incidents and collect their experience and opinions regarding training and education they have received on decision making. This information will then be used to create a survey for police officers across the country. The results of the research will provide the necessary context to begin integrating research from related areas with what we know about police decision making.

What you will do in this study:

You will be interviewed by the researcher and asked to recount two critical incidents where you were required to make front line police decisions. You will be asked to answer questions on those incidents and general questions on police decision making, based on your own experiences. You will also be asked some questions about yourself and your police experience.

Length of time:

The interview should take around 1 to 2 hours to complete.

Withdrawal from the study:

Your participation in this research is entirely voluntary. At any point during the interview you have the right to not answer any questions or to withdraw with no penalty whatsoever. If you decide to withdraw, you will be asked if the information you have already provided can be used in the study. If you agree, the information already gathered will be kept. If you disagree or do not answer, the information will be discarded. There will be no consequences for withdrawal.

Possible benefits:

Personally, you will be provided an opportunity to reflect on and discuss your decision making relating to critical incidents you have experienced. Reflection and discussion can lead to improved decision making through improved critical thinking. Generally, your participation in the interview will contribute toward the research on police decision making. Your responses, combined with those of other interviewees, will provide the information necessary to draft a context survey for Canadian police officers on front line police decision making. This context

information is necessary to advance the critical thinking and naturalistic decision making literature into the police realm. By understanding the police context of decision making, researchers can further explore specific considerations for police decision making and teachers and instructors can use these findings to improve the preparation of recruit police officers and the continuing education of experienced police officers. The benefits to society will be improved protection of individuals' rights and freedoms and improved functioning of the justice system.

Possible risks:

The interview is an opportunity to participate in improving decision making for police officers. One of the ways we learn is from reviewing our mistakes. The information collected here will only be reported in aggregate and in quotations from unidentified sources. However, if you reflect on a situation that you feel you mishandled, this may lead to some stress. If the stress becomes uncomfortable, you can end the interview. If the stress continues, you are encouraged to contact the Government of _____ Employee Assistance Program at _____ or Toll Free: _____.

Confidentiality vs. Anonymity

There is a difference between confidentiality and anonymity: Confidentiality is ensuring that identities of participants are accessible only to those authorized to have access. Anonymity is a result of not disclosing participant's identifying characteristics (such as name or description of physical appearance).

Confidentiality and Storage of Data:

All interview information is confidential. The information will be used only by Sharon Barter Trenholm for the purpose of research publications, conference presentations, or teaching material. The information that is obtained will be stored in password protected devices for five years after the research is completed. All consent forms and hard copies of notes will be stored in a locked filing cabinet located in room 2057E of the Science Building of Memorial University and destroyed after a period of five years. The email addresses will be stored separately and destroyed once the research is complete and you have been advised, if you indicated your wish to be, that the report is available.

Anonymity:

The information collected in the interviews is coded with a number that is not associated with your name. Every reasonable effort will be made to assure your anonymity and you will not be identified in any reports and publications.

Recording of Data:

The interviews will be audio recorded.

Reporting of Results:

The data collected will be used for the researcher's PhD thesis and potentially for journal article(s) and conference presentation(s). The data will be used to prepare the survey and none of the information will identify individuals from the interviews.

Sharing of Results with Participants:

A report will be written on the results of the eventual survey. Please contact Sharon Barter Trenholm if you would like a copy of the group results.

Questions:

You are welcome to ask questions at any time during your participation in this research. If you would like more information about this study, please contact: Sharon Barter Trenholm at sbartertrenholm@mun.ca.

The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in Human Research and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research (such as the way you have been treated or your rights as a participant), you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at 709-864-2861.

Consent:

Your signature on this form means that:

- You have read the information about the research.
- You have been able to ask questions about this study.
- You are satisfied with the answers to all your questions.
- You understand what the study is about and what you will be doing.
- You understand that you are free to withdraw from the study at any time, without having to give a reason, and that doing so will not affect you now or in the future.
- You understand that any data collected from you up to the point of your withdrawal will be destroyed.

If you sign this form, you do not give up your legal rights and do not release the researchers from their professional responsibilities.

Your signature:

I have read and understood what this study is about and appreciate the risks and benefits. I have had adequate time to think about this and had the opportunity to ask questions and my questions have been answered.

☐ I agree to participate in the research project understanding the risks and contributions of my participation, that my participation is voluntary, and that I may end my participation at any time.

☐ I agree to be audio-recorded during the interview

A copy of this Informed Consent Form has been given to me for my records.

_____	_____
Signature of participant	Date

Researcher's Signature:

I have explained this study to the best of my ability. I invited questions and gave answers. I believe that the participant fully understands what is involved in being in the study, any potential risks of the study and that he or she has freely chosen to be in the study.

