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Ice, snow and polar bears: Decision making among professional guides in the Arctic

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Summary

The purpose of this thesis is to study how Arctic Nature Guides make decisions in uncertain and ambiguous situations. In this context, guides face factors related to the guests' expectancies to the guided tour, external risks, and aspects that influence their decisions. The terms crisis and crisis management are utilised to understand the contextual components throughout the decision-making process. This study relies on data gathered through a qualitative method. The data is based on 9 interviews from guides with work experience as guides at Svalbard and education through the Arctic Nature Guide study at Svalbard. The findings show that when conducting decisions in crisis scenarios, the guides seek to avoid the fallacies caused by cognitive heuristics, yet they use these cognitive cues to stimulate recognition when facing risks. Through intuition guides produce their perception of the situation at hand. Experience and competence are important variables in recognising circumstances that are similar or have similar patterns as previous encounters. The guide uses a mix of their intuitive and analytical decision-making, where the analytical perspective is mostly used in the planning phase and when projecting the future status, while the intuitive in the moment where a decision is made. This connection constructs a reliable approach to decisions when confronting risks. Preparation is a key influence for a rapid solution to the problem, although the intuition solves it ultimately.

Key words: decision-making, recognition-primed decision-making, arctic nature guide, Svalbard, Arctic, situational awareness

1 Introduction

“Nå får De nok skynde dem, hvis det ikke skal blir for sent” or “Now you may hurry, if it is not to be too late” - Words of Hjalmar Johansen, to Fridtjof Nansen, as he grips the throat of polar bear situated on top of him (Østvedt & Egedius, 1967).



Figure 1 - Johansen and Nansen meeting a polar bear (Østvedt & Egedius 1967)

Even though exploration in modern times versus the time where Nansen roamed the high Arctic are different in the way that few had been in these areas before, and even fewer such far north, exploration of the Arctic is still existing today. However, the aim is not to discover new land or beasts that have never been introduced.

Today, self-realisation at the hand of guided tours with experienced experts, often referred to as guides, is a growing venture. Since the Norwegian parliament appointed tourism as one of three concentrated business development strategies in the beginning of the 1990s at Svalbard, the number of guestdays has increased by fivefold in 2014. From 23,854 in 1993 to 118,614 in 2014 (Sysselmannen, 2014). In 2019 this numbers have even advanced further to 162,949 (Visit Svalbard, 2019). With growing numbers, the tourists visit Longyearbyen, the front door to Arctic nature. In 2018 the number of guests visiting was approximately 135 500 people from both aircraft and cruises (Øian & Kaltenborn, 2020). The tourists are the ground pillar of economics in Svalbard, and in even a year with covid-19, 2020 tourism and cultural affairs stood for 540 million Norwegian kroners, which was 4,5% positive change from 2010 (SSB, 2022). The area of Svalbard is covering 15,7% of the areal of the Norwegian kingdom and is consisting of 60,299 km². With 2,940 people living at different settlements (SSB, 2022). This

makes the island immense and quite sparsely populated, and highly attractive for people that want to feel the untouched nature. With harsh weather conditions, remoteness, low temperatures, lurking dangers, and dangerous wildlife (Albrechtsen & Indreiten, 2021), tourists inquire the experts to explore the Arctic areas.

The nature guide works professionally within nature, and the basic competence of such guides is proficiency and responsible leadership related to safe travel and exploring nature with groups of people (Røkenes & Andersen, 2020, p. 362). In 2018 there were 130 tour operators working with adventures guests, seeking the untouched and wild nature in Svalbard (Øian & Kaltenborn, 2020). With this in mind, tourists visit Svalbard in search of thrill and adventure, and in the midst of their experience you find risk. The pursuit of these risks is not only based on accepting risk as what Renn (2004, p. 407) describe as “pleasurable benefits” (to spot a polar bear or skiing in terrible weather), the prosperity lies within the risk itself: to conduct these risky activities. Considerable amounts of nature-based tourism are created on the fact that experiences are built on risk and are broadly accepted by the paying tourists (Røkenes & Andersen, 2020).

