

Master of Science in Leadership and Organizational  
Psychology

Preliminary thesis report. Interpreting behavioral  
cues in police encounters: theory vs. practice

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## **Summary**

This preliminary thesis report describes the basis for our master thesis, related to the cues in police-citizen encounters. The paper aims at describing the potential benefits and shortcomings of intuitive decision making often used in police work. It explores the notion of situation awareness (SA) as a useful theory for understanding the cognitive mechanisms involved in this type of decision making. Gibson's affordances is identified as a potentially important framework for understanding how action opportunities can be created and police performance enhanced. Further, the background theory of cues, as well as their significance on situation awareness and prediction of outcomes is presented through a case study of British officers. The report also uncovers the possible limitations of cues as prerequisite for performance, noting the pitfalls of automatic cognitive processing as well as the threat of systematically ingraining cues as a guaranteed sign that a threat is present, which may contribute to reinforcing feedback loops that lead to the unnecessary escalation of violence when such measures are inappropriate. Furthermore, the possibility for improving police training doctrine is suggested pending the results of this research. Finally, the research method and the master thesis progression plan are described.

## **Introduction to the research topic**

There is limited existing research that investigates the cognitive processes involved in dynamic, high-stress police encounters (Boulton & Cole, 2016). Our research aims to expand the understanding of this topic by exploring what the most important factors are that influence outcomes of high-stress police encounters. The theoretical basis of our current understanding of the topic includes concepts related to situation awareness, cues, affordances, mental models, and intuitive decision making. At this stage of our investigation, the theory of situation awareness as denoted by Endsley (1987) is highly compatible with these other concepts and is useful for categorizing theories that are relevant to police interactions and decision making in situations involving uncertainty. A notable inference we have made so far is that the recognition of cues in the environment is a significant component in this framework, as it is the key mechanism that frames these situations in officers' minds, which strongly influences which action patterns are subsequently followed. Under the right circumstances, this intuitive process could increase the probability of attaining ideal outcomes during police encounters, namely increasing officer's survivability in the presence of a threat. The potential benefits and potential shortcomings of this automatic processing calls for further exploration of the topic; the anticipation of future events can help officers plan for these contingencies and maintain an upper hand in dynamic situations, however, there is also evidence that these same mechanisms can be lead to faulty decision making when cues are misinterpreted, leading to an officer making wrong assumptions based on an incomplete understanding of the situation at hand. More research is needed to understand the significance of cues as they apply to officer's performance in the line of duty. Therefore, our research question is:

*How does the recognition of cues help or inhibit police officer's ability to make appropriate decisions in uncertain, complex situations?*

## **Literature review and objectives of the thesis**

## **Situation awareness**

Endsley (1995) defines situation awareness (SA) as “the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future” (Endsley, 1995, p. 36). As it relates to police work, officers who have good SA during an encounter might be better equipped to respond to an escalating situation because they are able to anticipate a potential threat beforehand, affording them a better chance to take appropriate measures that increase the likelihood of achieving of an optimal outcome. In this way, SA integrates an individual’s comprehension of a situation as a whole and is the basis for decision making. Endsley (1995) categorizes three sequential components of SA that will henceforth be referred to as level 1, 2, and 3, respectively; perception of elements in the environment, comprehension of current situation, and projection of future status. When faced with high stakes situations that are both complex and uncertain, officers can benefit from having a more flexible mindset that gives them a better understanding of when certain scripts are called for or not; adaptive expertise allows them to recognize shifts in the situation that call for adapting to new demands in the environment (Wiltshire, Neville, Lauth, Rinkinen, Ramirez, 2014). Adaptive flexibility is thought to be a distinguishing factor of experienced operators and consists of their ability to understand when and which procedures are called for, recognizing shifts in a situation that call for adaptation, recognition of cues, and the rapid selection and execution of appropriate tactical changes (Boulton & Cole, 2016). Complementing this, Boulton & Cole (2016) propose that expertise in this context is defined by the ability to flexibly adapt responses to situational changes under high demand, rather than being determined by intuitive or analytic processing alone. In this way, adaptive flexibility allows for these individuals with good SA to adopt action patterns that create a larger set of available actions from them to choose from and decreasing the number of constraints that limit their options.

