

# Tactical police interventions: Design challenges for situational awareness

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## ABSTRACT

Police officers' situational awareness during tactical intervention can be crucial for how they act and whether they use the correct level of force in extreme situations. This paper presents preliminary findings in ongoing research focusing on police tactical interventions and situational awareness. Twenty-one police officers were interviewed, and a video sequence of a shorter car chase was used to set the scene in the interviews. The interviewed police officers described their tactical decisions applying the standardized tactical approach applied in the Swedish police. In the analysis, a focus on how situational awareness is gained and how situational awareness is affected by tactical decisions is presented. The study indicates that the situational awareness process begins before the actual intervention (pre-intervention *phase*). During the actual intervention, situational awareness is very complex. Technology supporting police officers' cognition, as well as management and control of one or many risk areas, is identified.

## Keywords

Police, Police tactics, Situational Awareness, Tactical Intervention,

## INTRODUCTION

The Swedish police carry out around 1.4 million job interventions each year – out of which around 30 are such situations where the police will use their weapons to solve the situation. Even if the ratio between the use of firearms and all jobs assigned to the police is extremely low, there is a national ambition to further develop the Swedish police tactical approach and the tactical methods applied. Since 2004 there has been a continuous development of the general tactical approach to increase the safety of police officers. The Swedish police have five general tactical methods, aimed to give police officers a fair tactical repertoire. All these five tactical methods are developed to create a short time frame that enables the police to be aware of the situation and so have a chance to make correct decisions, and is based upon a General Tactical Explanation Model. However, there is very little research about tactical interventions from a practitioner's viewpoint. Research primarily from the US shows that interventions with suspects, in general, are very dangerous and that it is very difficult to claim that the tactical methods applied are responsible for the situations where no one is hurt. For example, thousands of room entries have a successful outcome, but it is often the suspect that chooses not to use lethal force that is the primary reason for the success (Blair & Martaindale, 2013). During tactical interventions for example, to stop a live shooting event, the time police have to make their decisions is very short, and the time to react to a threat is low. Time and distance are the key elements for police to succeed in tactical interventions (see e.g. Blair &

Martaindale, 2013; Blair & Martaindale, 2017; Martaindale, 2021; Sandel, Martaindale, & Blair, 2021).

To understand what to do and to make decisions during police interventions, situational awareness have been identified as an important ability amongst police officers. Situational awareness has, for police officers, been identified as one of the key factors for the possibility to make secure and legally correct interventions and decisions (Andersen & Gustafsberg, 2016; Andersen, Papazoglou, Nyman, Koskelainen, & Gustafsberg, 2015; O'Hare & Beer, 2020). In July 2021, a young Swedish police officer was shot dead in a suburb of Gothenburg<sup>1</sup> by a person driving by in a vehicle. This kind of extreme situation shows that often the police have limited time to react when a threat quickly arises. In the situation in Gothenburg, the police were at the scene to investigate a crime, and at the time talking to a citizen when the threat suddenly emerged. This demonstrates why situational awareness is so important, and in the extreme, it can be a matter of life and death. Situational awareness is about the cognitive process where individuals perceive and understand what is taking place in their environment (Endsley, 1995; Endsley, Jones, & Bolté, 2003). For a police officer, aggregated stress can negatively affect his/her situational awareness capacity. However, succeeding in increasing situational awareness capacity, police officers could make sounder decisions in stressful situations, such as correct use of force (shoot or not to shoot) during tactical interventions (Andersen & Gustafsberg, 2016).

In an ongoing large research effort, we are aiming to a) empirically summarize and present the General Tactical Explanation Model that serves as basis for the Swedish police tactics, b) better understand how police officers apply the General Tactical Explanation Model during tactical interventions, c) study and understand the interaction between tactics and situational awareness. In this paper, we present the preliminary findings from this research and aim to present design implications of technology that should support police officers' situational awareness capacity. The research does not focus on special police units like SWAT or Hostage Rescue Units. The research focuses on police officers working in twos in a patrol car, responding to assignments from the dispatch center, or initiating jobs on their own.