_____	_____
Signature of Principal Investigator	Date

Appendix D: Semi-Structured Interview Guide

Semi-Structured Interview Guide

Thank you for agreeing to participate in this research initiative. The purpose of the interviews is to increase understanding of police decision processes when encountering time-pressured, ambiguous situations where there are significant potential consequences for those present. We will not be evaluating your decisions or actions, only trying to understand the decision process during these incidents.

I am recording the interview so I can review your responses multiple times when analysing the data, but all the information obtained in these interviews is confidential. The recordings will not be viewed by anyone other than the researchers involved in this project.

I want you to think about incidents during your career when you had to make decisions that impacted the individuals involved in the situation while you were present with them in the situation. I want you to narrow it down to incidents where the solutions were not obvious, but you did not have a lot of time to consider the solution, and there were significant potential consequences for those present with you. Now, I want you to pick out two incidents: one where you feel you could have made a better decision and one where you are confident you made the best decision possible. We will talk about the incident with the less than optimal decision first and then discuss the optimal decision after that. The questions I ask you will be relatively the same for each.

Step 1: Incident Recall

I want you to recount the episode in its entirety, from beginning to end, providing as much detail as possible. Start from the moment you "got the call." Summarize what the call was about and then proceed to describe the event including what you did, what you saw, heard, smelled, felt. Also, describe the thoughts you had as the incident unfolded, cues and indicators you picked up from individuals' behaviors or other sources, perceptions about motives and intentions, your decisions and action choices, and rejected actions.

Step 2: Incident Retelling

We are going to go over the story multiple times in an effort to collect as many details as possible. Now, I will tell your story back to you, to make sure I understand what you said. Listen to the details and sequence and jump in with additional details, clarifications, and corrections.

Step 3: Time Line Verification and Decision Point Identification

Now we will create a time line for the incident. The time line is composed of the important events, decisions, and actions taken during the event. We will divide the incident into segments and identify key events and points when decisions were made and actions were taken and determine when important information was received and when action choices were contemplated.

Step 4: Progressive Deepening

Now we want to get at the key cognitive events from the situation. I will ask you some questions that focus attention on particular aspects of each decision-making event. The questions will focus on the information, or cues, used in situation assessment, and about the expectations, goals and actions those cues elicited. We want to identify what you knew, when you knew it, how you knew it, and what you did with what you knew (note: potential probe questions provided below).

Step 5: "What-if?" Queries

During the final account of the incident, we will shift from your actual experience to a more analytical strategy. I will pose various hypothetical changes to the incident account and ask you to speculate on what might have happened differently, how you may have responded differently, and how the outcome may have been altered (note: potential probe questions provided below). As we proceed we can identify potential errors at each decision point, and discuss how and why these errors might occur. We are discussing this to understand the vulnerabilities and critical junctures within the event, not to highlight things officers may do wrong.

Now that we have gone through this incident in detail, we will do the same for the optimal decision incident (note: proceed through steps 1-5).

Demographic Questions

There are a few questions I want to ask for comparison purposes.

1. Sex: Male Female (note: will be noted, not asked)

2. What is your age?

3. How many years have you been employed as a police officer?

4. What is your highest level of education received: university degree, university/college diploma, some university/college, high school?

5. What is your rank?

Thank You

The purpose of the interview was to understand how police officers assess critical incidents and make decisions. As mentioned in the research invitation, I am going to use this information to develop a survey for Canadian police officers that will help me develop a decision making model for front line policing. Do you have any questions?

Thank you for providing interesting and very useful information and thank you for your time.

Note: The above procedure was adapted from Zimmerman (2006), who obtained it from Hoffman, Crandall, and Shadbolt (1998).

Potential Probe Questions

Step 4

Cues

What were you seeing, hearing, smelling?

What did you think was going on at that point?

What specific factors (cues, indicators) led to your interpretation?

What was seen/heard that caused you to choose the course of action?

Concerns

What concerns did you have at this point, if any?

What concerns might a less (or more) experienced officer have at this point?

Did this cue/indicator lead you to be concerned? How so?

What was your stress level at this point?

Goals

What were your specific goals and objectives at this time?

What were your short term objectives at this time?

What were you trying to achieve at this point?

Basis of Choice

Why was this option selected?

Why were other options rejected?

Options

What other courses of action were considered?

What other courses of action were available?

Are there any alternative actions that might have worked?

Mental Modeling

Did you think of the events that would unfold?

Did you imagine the possible consequences of this action?

Knowledge

What information did you use in making this decision?

How was this information obtained?

Confidence

How confident were you in the decision you made?

How confident were you as you performed this action?

Standard Operating Procedures

Does this case fit a standard or typical scenario?

How is this case different from the standard scenario?