## **Gibson's affordances**

Gibson's (1955) concept of affordances provides another framework for understanding the usefulness of SA as it relates to adaptive flexibility; affordances can be understood as available action paths that can provide new paths of action, or as sequences of action that create opportunities for more actions, and their existence is conditional on existing constraints (Greeno, 1994). Those conditions are the properties of the agent (in this context, an officer's attention, awareness of cues, available mental models) as well as properties of the system (situational features such as spatial and temporal factors i.e. availability of cover, distance from threat), and constraints, which refer to properties of the system that limit available actions. Affordances can be conceptually applied to the concept of adaptive flexibility in that they are the available actions an officer can perform to achieve a desirable outcome (apprehending suspect and/or surviving encounter). Their ability to take advantage of these affordances depends on if they properly perceive and/or recognize symbols that represent the likelihood that certain constraints will be soon introduced into the environment. In practical terms an officer will be afforded more options if they are able to recognize cues that foreshadow an incoming threat, helping them to avoid constraints that would be imposed on them if they continued their current path. This concept, as well as that of "handlingsrom" or could prove useful in understanding our topic, and will be explored further as our research progresses.

## **Cues**

The useful outcome of good SA –projection of future events- is dependent on the individual's recognition of key features of the environment, so-called *critical cues*; these cues help the individual to choose a mental model that is appropriate for the demands of the situation (Endsley, 1995). These cues can manifest in many forms, but they are often used to refer to specific behaviors or phenomenology exhibited by individuals of suspect in the context of police interactions. The Recognition-Primed Decision (RPD) model (Klein, 1993) claims that experts recognize critical cues that are related to past experiences, which are thought to aid decision making and reduce cognitive demands by focusing their attention to the most important details in a

situation (Fiore, Ross & Jentsch, 2012; Loveday et al., 2013). Cues are important in both SA and RPD conceptualizations because this environment input largely determines which mental models are chosen, forming the basis of which actions the officer might subsequently take; mental models (referred to as cognitive schemata by Endsley, 1995) allow individuals to match their current circumstances to prototypical situations, each which correspond to a set of correct responses (Boulton & Cole, 2016). For example, Boulton and Cole's (2016) case study of British officers involved in violent encounters found that officers used audio, visual, and intelligence feeds to inform their expectations of which tactical procedures might be called for; these officers denoted this process as "contingency planning" (p. 300). In this way, the officers were able to anticipate future states (level 3 SA) because of their comprehension of meaningful cues (level 2 SA), which were made salient to them because of their attention to environmental conditions (level 1 SA).

When environmental conditions that have certain properties are detected, these features are given further attention on the basis of pre-established characteristics that the individual is scanning for (Neisser, 1967). An individual's goals can direct the search for certain information in an environment. Endsley (1995) refers to Casson's (1983) concept of top-down and bottom-up decision making processes, which operate simultaneously as an individual gathers SA; however, these goals exist in a conditional hierarchy which prioritizes certain goals over another depending on situational demands. In the case of police officers, their current goals will guide the type of characteristics being searched for in an environment; investigating a possible crime will call for a search of certain characteristics related to the type of crime suspected (top down process), meanwhile, their inherent desire to survive an encounter will promote searching for cues that denote a threat, and their presence will call for a revision of plans that prioritizes actions related to dealing with the immediate threat rather than enforcing a particular law (bottom-up decision process). For example, a police officer whose current goal is to investigate if a driver is intoxicated will search for characteristics that would confirm this suspicion, while also searching for behavioral or contextual cues of a potential threat, thereby satisfying their goal of not being harmed; if any cues that denote a threat are noticed, this primary goal will dictate that the officer's actions should be oriented towards

mitigating danger. This is reminiscent of the concept within Naturalistic Decision Making (NDM) of an expert having an “in-built prioritization” method of determining which cues are searched for in the environment (Seamster, Redding, Cannon, Ryder & Purcell, 1993). It can be assumed that in practical terms, a police officer’s goal of avoiding mortal harm is rarely superseded by their goal of enforcing a particular law (with obvious exception given to selfless acts performed in the line of duty during exceptional circumstances), and therefore is always active; this goal of survival calls for constant search for cues that indicate the presence of a threat regardless of what other goals might be active. Consequently, police are understandably hypervigilant in the search for these cues during encounters.