Nature is unpredictable and causes complications for the companies that want to have rule-based decision-making in midst of the complicated relation between humans and nature (Røkenes & Andersen, 2020). Furthermore, Røkenes and Andersen (2020) display that nature-based tourism is too complicated and dynamic in the relation of all diverse situations a guide will face. This necessitates that the guide can take decisions out of their own competence and deviate from routine. Empowerment is crucial for knowledge of how to solve risk and uncertain situations, as well as the ability to implement decisions (Røkenes & Andersen, 2020; Utdannings- og forskningsdepartementet, 2004). The value creation is not only based on the positive experiences that the client receives, but also preventing or stopping the development of negative incidents (Røkenes, Schumann, & Rose, 2015). In other words, the guide must make decisions to avoid situations where there is a possibility of harmful events. The guide must develop an eye for detail to be in procession of a “non-stop mindset of awareness” (Løvoll & Einang, 2022, p. 105), and continuously assess the surroundings. Such details could be the “snow cover, terrain, weather, ground, soil, water, biology, and so on carry important and sometimes life-threatening information” (Løvoll & Einang, 2022, p. 105), and then decide about its importance.

One of these risks could be an encounter with a polar bear, such as the two polar explorers once came across, or a rapid change in the weather, rushing from warmth and sun into low temperatures and no perception. With increasing groups of people adventuring and exploring these Arctic regions, the arctic nature guide has an urgent need to be prepared for the unsympathetic and ever-changing characteristics of Arctic nature. Moreover, the Arctic Nature Guide must manage situations of uncertainty and decide for a result under diverse pressure from the guests, the risks, and the period in which these situations manifest themselves.

1.1 Background and context

In consideration of the numerous factors that could affect decision-making in the Arctic, guides have a critical responsibility to maintain safety for themselves and guided groups. The role of the guide is to compose learning and closer relationship in the participants experiences (Andersen & Rolland, 2018). At the same time, the guide must continuously assess the surrounding elements and rapid situation changes that occur (Røkenes & Andersen, 2016). Therefore, the nature guide is one of few operators that has responsibility of groups outside in the Arctic environment. Since the work of the guide is to preserve the groups safety, the guide must have a set of skills to execute decisions. Combined with experience and professional education, guides must reach decisions in critical situations, with lack of time, when confronting Arctic risks. For this reason, there is meaningful to explore decision-making of guides in crisis situations situated in the Arctic. This is a topic with limited former research in the direction of guides, even though there is research on activity in Arctic environment, and influential factors in the direction of other Arctic operators. Through exploration of this subject, I hope to contribute with extended knowledge around skills and knowledge needed in high-risk context.

Problem definition and research questions

How does arctic nature guides make decisions in crisis situations?

- What is affecting the decision-making process of the arctic nature guide in these situations?
- How does the arctic nature guide reach these decisions?

1.2 Previous research

Research in to the Arctic has revealed that tacit knowledge is important (Indreiten, Albrechtsen, & Cohen, 2018). Operations in the Arctic are challenging and it is crucial to cope with various situations during field work in the high arctic (Indreiten et al., 2018). These challenges could be lack of infrastructure, harsh and variable weather, darkness and rapidly changing natural hazards (Indreiten et al., 2018). The authors of the article demonstrate that operators need to improvise and deviate from the original plan because of changes in the natural environment, affecting the frequency and magnitude of hazards, in the last five years. In this context, to deviate from the plan is to perform the activity safely. The main purpose of the article is to describe how experience feedback and tacit knowledge is an important feature to maintain the safety management and safe operations in the field.

With this in mind, Røkenes and Mathisen (2017) address the roles of adventure guides in perception of risk and safety. There are several aspects that an adventure guide must have in mind. Risk is normally linked with dangerous situations. However, the tourists have an ambition for these risks that relates to the values connected with thrill, enjoyment, and excitement (Røkenes & Mathisen, 2017). The guide must handle guests with a different perception of both risk and safety. Not to mention that the guide is necessitated to manage tourists' perception of risk and safety at individual and at group level (Arnould, Price, & Tierney, 1998; Mackenzie & Kerr, 2013; Røkenes & Mathisen, 2017). Røkenes and Mathisen (2017) indicate that the guides knowledge and skills of real risk is a crucial part of preparing a safe activity. However, the tourists do not have the same background to generate the real risk of a situation. Additionally, the authors declare that it is important for guides to further develop beyond practical skills connected to real risk assessments. In conclusion the authors indicate that the guides need to predict, understand, and deal with people's understanding of risk and safety.