Does this case fit a scenario you were trained to deal with?

What do you do at each step in this procedure?

Expectations

What outcome did you expect from that action?

What did you think would happen next?

From the individual's behavior, what did you think he would do next?

Reasoning Rules

Why/how/when would you do that?

Is (the rule) always the case?

Step 5

<u>Hypotheticals</u>

If XXX had been different, how might that have influenced your decision?

If action X had led to outcome Z (a different outcome from what happened):

- what would you have done different?

- would your asessment of the situation change?

<u>Test Assumptions</u>

You said that X meant that Y happened but what if Z happened instead?

What if it were not the case that (currently true condition)?

<u>Experience</u>

What specific training or experience was helpful in making this decision?

Had you previously encountered a situation like this one?

How might a less (or more) experienced officer have behaved differently?

<u>Errors</u>

What mistakes are likely at this point?

What errors would inexperienced officers be likely to make in this situation?

Are there any cues an inexperienced officer might miss in this situation?

<u>Aiding</u>

What information could you have used at this time to make a different (better) decision?

If the decision was not the best, what training, knowledge, information could have helped?

Adapted from Zimmerman (2006, pp. 95-96).

References

Hoffman, R., Crandall, B., & Shadbolt, N. (1998). Use of the critical decision method to elicit expert knowledge: A case study in the methodology of cognitive task analysis. *Human Factors*, *40*(2), 254-276. doi: 10.1518/001872098779480442

Zimmerman, L. A. (2006). Law enforcement decision making during critical incidents: A three-pronged approach to understanding and enhancing law enforcement decision processes. *Dissertation Abstracts International, 67*, 4-B. (UMI No. 3214014).

Appendix E: Canadian Police Sector Council Listing of 200 Police Services

Canada's Police Services (200)

Municipal Services (195)

British Columbia (14)
Abbotsford Police Department
Central Saanich Police Service
Delta Police Department
Greater Vancouver Transportation Authority Police Service
Kitasoo Xaixasi Police Service
Nelson City Police Department
New Westminster Police Service
Oak Bay Police Department
Port Moody Police Department
Saanich Police Department
Stl' Atl' Imx Tribal Police
Vancouver Police Department
Victoria Police Department
West Vancouver Police Department

Alberta (11)
Blood Tribe Police Service
Calgary Police Service
Camrose Police Service
Edmonton Police Service
Lacombe Police Service
Lakeshore Regional Police Service
Lethbridge Regional Police Service
Medicine Hat Police Service
North Peace Tribal Police Service
Taber Police Service
Tsuu T'ina Nation Police Services

Saskatchewan (13)
Caronport Police Service
Dalmeny Police Service
Estevan Police Service
File Hills First Nations Municipal Police Service
Luseland Police Service
Moose Jaw Police Service
Prince Albert Police Service
Regional Municipality of Wilton Police Service
Regina Police Service
Regional Municipality of Corman Park Police Service

Saskatoon Police Service
Vanscoy Police
Weyburn Police Service

Manitoba (11)
Altona Police Service
Brandon Police Service
Morden Police Service
Regional Municipality of Springfield Police Services
Dakota Ojibway Police Service
Rivers Police Department
St. Anne Police
Victoria Beach Police Service
Whitehead Police Departent
Winkler Police Service
Winnipeg Police Department

Ontario (64)
Akwesaasne Police Service
Amherstburg Police Service
Anishinabek Police Service
Aylmer Police Service
Barrie Police Service
Belleville Police Service
Brantford Police Service
Brockville Police Force
Chatham-Kent Police Service
City of Kawartha Lakes Police Service
Cobourg Police Service
Cornwall Community Police Service
Dryden Police Service
Deep River Police Service
Durham Regional Police Service
Espanola Police Service
Gananoque Police Service
Kingston Police Force
Greater Sudbury Police Service
Guelph Police Service
Halton Regional Police Service
Hamilton Police Service
Hanover Police Service
Lac Seul Police Force
LaSalle Police Service
London Police Service

Midland Police Service
Mnjikaning (Rama)
Nation of Nishnawbe-Aski Police Service
Niagara Parks Police Service
Niagara Regional Police Service
North Bay Police Force
Orangeville Police Service
Ottawa Police Service
Owen Sound Police Service
Peel Regional Police
Pembroke Police Service
Perth Police Service
Peterborough Lakefield Community Police Service
Port Hope Police Service
Sarnia Police Service
Saugeen Shores Police Services
Sault Ste. Marie Police Service
Shelburne Police Services
Six Nations Police Service
Smith Falls Police Service
South Simcoe Police Service
St Thomas Police Service
Stirling-Rawdon Police Services
Stratford Police Service
Strathroy-Caradoc Police Service
Thunder Bay Police Service
Timmins Police Service
Toronto Police Service
Treaty Three Police Service
United Chiefs and Councils of Mnidoo Mnising Anishnaabe Police Service
Waterloo Regional Police Force
West Grey Police Service
West Nipissing Police Service
Wikwemikong Tribal Police Service
Windsor Police Service
Wingham Police Service
Woodstock Police Service
York Regional Police