#### RELATED RESEARCH AND SITUATIONAL AWARENESS

In this research, we are interested in better understand situational awareness when it is one of the foundations in decision making and some form of performance. Situational awareness is defined as “*the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future*” (Endsley, 1988). Endsley (1988) clearly states that decision-making is separated from situational awareness, but the relationship between the two is clear. According to Endsley et al. (2003, p. 14 ), situational awareness can be broken down into three levels:

- “- Level 1 – *perception* of the elements in the environment
- Level 2 – *comprehension* of the current situation, and
- Level 3 – *projection* of future status”

Research on various technologies supporting situational awareness focuses on a longer period of time, it is rather about how to manage a crisis and/or emergency efficiently. For example, first responders (firefighters) need information for situational awareness to be studied and indicate that information can guide the success of a fire emergency response (Li, Yang, Ghahramani, Becerik-Gerber, & Soibelman, 2014). Another example is the use of social media to better understand a crisis or emergency (Snyder, Karimzadeh, Stober, & Ebert, 2019). It is very challenging to design technology for first responders that support their situational awareness. First, the three main first responders (police, firefighter, emergency medical staff) are creating situational awareness differently. For example, the police officers mostly acquire situational awareness based on behavioral observations (Sanquist, Brisbois, & Baucum, 2016). When designing technology for situational awareness, it is easy to create artifacts that distract the first responders from their main task *or that distract the drive to a*

<sup>1</sup> <https://www.svt.se/nyheter/lokalt/vast/polis-mordad-i-biskopsgarden-i-goteborg-detta-har-hant>  
[retrieved 2022-01-25]

situation after an alarm call (Sanquist et al., 2016). Sanquist et al. (2016) argue that *research should be carried out “to evaluate the impact of high workload in emergencies upon attentional focus of responders”* to find out what they pay attention to, and how additional data streams affects their focus. Information technology and information distribution when stressed is a challenge, for example, studies on the mobile vehicle-mounted terminals used by the police, shows that it really affects the police cognitive performance (Zahabi & Kaber, 2018). Technology for situational awareness has more success when the focus is to create a more organizational situational awareness with e.g., aim to coordinate and manage a large crisis (Ashish et al., 2008). Drones and body worn cameras are technologies that have been used to help police headquarters to understand what a police unit faces during various interventions. Such technology supports others’ situational awareness and not the police intervening (Milić & Milidragović, 2021). Massive surveillance with cameras could also help first responder organizations to detect anomalies and quickly become informed and understand what is going on (Trivedi, Gandhi, & Huang, 2005). Situational awareness on organizational level to detect threats from terrorists also uses technologies to migrate and collect many different situational awareness (Krasmann & Hentschel, 2019).

## RESEARCH METHOD

This paper is the first presentation of a longer research ambition where the Swedish police General Tactical Explanation Model is empirically described, evaluated and tested. This first study focused on understanding the level of competence and how the police officers’ current understanding of the General Tactical Explanation Model can be understood. This study was carried out with support from the Swedish National Police.

This research has been carried out by two researchers. Both researchers have a background as sworn police officers, and both have long experience of tactical interventions and tactical work in high-risk environments. They have also served as instructors in weapons, tactics, and self-defense. Together, both researchers have over 30 years of police experience.

The empirical description of the General Tactical Explanation Model have been done with a mixed method approach (Johnson & Onwuegbuzie, 2004). We have both used the limited text written about the General Tactical Explanation Model which is based on the training material POLKON, which is the Swedish police conflict management system (Polishögskolan, 2013), the National Basic Tactics (Polishögskolan, 2005), and the book “Tactical Edge” (Remsberg, 1986). Beside the literature interviews with four police officers that in various ways have been involved in developing POLKON the Swedish police conflict management system. The police officers interviewed comes from three different police regions in Sweden.