To deal with both humans and nature the guide must assess the situation and deal with incoming events. A report on human performance and Safety in the Arctic corresponds with Indreiten et al. (2018) on the experience of: Fluctuating weather, light and darkness, challenging terrain, wildlife, isolation, and remoteness (Wærø, Rosness, & Kilskar, 2018). "The emphasis on knowledge and understanding of the specific environmental challenges and risks in Arctic are necessary to avoid risky situations and cope with potential human reactions" (Wærø et al., 2018, p. 8). Furthermore, Wærø et al. (2018) provide several

characteristics and behaviors that are associated with physiological and psychological mechanisms in a human being: sensory apparatus, perception, cognitive attention, group processes and decision making (Wærø et al., 2018). Additionally, Wærø et al. (2018) relates these findings in the relation of human resilience.

An additional point that Wærø et al. (2018) compose, is the factors of decision-making in the sharp-end and how decisions in crisis situations propagate in difference to normal decision-making in the Arctic.

Previous research on police officers' decision-making in uncertain situations (Henriksen & Kruke, 2020) show that they draw upon patterns of recognition from previous experience in using firearms. This recognition results in a combination of analytical and intuitive decision-making. These decisions are established upon cues to which the officers respond. The contextual factors of this research are stressful conditions and the commonly short distances when the shots are fired (Henriksen & Kruke, 2020, p. 115). Furthermore, police officers hold their fire until the threatening situation has emerged, and find themselves in potentially imminent danger (Henriksen & Kruke, 2020, p. 99)

How do guides make decisions in high-risk situations? What roles do internal and external factors imply in decision-making? Is decision-making differing from other high-risk occupations? This is what the thesis sets out to explore.

1.3 Structure of thesis

In the first chapter of the thesis, I have described the background, context, and previous research associated with the research questions. The second chapter consists of theoretical framework, which establishes the fundamentals of the discussion. The following chapter includes methodology with explanation of choices related to interview and application of these in the thesis. In the fourth chapter the empirical data, which is gathered from the data collection, is presented. The empirical data is discussed against the theoretical context and previous research in chapter five. In the last chapter the conclusion is presented based on the research questions and with suggestions for further research.

2 Theoretical framework

The theoretical framework begins with conceptualising the risks that the guide face and why it necessitates decision-making. Moreover, I will present the crisis and crisis management as a contextual part of reacting to these risks in uncertain situations. Then followed by naturalistic decision-making with the two alternatives of analytical and intuitive decision-making, situational awareness and sensemaking, and recognition-primed decision-making.

2.1 Risk

There is a necessity to define risk. Since the Arctic Nature Guide both fundamentally make decisions when faced with considerable risk, or on the edge of a crisis. The guide must be proficient in perceiving what could happened and at the same time deal with a situation when it occurs. Risk is something that occurs, either as natural causes or as prepared and unaware human actions (Engen et al., 2016). Risk could be seen as “uncertainty concerning what would be the consequence or outcome of a given activity” (Aven, Boyesen, Njå, Olsen, & Sandve, 2004, p. 37). Pursiainen (2018, p. 11) describes risk as something that “would be based on our knowledge of historical data in the case of recurring events, coupled with a documented loss of history that displays a certain regularity in the way that the risk scenarios play out”. Nevertheless, all concept of risk has in common that they establish a connection between possible and selected actions (Engen et al., 2016; Renn, 2008). However, we can gather as much information about an activity as possible, yet the risk assessment will always be contaminated by heaps of uncertainty. Accordingly, we need to prepare for the residual risk, and for the unexpected events, the black swans (Aven & Renn, 2010; Kruke, 2015; Taleb, 2007).

In the field of psychology there is a long tradition to describe uncertainty as a “objective” probability (Aven et al., 2004), the psychologists want to measure how people respond on different risk experiences (Engen et al., 2016). Risk perception is deeply interconnected with risk, it deals with how most people understand, experience and deals with risks and danger (Aven et al., 2004; Renn, 2004). However, there is many factors that influence how humans select and evaluate information (Aven & Renn, 2010): information selection, cognitive heuristics, psychometric factors, semantic images and risk compensation.

Information selection depend on the individual's ability to analyse what criteria we emphasise in some phenomena at the expense of others. Also defined as biases (Renn, 2008).