Quebec (59)
Corps de Police des Abénakis (Odanak Wolinak)
Eagle Village Police Force
Eastmain Police Service
Eeyou Eenou Police Force (Chisasibi)

Gesgapegiag Police Service
Kahnawake Mohawk Peacekeepers
Kativik Regional Police Force
Kitigan Zibi Anishinabeg Police Force
Listuguj Police Department
Obedjiwan First Nations
Naskapi Police Service
Nemaska Police Service
Oujé-Bougoumou Police Service
Police Essipit
Police de Manawan
Police de Pikogan
Régie de Police de Memphremagog
Régie Intermunicipale de Police de Roussillon
Régie Intermunicipale de Police Richelieu-St. Laurent
Régie Intermunicipale de Police Thérèse-de Blainville
Sécurité Publique de la MRC des Collines-de-l'Outaouais
Service de la Sécurité Publique de la Ville de Repentigny
Sécurité Publique de Mashteuiatsh
Sécurité Publique de Pessamit
Sécurité Publique de Uashat Mak Mani-Utenam
Sécurité Publique Opticiwan
Service de la Protection des Citoyens de Laval
Service de la Sécurité Publique – Ville de Mascouche
Service de la Sécurité Publique de Trois-Rivières
Service de la Sûreté Municipale de Thetford Mines
Service de Police de Chateauguay
Service de Police de la Ville de Blainville
Service de Police de la Ville de Bromont
Service de Police de la Ville de Gatineau
Service de Police de la Ville de Granby
Service de Police de la Ville de Levis
Service de Police de la Ville de Montréal
Service de Police de la Ville de Mont-Tremblant
Service de Police de la Ville de Québec
Service de Police de la Ville de Sainte-Marie
Service de Police de la Ville de Saint-Georges
Service de Police de la Ville de Sherbrooke
Service de Police de Lac Simon
Service de Police de l'Agglomération de Longueuil
Service de Police de L'Assomption Saint-Sulpice
Service de Police de Mirabel
Service de Police de Pakua Shipi
Service de Police de Saint-Eustache

Service de Police de Saint-Jean-sur-Richelieu
Service de Police de Saint-Jérôme
Service de Police de Terrebonne
Service de Police de Wemotaci
Service de Police Régionale de Deux-Montagnes
Service de Sécurité Publique de Saguenay
Service Policier Wendake
Timiskaming Police Service
Waskaganish Police Service
Wemindji Cree Police Service
Whapmagoostui Police Service Baie Comeau

New Brunswick (9)
Bathurst City Police
BNPP Regional Police
Edmonston Police Force
Fredericton Police Force
Grand Falls Police Force
Miramichi Police Force
Rothesay Regional Police Force
Woodstock Police Force
Saint John Police Force

Nova Scotia (11)
Amherst Police Department
Annapolis Royal Police Department
Bridgewater Police Department
Cape Breton Regional Police Service
Halifax Regional Police Service
Kentville Police Service
New Glasgow Police Service
Springhill Police
Stellarton Police Service
Truro Police Service
Westville Police Service

Prince Edward Island (3)
Charlottetown Police Department
Kensington Police Department
Summerside Police Department

Provincial Services (3)

Ontario Provincial Police
Sureté du Québec
Royal Newfoundland Constabulary

Federal Services (2)

Royal Canadian Mounted Police
Canadian Forces Military Police

(Source: http://www.policecouncil.ca/contact/recruitment-strategy-consulting/)

Appendix F: Text of Letter of Invitation to Chiefs of Police to Participate in

Survey

Dear Chief _____,

I am writing to you with an invitation for your police service to support research on police decision making. During my 17 years of experience working in planning and research with a medium sized police service, my contributions to national police sector initiatives, and now as an academic, I have always been concerned with the preparation of police officers for their important role as decision makers. As part of the research for my PhD thesis I am conducting an online survey of front line Canadian police officers. The survey will provide police context that can then be compared to existing decision making models. The goal is to develop/adapt a model that will complement the police context and form the basis for education and training of police officers regarding front line decision making. All services and individuals who wish to receive feedback will be contacted when the report is available.