The part where we study how General Tactical Explanation Model is applied is based upon a qualitative approach (Creswell, 2013). The main data collection used has been interviews with 21 police officers from one of the seven police regions in Sweden. The police officer responsible for coordinating tactical educational efforts in the Police Region North in Sweden provided a list of 30 police officers. All officers were individually invited to the study by email and encouraged to book a time for an interview. Twenty-one officers responded directly, and after the interviews were finished, additional interviews were not found relevant for this part of the research. The interviews were carried out in spring and early summer 2021. The 21 respondents had between 1 and up to 30 years of operational police work. Due to Covid-19, all the interviews were carried out using Zoom as a platform and both researchers were present during all 21 interviews. The interviews were recorded and afterwards transcribed. The transcribed interviews were later analyzed using Nvivo 12 as help to organize the findings. In this paper, the General Tactical Explanation Model served as basis for the organization of the findings. The interviews were between 60 and 90 minutes long and guided by a questionnaire template. After some more general questions about the respondent’s background, police experience, and educational background we started the interview with a short video (25 sec). The video was a very short car chase where the respondents saw a police car following a covered van into an industrial property by crashing through a gate. The short video ended with the van standing still, unable to go further. The end scene is seen in Figure 1. After the video ended, the respondents were asked to describe how they interpreted the situation, how they should act, and why. This was the intro to the rest of the interview where the focus was on tactical interventions, decisions, action, and

eventual lack of action.



**Figure 1.** End scene of the video used in the interviews

## RESULTS

In this section we first present the summary of the General Tactical Explanation Model. This is followed by the findings from how the police officers solved the tactical intervention described above – the General Tactical Explanation Model served to structure the results.

### General Tactical Explanation Model

In the following section, we describe our interpretation and a summary description of The General Tactical Explanation Model which consists of three parts:

- 1) Tactical risk and threat assessment
- 2) Human limitations
- 3) Thought processes

The goal of the three parts is for the police in intervention situations to get control of the situation and be able to solve the situation in a legally correct way and as safely as possible for all involved parties. Control in the situation is defined as: “time and own ability to an adequate response”.

#### *Tactical risk and threat assessment*

To gain control and anticipate possible attacks is a requirement to carry out a realistic tactical risk and threat assessment and to know where an attack may come from. This assessment is based on the definitions of risk area, problem area, and threat assessment.

- Risk area – where the attack may come from.
- Problem area – always contains one or more risk areas.
- Threat assessment – in the environment, the police officer should anticipate what can be or become dangerous, what type of attack the officer may be exposed to. It is important to make a realistic threat assessment based on knowledge of the

environment, past events, the person/persons encountered, and other factors, such as the reason for the intervention.

Based on these definitions, the police officer should be able to know who and where the risks are and focus on these.

#### *Human limitations*

The “human limitations” are about perception, definition, and reaction. In the event of an attack, it takes time to perceive the attack, to react, to define what type or if it is an attack at all, and then to act upon it. When attacked, humans have a limited ability to *perceive* their surroundings. This is especially true if you feel that you are in a life-threatening situation. The limited perception can make the attacked person only look at the knife, if the person is threatened with a knife, but the attention can also be on something else, such as the face of the attacker. Perception is also limited if the attention is on something else without a threat. Knowledge of these human limitations is essential when assessing whether you have control of the situation. In addition, to perceive a situation, a police officer must also understand the attack, that is, *define* whether it is an attack and what type of attack. The third human limitation is reaction time. Simple reaction time is a measure of how quickly an individual can react to a certain stimulus – for a human is about 0.2 seconds. Based on the police officers’ skills and abilities they must assess whether they can handle an attack from the identified risk areas utilizing the tactical risk and threat assessment. The “human limitations” are affected by various factors such as stress, sound, light, experience, physical status, skills, and ability. This means that the specified times can vary from one situation to another and from one individual to another. Regardless of situations and individual differences, the police officer needs to be aware of the time it takes to perceive, define, and react before he or she acts with an adequate response.

#### *Thought processes*

The thought process is the third part of the General Tactical Explanation Model. Through tactical risk and threat assessment, the risks are identified. Based on the knowledge of human limitations it is possible to know whether the officer has control of the situation, i.e., is it enough time to perceive, define and react to a possible attack. If the answer is "No!", control can be established through the thought process. This can be done by starting processes on what the counterpart needs to do to attack, and by removing processes that the police officer needs to do to have time to adequately respond. The counterpart must, in order to attack, prepare and localize the police. To act, the police must also prepare and localize the counterpart. In addition, to be an adequate response, it is necessary to define the attack. The police should make it difficult for the counterpart to prepare and localize the officer. For example, giving the counterparts orders to put the hands in the air or lay down on the ground and move to a safer place behind cover. Simultaneously the police officer should facilitate for him or herself by preparing appropriately and by locating the counterpart. For example, draw their service weapon if it is appropriate and enlighten the counterpart if it is dark.