Furthermore, there is especially two factors that influence this process: motivation and skills (Engen et al., 2016). When this information is received, the individual process this through cognitive heuristics, or more commonly titled: intuition. Cognitive heuristics is mental filters which selects and establish our sensory impressions. Filters like this is important for how an individual perceive the probability of a situation will happen or not, and how the individual act accordingly (Engen et al., 2016; Renn, 2008). Furthermore, these cognitive heuristics could result in erroneous decisions because of wrongfully comprehension of cues. Similarly, how individuals act in avalanche terrain: there is traps that may lead to decision errors depending on group size and training levels (McCammon, 2002). The research on psychometric factors displays how humans relate and act differently to the “objective” probability. This is related to the evolutionary flight, fight, play dead or try and fail – with an origin towards these evolutionary mechanisms, the field of psychometric research have further developed that subjective standard is as important as objective and technical standards (Engen et al., 2016). Additionally, the semantic images demonstrate that perception is part of a comprehensive awareness of how individuals experience the context they are part of. One alternative of this, derive from how many people demonstrate excellent abilities to conduct probability calculation – stimulated by experience and knowledge – which helps when doing decisions (Engen et al., 2016; Renn, 2008). Subsequent, the theory of risk compensation is established on background of human behaviour when the surroundings are harmless, and the risk is reduced. Furthermore, it offers insight in relation to how individuals react on a perceived reduction of risk with a lesser cautious behaviour (Engen et al., 2016). These points are also something Renn (2008) pay attention towards when discussing that majority of research on risk perception is related towards “divergent views about tolerability of remaining uncertainty, short-term and long-term impacts, the trustworthiness of risk-regulating or risk-managing agencies, and the experience of inequity or injustice with regard to the distribution of benefits and risk” (Renn, 2008, p. 3; Renn & Rohrman, 2000).

Researchers have attempted to interpret how people take decisions under uncertainty (Aven et al., 2004). Additionally, a perceived essential precondition is that safety and risk is something that can be influenced and “controlled”. This means that not everybody has the same control or influential possibility. However, it is not possible for the guide to control the weather, yet the guide must adhere to it. Nevertheless, in our small and greater decisions and priorities,

both as individuals and groups, we decide the level of exposure towards the risk. Likewise, the greater comprehension of how our choices affect the risk, the more “correct” choices we make (Aven et al., 2004).

2.2 Crisis and crisis management

In this thesis I draw from decision-making theories from the two larger fields of risk research and crisis management, where many different theoretical approaches and concepts can be of importance. To understand the context of taking decisions in uncertain situations, there is a necessity to explain and conceptualise the meaning of crisis management. The immediate thought is that crisis management and crisis is related to professional organisations and the public services. However, it has relevancy to individual level with its larger and smaller crisis or accidents, and the handling of these (Engen et al., 2016). Essentially, a crisis is an event of various extent that pose a threat to goals or values. What is common for all crisis is that it necessitates active response and decisions, this is because one act to reduce the losses. However, there could be numerous uncertainties connected to the situation at hand and it could be rather difficult to have outline of the situation (Hermann, 1963; Kruke, 2015; Pursiainen, 2018). When the term crisis is used, it covers different events and different damage potential. Here the response is highly dependent on the size of the event (Kruke, 2015). Crisis is understood as an acute event, an event that is an exception from our normal everyday life (Kruke, 2015). Then crisis management can be seen as management of expectations (Roux-Dufort, 2007). To further narrow the definition of crisis I will present different definitions.

There have been presented different definitions of crisis and disasters, and Quarantelli and colleagues have extensively researched it (Kruke, 2015; Perry & Quarantelli, 2005; Quarantelli, 1995). As well, Fritz’s definition of disaster is:

“An event, concentrated in time and space, in which a society, or a relatively self-sufficient subdivision of a society, undergoes severe danger and incurs such losses to its members and physical appurtenances that the social structure is disrupted and the fulfilment of all or some of the essential functions of the society is prevented” (Fritz, 1961, p. 655).

However, Rosenthal, Charles , and t'Hart (1989, p. 10) presents a definition with decision-making as the core element:

“a crisis is a serious threat to the basic structures or the fundamental values and norms of a social system, which – under time pressure and highly uncertain circumstances – necessitates making critical decisions.”

Where Fritz (1961) focus on the danger, losses, disruption and functions of society, Rosenthal et al. (1989) target the decision-making in responding to crisis. This thesis will use Rosenthal et. al's definition on crisis as the foundation towards crisis management.