I request that you email the following invitation to the front line officers of your Patrol Division(s) to request their participation in this research:

> Subject: Research Participation Request for Front Line Police Decision Making
>
> As police officers you are continuously required to make decisions in the field. Your ability to critically review the available information and arrive at a supportable judgment and decision is extremely important as many of your decisions carry large consequences impacting the rights, freedom, and safety of society and individuals. There is a need for research on front line police decision making. You are invited to participate in a research initiative that will explore decision making competencies for front line policing. This research includes an online survey of front line uniform police officers regarding decision making in situations of limited time and resources.
>
> The survey can be accessed through the following link: http://play.psych.mun.ca/surveys/sbt/. The survey will take about 20 minutes to complete. If you are interested in taking part in the survey but have questions, please contact the researcher, Sharon Barter Trenholm, via email at sbartertrenholm@mun.ca. Participation in the survey is voluntary, is in no way connected to your employment with your police service, and your participation (or lack thereof) will not be known by your service or supervisors or affect your employment with your police service in any way. The information gathered will be anonymous and confidential. Only aggregate information will be reported.

If you would like to discuss this research initiative, please contact me. Thank you for your consideration of this request.

Sincerely

Sharon Barter Trenholm

Appendix G: Password Request Process, Informed Consent, and Survey Text

Frontline Police Decision-Making

Thank you for agreeing to complete this survey about decision-making by frontline police officers. Before you start the survey, you will require a password. Please enter your email address in the space provided to receive a password.

| | send me a password |

Once you have your password, you can enter it here.

| | Begin |

Informed Consent Form

You are invited to participate in a research project entitled: *The role of critical thinking in frontline police decision-making*. This form is part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. It also describes your right to withdraw from the study at any time. In order to decide whether you wish to participate in this research study, you should understand enough about its risks and benefits to be able to make an informed decision. This is the informed consent process. Take time to read this carefully and to understand the information. Please contact the researcher, Sharon Barter Trenholm, if you have any questions about the study or require more information.

Introduction

As part of my Interdisciplinary PhD thesis, I am conducting research under the supervision of Dr. Brent Snook (Psychology), Dr. Kara Arnold (Business), and Dr. Vernon Curran (Education, cross-appointed to Medicine). I am also a lecturer in the Police Studies Major in the Bachelor of Arts program at Memorial University. This return to academia comes after 17 years in planning and research with a medium sized Canadian police service.

Purpose of study

This study aims to collect information from police officers across the country regarding their decision-making during critical incidents, and collect information about their experience and opinions regarding training received on decision-making. This information will provide the necessary context to begin integrating research from related areas with what we know about police decision-making.

What you will do in this study

You will be asked to answer questions on frontline police decision-making, based on your own experiences. Some of the questions will require you to order categories, while others will require short typed statements about your experiences. You will also be asked to answer some questions about yourself and your policing experience.

Time to complete

This survey should take around 20 minutes to complete.

Withdrawal from the study

Your participation in this survey is entirely voluntary, is in no way connected to your employment with your police service, and your participation (or lack thereof) will not be known by your service or supervisors or affect your employment with your police service in any way. At any point during the survey you have the right to not answer any questions or to withdraw with no penalty whatsoever. You will have the option at the end of the survey to either confirm your consent or to withdraw from the study.

Possible benefits

Personally, you will be provided an opportunity to reflect on your decision-making relating to incidents you have experienced. Reflection can lead to improved decision making through improved critical thinking.

Generally, your participation in this survey will contribute toward the research on police decision-making. Your responses will provide the context necessary to advance the decision making research in the police realm. The findings can lead to improvements in the decision-making preparation of recruit police officers and the continuing education of experienced police officers. The resulting benefits to society will be improved protection of individuals' rights and freedoms and improved functioning of the justice system.

Possible risks

One of the ways we make improvements is by reviewing and learning from our mistakes. If you reflect on a situation that you feel you mishandled, this may lead to some stress. If the stress becomes uncomfortable, you can end the survey. If the stress continues, you are encouraged to contact the employee assistance program of your agency.

Confidentiality, Anonymity and Storage of Data

Confidentiality is ensuring that identities of participants are accessible only to those authorized to have access, and anonymity is a result of not disclosing participants' identifying characteristics (such as name or description of physical appearance). The data collected in this survey are coded with a number that is not associated with your email address and therefore all data are anonymous and confidential. The data will be used only by Sharon Barter Trenholm for the purpose of research publications, conference presentations, or teaching material. The data that is obtained will be stored in password protected devices. The consent forms will be stored separately from the survey results, so that it will not be possible to associate a name with any given set of responses. Please do not put your name or other identifying information in the survey responses. The email addresses will be stored separately and destroyed once the research is complete and you have been advised, if you indicated your wish to be, that the report is available.

Reporting of Results

The data collected will be used for the researcher's PhD thesis and potentially for journal article(s) and conference presentation(s). The data will be primarily reported in aggregate form, so that it will not be possible to identify individuals. Any quotations reported from the survey will be stripped of all identifying information (incident specifics, location, etc.).