<b>Counterpart</b>	<b>Police officer</b>
1. Localize	1. Localize
2. Prepare	2. Prepare
3. Attack	3. Define
-	4. Act with an adequate response

#### **How the police solved the car stop**

In this section, we report the results from the individual interviews. The results are presented with thematic headings. The data presented is about how the police officers acted following the General Tactical Explanation Model, which is presented above.

All 21 police officers interviewed in this study seem to be aware of how to act tactically in a situation like a car pursuit and vehicle stop that they were shown in the video during the

interviews. However, they do not use the terms from the General Tactical Explanation Model in POLKON's training material when describing their actions. The respondents described what they should do, why they should do what they did. Depending on how they interpreted the situation, their actions varied, but they all had reasons for their choice of actions. To better understand the interviewed police officers' narratives, we have used the themes in the General Tactical Explanation Model as thematic headings.

#### *Tactical risk and threat assessment*

The first part of the General Tactical Explanation Model is the tactical risk and threat assessment, which includes being aware of where an attack could come from. Thus, it is important to focus on the risk areas. In their accounts of the events surrounding the first seconds after the stop, the officers said they should focus on the side of the van where they were positioned, i.e., the driver of the police car focused on the left part of the van, and the passenger of the police car focused on the right part of the van. Some of the respondents discussed the difficulties of knowing what the threat is:

*If I know that he is going to drive this car full of explosives and the goal for him is that he is going to drive it into a school and it is going to be blown up, then it will be, then you have some other problems. Or is it a lurcher (Kalle Kula) that has 5 grams of hashish in the door side? So, it is difficult.*

In general, the respondents asked for more information and some of them said that in a real situation they would have had more implicit information to use when interpreting the situation.

Another problem that was mentioned in the interviews was that the van was covered and thus it is impossible to see into the vehicle. This means that the police cannot know how many people are in the car, and interviewees said they cannot know the risks when the vehicle stops.

#### *Human limitations (concept of control)*

The second part of the General Tactical Explanation Model is human limitations, which include perception time, definition time, and reaction time. Some of the officers argued explicitly that it is important to be aware of the human limitations: "you have to define the threat before you can decide what to do and react" or related to control: "it is time to perceive, define and act". This part of the General Tactical Explanation Model is expressed related to time by some interviewees, in addition to which the officers want to have time to make the right decisions and to gain control. But it is also related to the lack of information in such situations as the vehicle stop. One interviewee said:

*You want to have time to be able to define and be able to see what is happening. It will be them to us<sup>2</sup>, that you create time and opportunity. You want as high a level of preparedness as possible. I had probably drawn my service weapon in this situation. To see what comes out of this car. But that is exactly it, to have time and to have time to define what is happening in there. That is often what we neglect the most, I think. That, when we run to the vehicle then we will probably meet someone who wants to escape, most likely but we do not know. And there will be a confrontation that will be difficult to handle depending on... We know nothing. So that, yes...*

Some interviewees talked about if it is a stressful situation, how they act in a confrontative way instead of creating more time, which makes it more dangerous if the driver attack instead of an escape. Another interviewee said:

<sup>2</sup> This is a method when the police command the suspect to step away from the problem area to a safe area where the police have control, instead of going ahead and confronting the suspect close to the vehicle and exposed to the risk areas.

*it will probably be some kind of “thought error” in the form of wanting to start this control that if you sprayed the driver and put him on the ground then you have control. But you may not have thought about what might happen on the way there. It may only be two seconds from getting out of the police car to the perpetrator’s car, but it is these two seconds that count. That is when you go from your car to his car.*

### *Thought processes*

The third part of the General Tactical Explanation Model is the thought process, which includes putting processes on the counterpart while at the same time taking away processes from themselves. A common view amongst interviewees was that they want to see the stopped vehicle so they can localize the risk areas and therefore gain control. As one interviewee put it: “but considerations that I can imagine, there is a very large focus keeping eyes **on** the target?, that you really do not want to lose visual contact with the car.” One interviewee said that an important approach is to use the high beam and light up the stopped vehicle. Some interviewees argued that they would move behind the patrol car, while others would move forward to the stopped vehicle to gain better control. One interviewee said:

*Out of the police car as soon as possible I do not want to get stuck there. There was nothing to indicate any danger, but you do not want to rush forward. Personally, I would like to back up a bit and stand behind the police car as protection and shelter or if there was something near the police car where you can go and just order the people in the car.*

Further, the interviewee argued: “If you stand under a good protection or shelter then they must find you to attack you”. Another interviewee also argued getting out of the patrol car and creating a longer distance to the stopped vehicle. A few of the interviewees used the defined terms of where the attack can come from, that is the “risk area”. In addition, the interviewees discussed how to be prepared to act in an adequate manner against what they perceive and define. For example, one interviewee said: “it is not entirely unreasonable to draw the service weapon at that time, depending on other circumstances”. There were some suggestions that the best action was to take out the distance to gain more time in relation to the people in the stopped car and then try to command them to come to the police behind the car outside of the problem area. One interviewee described how the police ordered the counterpart: “With their backs facing us so we have control”, and then arrest them behind the patrol car and put handcuffs on to gain control of them one by one.

All interviewees said the patrol car was too close to the stopped vehicle. A small number of those interviewed suggested that they would rush forward to the stopped vehicle before the driver has time to get out of the car and run. In their accounts of the events surrounding car chases those informants argued that most of the time the driver tries to get out of the car and run so the best way to gain control is to be a step ahead of that action and be at the driver’s door as soon as possible.

### *Flexible*

Some of the interviewees were more consciously aware of being flexible in their actions and that the situation can change very fast. These quotes visualize how the three themes: tactical risk and threat assessment; human limitations; the thought process work together in an ongoing circular process:

*I’m not controlling the situation; I do not have the time and ability to act in a situation where I stand by the police car at this distance. I’m too close, so I have to do something to improve my own possibility to gain control. Based on this clip, I would without knowing what the background is, if I make the assessment that no one will point a Kalashnikov at me, I would use the flexibility and success factors in particular order, i.e., speed of movement and surprise to take control*

*of them and take a verbal control and eventually a physical control on those inside the van. With weapons or without weapons? Yes, hard to say without knowing more than having seen this clip.*

*Yes, and this is the difficult thing about being a police officer, I have to make these decisions in a split-second and go out into the terrain, if I consider it as possible to be able to see and assess and order, it is not to be passive, that is to be very active. I've just created myself time. But it will be your assessment there in the situation, what is it that gives the best effect, what is it that creates the most opportunities for me? Is it to take the distance or is it to immediately move forward? It's always the balance I have to work with. And it has to go very fast and if it has to go very fast, I have to have an understanding of why I make those decisions as well. So, I would not say that "I always run forward" or "I always hurry to distance myself". Sometimes run forward is good other times distance is. But what we do know is that we need time to sort things out, so in most cases it's better (with distance).*

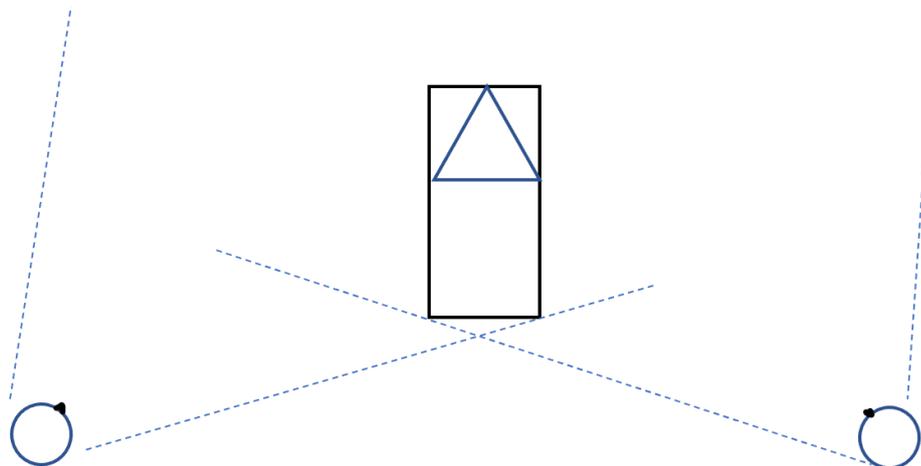
There were also interviewees that argued for being offensive and rushing forward to the driver's door without being aware of the human limitations in such a conscious way as expressed in the above quotes.