Preliminary evidence stemming from our review of various samples of law enforcement training material as well as the semi-structured interviews we have conducted with police officers so far indicate that it is common among police officers to infer cues of a potential threat exist based on the behavior, mannerisms, and/or somatic changes that are displayed by suspicious individuals who they are interacting with. There exists a wealth of research on phenomenology of behavioral and somatic markers that are widely assumed by police to be reliable cues, some which are corroborated by studies on cues of deception (DePaulo et al., 2003) and nonverbal predictors of violence (Johnson, 2015; Johnson, 2017; Johnson & Aaron, 2013) to name very few. Alternatively there is research that undermines these assumptions by demonstrating how police may not be as adept at judging innocence or guilt in face-to-face encounters (Strömwall & Granhag, 2003), and how officer’s misattributions of cues can escalate encounters with individuals unnecessarily (Khan, McMahon & Stewart, 2017; Steele & Aronson, 1995). Furthermore, our preliminary research has shown that among law enforcement training programs, there is little consistency in regard to the range, number, and categorization of the types of cues that meant to be integrated into officers’ semantic memory. Therefore, one of the goals of our research is to better understand how and when these cues are manifested in suspect’s behavior, estimate their relative validity in different contexts, and identify the circumstances when their interpretation could afford police greater maneuverability or instead sabotage good intentions.

## **Mental models, schema, and scripts**

Cues are significant factor that influences an officer's ability to select and execute an effective problem solving strategy for a given situation because they give officers a subjective definition of what type of interaction is taking place and signify what their parameters of available options they have to choose from; once identified, these cues determine which mental model is most appropriate to adopt, which in turn influence how a situation is conceptualized, or framed (Manktelow & Jones, 1987). In this context, mental models are "mechanisms whereby individuals are able to generate descriptions of system purpose and form, explanations of a system functioning and observed system states" (Rouse & Morris, 1985, p. 7).

Complex situations like those found in police encounters can easily surpass an officer's attention capabilities due to information overload (Lord & Saenz, 1985) and stress (Cohen, 2011). For instance, Boulton and Cole (2016) found that officers were found to be more likely to unholster and discharge their weapons as a result of increased external demands. The advantage of using mental models in the context of police work is that a situation does not need to exactly resemble previous encounters because of the process of categorization mapping, which is the fitting the characteristics of the present situation to those of a known prototype; this process allows for the expediting the decision making process due to humans' highly developed pattern-matching capabilities (Endsley, 1995). An individual's working memory (responsible for short-term storage and retrieval) is tasked with the simultaneous processing of environmental stimuli, formulating and selecting responses, and carrying out actions, which is why some have suggested that working memory is the main bottleneck for SA (Fracker, 1987). Highly complex situations can be condensed into an easily accessed framework for understanding information in the form of *cognitive schema* (Mayer, 1983, as cited in Endsley, 1995). Certain types of schema described as *scripts* provide patterns of action for various tasks (Schank & Abelson, 1977). These scripts are helpful for reducing cognitive load because an individual does not need to formulate unique patterns of action for every situation, but can instead rely on automatic processing to respond to a similar situation based on its appropriate script (Endsley, 1995). Individuals who have experience and

knowledge are able to discern which cues to pay attention to and unconsciously make decisions based on this intuition (Dreyfus & Dreyfus, 1980). Intuition, as defined by Burke and Miller (1999) as the “cognitive conclusion based on a decision-maker's previous experiences and emotional inputs” (p. 92). Using these long-term memory stores as the basis of mental models and their associated scripts can significantly increase an individual's processing speed and reaction time by allowing for single-step, “recognition-primed” decision making that begins once critical cues are noticed and categorized according to past experiences (Klein, Calderwood & Clinton-Cirocco, 1986; Klein, 1993). Although some information is lost when coded in this way, environmental stimuli become more ordered and comprehensible, aiding in faster retrieval and processing times and enhances performance when appropriately aligned with the situation at hand (Mayer, 1983; Endsley, 1995). In support of this theory, Klein (1989) found that most experts mostly did not rely on conscious deliberation to identify alternative solutions, but rather focused on classifying the situation to more readily acquire an appropriate response from memory. Officers who are trained to apply intuition more effectively by using cues to shape their actions might contribute to reducing stress associated with decision-making, and increase effectiveness (Brown & Daus, 2013).