Sharing of Results with Participants

A report will be written on the results of the survey. Please contact Sharon Barter Trenholm if you would like a copy of the group results.

Questions

You are welcome to ask questions at any time during your participation in this research. If you would like more information about this study, please contact: Sharon Barter Trenholm at sbartertrenholm@mun.ca.

The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in Human Research and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research (such as the way you have been treated or your rights as a participant), you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at 709-864-2861.

Consent

Once you have completed reading this form, you will be asked to enter the password sent to you via your provided email address. Entry of the password means that you are agreeing to participate in this survey and that:

- You have read the information about the research.
- You have been able to ask questions about this study.

- You are satisfied with the answers to all your questions.
- You understand what the study is about and what you will be doing.
- You understand that you are free to withdraw from the study at any time, without having to give a reason, and that doing so will not affect you now or in the future.

  Withdrawal is only possible up until the survey is submitted, as it will be anonymous and therefore unable to be removed after submission.

- You understand that any data collected from you up to the point of your withdrawal will be destroyed.
- If you enter your password, you do not give up your legal rights and do not release the researchers from their professional responsibilities.

You can print a copy of this Informed Consent Form for your records.

Please, click the button below if you agree with the following statements:

- I have read and understood what this study is about and appreciate the risks and benefits. I have had adequate time to think about this and had the opportunity to ask questions and have my questions answered.
- I agree to participate in the research project understanding the risks and contributions of my participation, that my participation is voluntary, and that I may end my participation at any time.
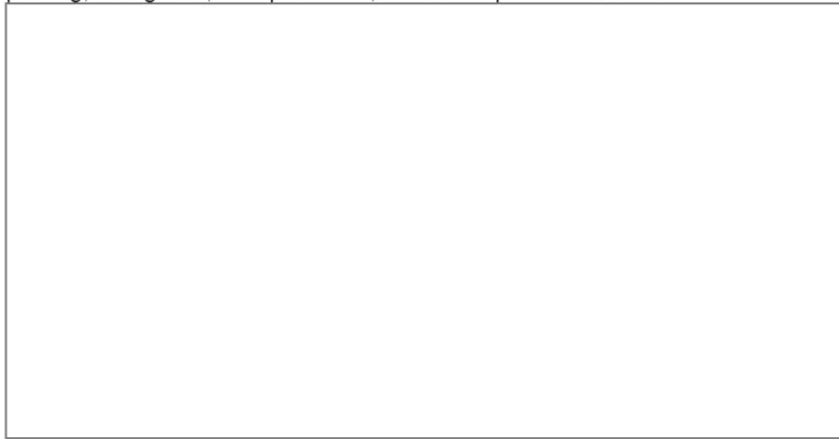
start

If not, you can withdraw from the study by leaving this page.

Section 1

Thank you for agreeing to participate in this survey. As you answer the questions, I want you to think about incidents during your policing career when you had to choose an action, but the solution(s) were not obvious, you did not have a lot of time to consider the solution, and there were significant potential consequences for those present with you.

Please describe how you would typically make a decision in this type of frontline policing, ambiguous, time-pressured, and consequential situation.

next section

Section 2

Based on your own experience, please rank the following 6 categories of offences from most (1) to least (6) challenging from a decision-making perspective. (If you have not dealt with an incident type, assign it a 0.)

		have not dealt with	most challenging					least challenging
		0	1	2	3	4	5	6
1	Violent crime (e.g., homicide, assault, firearms, robbery, harassment, threat)	○	○	○	○	○	○	○
2	Property crime (e.g., breaking and entering, theft, fraud, mischief, arson)	○	○	○	○	○	○	○
3	Other Criminal Code offences (e.g., counterfeiting, weapons violation, child pornography, prostitution, terrorism, disturbing the peace)	○	○	○	○	○	○	○
4	Criminal Code traffic violations (e.g., impaired driving, other CC traffic violations)	○	○	○	○	○	○	○
5	Drug offences (e.g., possession, trafficking, production, distribution)	○	○	○	○	○	○	○
6	Other federal statute violations	○	○	○	○	○	○	○

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(e.g., Youth Criminal
Justice Act)

Section 3

Based on your own experience, and considering your decision-making perspective, please indicate your level of agreement on the following 3 statements.

		strongly disagree	disagree	neutral	agree	strongly agree
		1	2	3	4	5
1	Responding to domestic dispute calls is challenging.	○	○	○	○	○
2	Responding to calls involving intoxicated persons is challenging.	○	○	○	○	○
3	Responding to calls involving persons in mental health crisis is challenging.	○	○	○	○	○

Please add any other challenging categories of incidents you have experienced, and explain what makes each of these additional incidents challenging for decision-making.