#### **PRELIMINARY CONCLUSIONS – TALK ABOUT DESIGN**

How can The General Tactical Explanation Model be related to the three levels of situational awareness by Endsley et al. (2003, p. 14)?

Level 1, *perception of the elements in the environment*, is when the police officers above are carrying out the tactical risk and threat assessment. In this study, the factors affecting the perception most were the time available and the distance to the stopped vehicle. Directly when the vehicle stopped, several obvious risk areas were detected by the interviewed police officers. The initial challenge is to grasp the situation. In the study, the interviewed police officers could reflect on their thoughts, but they also reflected that the real action would have been different whether they were the driver or the other officer. The driver naturally has a focus on the elements in the environment affecting the driving, and the other police focuses on communicating with the dispatch central, reporting what they are doing. Limited focus is on the risk area, i.e., the car, when a car chase is short, as there are other necessary tasks to carry out.

Level 2, *comprehension of the current situation*, according to the officers, this starts as soon as the car chase begins. In this study, the real comprehension starts when the car has stopped, with the police car close behind. The police officers try to gain control in the situation in two main ways, either by taking physical control of the driver or by creating a distance to the stopped van. Approximately half of the interviewed police officers explained that their action after the van stopped was to directly run towards the driver and make sure he/she could not run away or make any threat towards the police patrol. The majority motivated their action by not wanting the suspect to run out in what the police officers interpreted to be a forest. The other half of the interviewed police officers explained their action as action to create distance from the car. These officers also thought that the police vehicle stopped too close to the van, and therefore they wanted to increase the distance from the car. Many of them explained that they and their partner stepped out of the police car, moved out from the van, and created a V, where they could act safely, see Figure 2.



**Figure 2.** How the police officers explained how to create control through distance.

Level 3 – *projection of future status*. As explained above, the thought process is part of the work to create time and therefore also better potential to increase situational awareness by opening up the initial “narrow” view of the stopped van. By creating a distance to the van as seen in Figure 2, the officers had the potential to act upon new situations in a safe and secure way. They could also see each other and communicate through radio. However, on the contrary, the officers that acted directly on the driver of the van were aware that they took a risk, and they also left their partner to control all the other risk areas.

#### DISCUSSIONS OF NEED FOR DESIGN SUPPORT AND FUTURE RESEARCH EFFORTS

Situational awareness for first responders and in this study the police officers during tactical intervention is challenging. Situations arise quickly and time to understand what is going on, for example, competes with the time it takes to report what the unit is doing to the dispatch center. In either self-initiated interventions or in interventions directed by the dispatch center, a normal procedure is that one police officer drives the car. His/her situational awareness is fully focused on the drive and ensuring that the patrol gets to the location safely and quickly. This phase could be called a *pre-intervention phase* in which the police could be supported by technology that could detect anomalies in traffic, route the drive, and support the communication with the dispatch center. The technology need could be summarized as a way to manage a high level of information. During the continuation of this research, we are aiming to carry out new data collection to better understand the process of situational awareness which includes this *pre-intervention phase*. Situational awareness probably starts a long time before a police unit arrives at a scene.

In the *intervention phase* where the police acts and intervenes, we have seen examples above of problems with controlling risk areas, such as when the police gained control physically of the driver the other police was left to manage many risk areas alone. But another situation where for example a police unit talks with a suspect the risk area is 360 degrees, and it is challenging to control the suspect and the surrounding areas at the same time. In the coming research, we are also going to conduct experiments on how police officers react to threats and how this also affects their situational awareness.

There is a high level of complexity in the situational awareness process for police officers and further field studies, interviews, and experiments are needed to be able to draw more permanent design implications. However, we aim for the rich description of fieldwork in this paper to encourage more practical-oriented groups to start an innovation process.

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