### **Limitations of cues as a prerequisite for performance**

The cognitive processes involved in the RDM strategy can be compared to other theories related to simplifying heuristics (Kahneman & Klein, 2009); the framing of the situation influences how the problem is perceived and what actions are thought to be called for. This process can be described as system 2 thinking (Kahneman, 2011, as cited in Pentland & Hærem, 2015), which aids in faster processing, although the dependence on heuristics and automatic processing does introduce the risk of the officer making biased decisions (Kahneman, Slovic, & Tversky, 1982) that are ultimately uncalled for in the context of the current situation. The primary hazard created by automatic cognitive processing is the increased risk of being less responsive to new stimuli, since automatic processes normally do not rely on feedback (Logan, 1988, as cited in Endsley, 1995). In this way, incomplete or faulty comprehension of environmental factors can lead to an improper selection of a script

that does not match the demands of the environment, leading to unnecessary escalation of violence.

The cues that are commonly emphasized in law enforcement training material as being important for anticipating a threat are the subset of cues related to behavior and somatic signals (Johnson, 2015; Johnson, 2017; Johnson & Aaron, 2013). However, a study by Kahn et al. (2017) suggests that many of these cues overlap with the same symptoms of stereotype threat. Stereotype threat (Steele & Aronson, 1995) occurs when a person feels they may be judged negatively in an encounter based on stereotypes, resulting in increasing the person's anxiety, physiological arousal, and a decrease in cognitive capacity (Lord & Saenz, 1985). An individual who is experiencing stereotype threat might provide delayed, incomplete, and or inaccurate responses to police questioning (Steele & Aronson, 1995), thereby increasing an officer's suspicion and further increasing the chance of escalation (Kahn et al., 2017). To a police officer who is searching for cues that could help them anticipate a threat, a person's (a racial minority in particular) demeanor may align with cues that suggest an attempt to conceal deception; once the situation is framed as being a potentially violent encounter, the officer's intuition leads them to adopt a mental model that involves anticipating an impending threat and taking appropriate actions, such as placing their hand on their gun. In response to this, the individual they are interacting with becomes more anxious, sending the officer more cues that reinforce their assumption that a threat is present. Compounding this, stress incurred under these circumstances can interfere with memory processes and cognitive performance of the police officer, further limiting their decision making abilities that are already hindered by framing and confirmation biases. This positive feedback loop can lead to the situation escalating to a point when the use of lethal force that seems appropriate under the circumstances but is ultimately revealed to be unwarranted (Kahn, McMahon & Stewart, 2017). Further supporting the idea that police interactions can be shaped by positive feedback loops, Binder and Scharf (1980) theorized that violent police encounters can be categorized as a "developmental process in which successive decisions and behaviors by either the police officer or citizen, or both, make the violent outcome more or less likely" (p.111). Viewing police encounters in a way that accounts for a causal, reinforcing loop involving the officer and citizen has

broad implications on how this topic might be better understood, and more attention will be given to it as our research progresses.

### **Potential implications**

It can be inferred that RPD strategies are not a stop-all solution for attaining good SA and decision making outcomes for police during high stress interactions because of the inherent shortcomings that stem from decision making traps. It has been recommended that officers be trained in skills needed to revise or reject mental models in response to a situational demand (Boulton & Cole, 2016). Researchers investigating the outcomes of SA in the context of fighter pilots suggested that performance is predicted by a combination of good SA paired with effective decision making; in this way, good SA as an important factor which contributes to higher performance, however it does not necessarily guarantee it (Venturino et al., 1989, as cited in Endsley, 1995).

As it has become clear in this paper, many of the mechanisms working in the minds of police officers can be improved through training. As our research develops and helps to better understand this topic, the findings could have implications for improving upon or adding to training curriculum that is related to the realm of intuition and flexibility. Findings by Saus and colleagues (2006) have shown that situation awareness and effective decision making can be improved using certain interactive training techniques.

In the study conducted by Boulton and Cole (2016), the significant difference between specialized firearms officers (SFOs) and authorized firearms officers (AFOs) was that the SFOs received additional training. Contrary to AFOs, SFOs reported that they heavily relied on an automated “training mode,” which allowed them for more resources being allocated to assessment of the incident, recognition of cues, and adaptation. However, in order to ensure that behavioral cues do not provoke excessive force regardless of the person’s actual intentions (Johnson, 2014), the notion of expanding on action repertoire should be included. This would assure that the suspicion of a threat would function as an indicator of the need to expand the

repertoire of choices, or a cue that the techniques applied in handling the suspect should be changed.