next section

Section 4

Based on your own experience, and considering your decision-making perspective, please indicate your level of agreement on the following 15 statements.

		strongly disagree	disagree	neutral	agree	strongly agree
		1	2	3	4	5
1	Actions of a subject are a high priority of consideration.	○	○	○	○	○
2	Availability of cover is a high priority of consideration.	○	○	○	○	○
3	Availability of equipment is a high priority of consideration.	○	○	○	○	○
4	Availability of back up is a high priority of consideration.	○	○	○	○	○
5	Timing of back up is a high priority of consideration.	○	○	○	○	○
6	Distance separating subject from other people is a high priority of consideration.	○	○	○	○	○

		strongly disagree	disagree	neutral	agree	strongly agree
		1	2	3	4	5
7	Information from dispatch is a high priority of consideration.	○	○	○	○	○
8	Information from initial view of situation is a high priority of consideration.	○	○	○	○	○
9	Location (i.e., in public or behind closed doors) is a high priority of consideration.	○	○	○	○	○

		strongly disagree	disagree	neutral	agree	strongly agree
10	Media presence is a high priority of consideration.	○	○	○	○	○
11	Media reporting is a high priority of consideration.	○	○	○	○	○
12	Potential for injury to any one on scene is a high priority of consideration.	○	○	○	○	○

		strongly disagree	disagree	neutral	agree	strongly agree
		1	2	3	4	5
13	Pressure from public is a high priority of consideration.	○	○	○	○	○
14	Pressure from supervisors is a high priority of consideration.	○	○	○	○	○
15	Pressure from Crown Attorneys is a high priority of consideration.	○	○	○	○	○

Please add any other situational characteristics you would consider a high priority, and explain what makes each of these additional characteristics important.

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Section 5

Based on your own experience, and considering what you find helpful when making a decision, please indicate your level of agreement on the following 13 statements.

		strongly disagree	disagree	neutral	agree	strongly agree
		1	2	3	4	5
1	Breaking the process into sub-goals is helpful.	○	○	○	○	○
2	Information from dispatch is helpful.	○	○	○	○	○
3	Information from the public is helpful.	○	○	○	○	○
4	Information from police records is helpful.	○	○	○	○	○
5	Knowledge about a specific person gained from firsthand previous experience is helpful.	○	○	○	○	○
6	Knowledge about a specific person related by colleagues is helpful.	○	○	○	○	○

		strongly disagree	disagree	neutral	agree	strongly agree
		1	2	3	4	5
7	Knowledge about a similar situation gained from firsthand previous experience is helpful.	○	○	○	○	○
8	Knowledge about a similar situation related by colleagues is helpful.	○	○	○	○	○
9	Legal guidance is helpful.	○	○	○	○	○
10		○	○	○	○	○

Listening to what is being said, including volume & voice cues is helpful.

11	Observing body language is helpful.	○	○	○	○	○
12	Playing out scenarios in your mind is helpful.	○	○	○	○	○
13	Policy and procedures of your police service are helpful.	○	○	○	○	○

Please add any other techniques or information you would consider helpful when making a frontline police decision, and explain how these are helpful.

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Section 6

Please describe, in as much detail as possible, any techniques or information you use in your frontline decision making that you have learned through training.
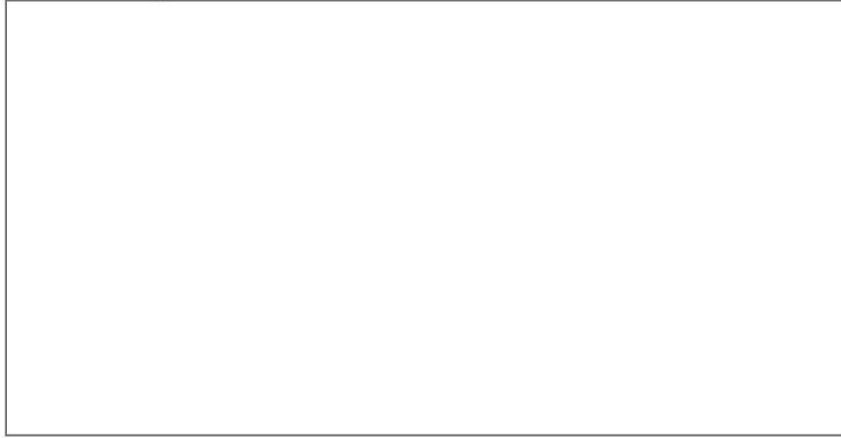
Please describe, in as much detail as possible, any techniques or information you use in your frontline decision making that you have learned through experience.

Please provide any suggestions on how to improve the preparation of officers for decision making in the field.