## **A plan for data collection and thesis progression**

### **Research method**

Considering the nature of the research problem at hand, the qualitative approach will be used because it allows for interpreting data that is not easily measured in a systematic, nominal way. Other research that has investigated similar topics to our own, such as Pais and Felgueiras (2016), based their methodology on Naturalistic Decision-Making theory (NDM), which involves ethnographic techniques, structured and unstructured interviews, retrospective analysis of critical incidents, videos of task performance, and cognitive task analysis. They explored the police officers decision making process under challenging and uncertain situations using cognitive task analysis (CTA), which could potentially be a useful method of research for our topic. In order to better understand the role of cues in the context of police interactions, our research will benefit from the review of existing video footage of real police encounters. Furthermore, we will continue to conduct semi-structured open-ended interviews with police officers.

These interviews will use of an interview guide, while also allowing for the opportunity to ask follow-up questions of emergent themes or events. The interview guide will be especially useful because the field work will be carried out by both authors of this paper in both the United States as well as Norway. Additionally, the flexibility of semi-structured interviews will allow for the sequences of the questions to be changed where natural (Bryman & Bell, 2011). The interviews will ideally be conducted face-to-face in an undisturbed neutral place. In some cases, this may not be impossible due to geographic restrictions; the solution will then be to conduct interviews through video-calls. In order to fully concentrate on the answers provided by the informants and be able to promptly form follow-up questions, we will ask informants for the permission to audio-record the interviews. The recordings will at a later stage be transcribed and coded (Bryman & Bell, 2011).

Through the reviewing of existing video footage, we will conduct a naturalistic study that will allow us for repeated and detailed analysis of conduct, interaction, and causal loops. Using the footage as an investigating tool will allow an analysis of interpersonal communication, in particular regarding the observable cues manifested in human behavior. Due to video's ability to capture a sequence of action, we should also be able to study the interaction between the police and the public, thus enriching our analysis of the topic at hand (Heath, Hindmarsh & Luff, 2010). Although not every sample of video is accompanied by a complete set of details regarding the incident, we will nevertheless be able to elucidate many valuable aspects of the interaction as they relate to our research question.

Through our method we may be able to infer what kind of training the informants have had, (which cues they take note of) their situation awareness (how attuned they seem to impending threats), and what patterns of action they adopt in response to the threat (the effectiveness of the decisions they made) Additionally, the research will explore the role of shared mental models used by police officers who operate in a team. Ultimately, any potential improvements to police training curriculum will be searched for pending the analysis of the data that has been collected. Our method will hopefully help us to identify and categorize the circumstances under which the interpretation of behavioral cues proves helpful or hurtful to the police effectiveness in uncertain and dangerous police encounters.

## **Sample**

For interviews, the sample be based on police officers that have will likely have experienced a violent encounter in their career or will at least be able to share what type of training they received as it pertains to observing and interpreting cues. Although it is in our intention to broaden the scope of the sample, it may be unfeasible to obtain a random simple sample, and it therefore follows that the sample will largely be dependent on convenience sampling of available officers who are willing to be interviewed (Bryman & Bell, 2011). The sample will likely consist of both Norwegian and American police officers. It is fair to assume that during the data collection process, the sample may be extended based on snowball sampling. None of

the authors has any direct connection with the police force, thus making an initial contact with several individuals and expanding sample to their network may prove fruitful. Although the research may not achieve high external validity due to convenience and snowball sampling, it is our belief that the some insights, such as insights about training received during police academy, may be quite universal across the population.

Due to the large body of available police footage, our sample of footage would be purposive. Although the specifics of the criteria have not yet been defined, it can be safely to assume that the sample will only consist of videos that involve a perceived threat on behalf of the suspect, whether it proves to be real or not. The video material in itself will be obtained from sources such as YouTube and other internet databases, and hopefully official training material based on anecdotal examples of prototypical situations of this type. Many of the police departments in the United States release body-camera and dash-camera footage on a regular basis which that hasn't been manipulated, edited or altered in any way.

### **Thesis progression plan**

January- February	<ul style="list-style-type: none"><li>•Further research review</li><li>•Data collection (interviews, video-footage)</li></ul>
March-April	<ul style="list-style-type: none"><li>•Data collection (interviews, video-footage review)</li><li>•Transcription of interviews</li></ul>
May	<ul style="list-style-type: none"><li>•Data analysis</li></ul>
June	<ul style="list-style-type: none"><li>•Write the first draft of the thesis</li></ul>
July	<ul style="list-style-type: none"><li>•Write the second draft of the thesis</li></ul>
August	<ul style="list-style-type: none"><li>•Write the final thesis</li></ul>

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