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Section 7 — Demographic Information

1. What is your gender?

2. What is your age?

3. How many years have you been employed as a police officer?

4. What is your highest level of education received?

5. What is your rank?

next section

Frontline Police Decision-Making

Confirm Your Consent

Do you consent to your answers being used in this study?

    ◯ yes, submit data

    ◯ no, withdraw from study

| next section |

Thank you

Your responses to this survey provide police context that will be combined with existing decision making models to develop an approach that will form the basis for education and training of police officers regarding front line decision making. Thank you for your time and valuable input.

Please contact Sharon Barter Trenholm (sbartertrenholm@mun.ca) if you would like a copy of the survey results. Upon completion, the thesis will be accessible to the public at Memorial University's Queen Elizabeth II Library.

Appendix H: Survey Descriptive Data

The survey results were graphically depicted in Chapter 4. To avoid repetition in the text, but for the information of the reader who may wish to explore the results in more numerical detail, the descriptive data are presented in the following tables.

Table H.1: *Ranking of Challenge Level for Offence Categories*

Offence Category	*M* (*SD*)	*Mdn*	0 Have not dealt with %	1 Most challenging %	2 %	3 %	4 %	5 %	6 Least challenging %
Violent crime	2.18 (1.49)	2	1	46	21	13	6	9	4
Other Criminal Code offences	2.96 (1.40)	3	0	15	28	25	15	11	5
Drug offences	3.08 (1.51)	3	3	13	22	25	14	18	4
Criminal Code traffic violations	3.79 (1.54)	4	1	5	19	18	18	25	15
Other Federal statute violations	3.86 (1.62)	4	4	5	12	20	17	26	17
Property crime	4.11 (1.22)	4	0	0	11	23	27	25	15

Table H.2: *Levels of Agreement for Challenge When Responding to Calls Involving Domestic Disputes, Intoxicated Persons, and Persons in Mental Health Crisis*

Call Type	M (SD)	Mdn	Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %
Intoxicated persons	3.11 (0.99)	3	4	29	25	38	4
Domestic disputes	3.83 (0.93)	4	1	10	18	47	24
Persons in mental health crisis	4.17 (0.86)	4	1	4	11	44	39

Table H.3: *Situational Characteristics Levels of Agreement*

Situational Characteristic	M (SD)	Mdn	Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %
Potential for injury to any one on scene	4.79 (0.47)	5	0	0	3	16	82
Actions of a subject	4.70 (0.51)	5	0	0	3	25	73
Distance separating subject from other people	4.57 (0.53)	5	0	0	2	39	59
Information from initial view of situation (113)	4.42 (0.66)	5	0	0	10	39	51
Availability of back up (112)	4.38 (0.76)	5	0	4	6	38	52
Timing of back up (113)	4.34 (0.77)	4	0	4	8	40	49
Availability of equipment	4.32 (0.76)	4	0	3	10	41	46
Information from dispatch	4.26 (0.85)	4	2	2	11	40	46
Availability of cover (112)	4.20 (0.86)	4	0	4	15	37	44
Location (i.e., in public or behind closed doors)	4.19 (0.77)	4	0	2	17	42	39
Pressure from supervisors	3.29 (1.03)	3	7	13	32	40	8
Pressure from public	2.92 (1.10)	3	11	25	30	29	5
Media presence	2.87 (1.01)	3	10	24	42	19	5
Pressure from Crown Attorneys	2.85 (1.02)	3	11	23	39	24	4
Media reporting	2.79 (1.10)	3	13	27	33	20	6

Table H.4: *Decision-Making Techniques/Information Levels of Agreement*

Techniques/ Information	M (SD)	Mdn	Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %
Knowledge about a specific person gained from firsthand previous experience (113)	4.66 (0.49)	5	0	0	1	32	67
Observing body language (113)	4.58 (0.59)	5	0	1	3	35	62
Knowledge about a similar situation gained from firsthand previous experience	4.53 (0.64)	5	0	2	3	37	59
Knowledge about a specific person related by colleagues	4.32 (0.64)	4	1	0	4	56	39
Information from police records (113)	4.31 (0.63)	4	0	1	6	54	39
Listening to what is being said, including volume & voice cues (113)	4.27 (0.69)	4	0	2	9	50	39
Playing out scenarios in your mind (113)	4.23 (0.74)	4	0	3	11	48	39
Information from dispatch	4.11 (0.76)	4	0	5	8	57	30
Knowledge about a similar situation related by colleagues	4.03 (0.62)	4	0	2	12	68	18
Information from the public (113)	3.97 (0.69)	4	0	2	19	58	20
Legal guidance (112)	3.88 (0.78)	4	2	3	19	60	17
Policy and procedures of your police service	3.75 (0.80)	4	1	5	26	53	15
Breaking the process into sub-goals	3.36 (0.95)	4	4	15	32	42	8