Crises is often defined as unexpected and incomprehensible, and we tend to connect it to the acute crisis phase (Engen et al., 2016). The acute phase could be seen in connection with preceding and following phases of a crisis (Engen et al., 2016; Kruke, 2015). Furthermore, to get a holistic view of crisis, it's important to recognise crisis as a dynamic event that commence long before the situation, and which could last long after its terminated (Engen et al., 2016). With this in mind, there is definite coherence with prevention in a pre-crisis phase, and the approach in the acute phase as the crisis is developing (Engen et al., 2016; Kruke, 2015). Additionally, this will determine the learning and outcome of the aftermath in post-crisis (Engen et al., 2016). The ambition of this is that when learning from the last crisis, there would potentially enhance the new post-crisis phase and establish a higher level of preparedness and prevention (Kruke, 2015).

Crisis management could be defined as critical decision-making under high degree of uncertainty (Kruke, 2015). Furthermore, crisis management in the acute phase is then the process of combining implementations of planned and trained structures, and adopting to the crisis at hand (Kruke, 2015). Besides, the main goal of crisis management is to facilitate recognition and familiarity, through preparedness, when faced by uncertainty. However, not all crises are expected and then require a deviation from planned response strategies. Deviations could be seen as a necessary improvisation, like an intuitive adaptation, to handle the crisis (Engen et al., 2016).

Additionally, a variation of recognisability could be experienced in the occurrence of the crisis, of course this is varying from the nature and characteristics of it. Decision makers then use their experiences to identify the patterns of a crisis and then conduct an adequate and adaptive response (Kruke, 2015). This could be seen in light of situational awareness where

the operators understanding as whole, form the basis of decision making (Endsley, 1995) and later on decide the proper reaction.

2.3 Naturalistic decision making

Psychological research related to decision-making skills in higher-risk work environment is focusing on the decisions made at an operational level, rather than the tactical or strategic level, that is real-time decisions made by the front-line staff (Flin, O'Connor, & Crichton, 2008). However, there exist two different strategies associated with decision-making: analytical strategies and intuitive strategies (Eid & Johnsen, 2018). Where the analytical process involves a process of considerable degree of assessment, calculating and thinking, the intuitive process manifest decisions who has to be made hastily, under time pressure, with less degree of assessment, calculating and thinking (Eid & Johnsen, 2018). Furthermore, there are studies displaying that operative teams from fire departments, pilots and military personnel are not pursuing the analytical model (Brun & Kobbeltvedt, 2005). These operative teams consist of experienced practitioners that make these decisions in the real-world setting, and this area of study is called naturalistic decision-making (NDM) (Flin et al., 2008). The background of NDM is to describe how these experienced practitioners make decisions under conditions of high uncertainty, inadequate information, shifting goals, high time pressure and risk, usually working within teams and subject to organizational constraints (Flin et al., 2008; Hoffman, 2006; Lipshitz, Klein, Orasanu, & Salas, 2001; Montgomery, Lipshitz, & Brehmer, 2005; Salas & Klein, 2001).

However, the decision-makers' challenge is not choosing between alternative options but making sense of the events and conditions (G. Klein, 2015), that is why they rely on processes as situational awareness and sensemaking.

2.3.1 Situational awareness and sensemaking

Information is key for decision-makers and through the creation of situational awareness (SA) the decision-maker creates a foundation for decisions, and high SA increases the possibility for favorable decisions (Eid & Johnsen, 2018). Former research within the operative psychology displays that there is possible to train SA through simulators (Saus et al., 2006).

Furthermore, through a navigation simulator Saus, Johnsen, Eid , and Thayer (2012) establish that persons with favorable stress tolerance (resilient personality type) demonstrated best SA and achievements, and that persons that generate the favorable SA, have the greatest effect of learning (Saus, Johnsen, & Eid, 2010). The possibility to generate SA is not only important for operative decision-making, but as well as in training and exercise (Eid & Johnsen, 2018).

According to Endsley (1995) the basis of SA is the persons perception of the relevant elements in the environment. SA gives the guide an ability to generate suiting behaviour as a response toward a dynamic situation (Smith & Hancock, 1995). Based on the model, decision-making and performance of action is a separate stage directly influenced by the SA. Further, it displays that several factors influence an operator's ability to acquire SA. This is a function of an individual’s information-processing mechanisms, influenced by abilities, experience and training (Eid & Johnsen, 2018; Endsley, 1995). Additionally, this could be seen in context of the guides comprehension of critical elements in the surroundings, how these are associated, and what they could generate in the future (Eid & Johnsen, 2006).

Furthermore, the operators' preconceptions and objectives could interpret the environment in the process of forming SA. Endsley (1995) further describes those other factors in the task environment such as workload, stress, and complexity may affect the SA.

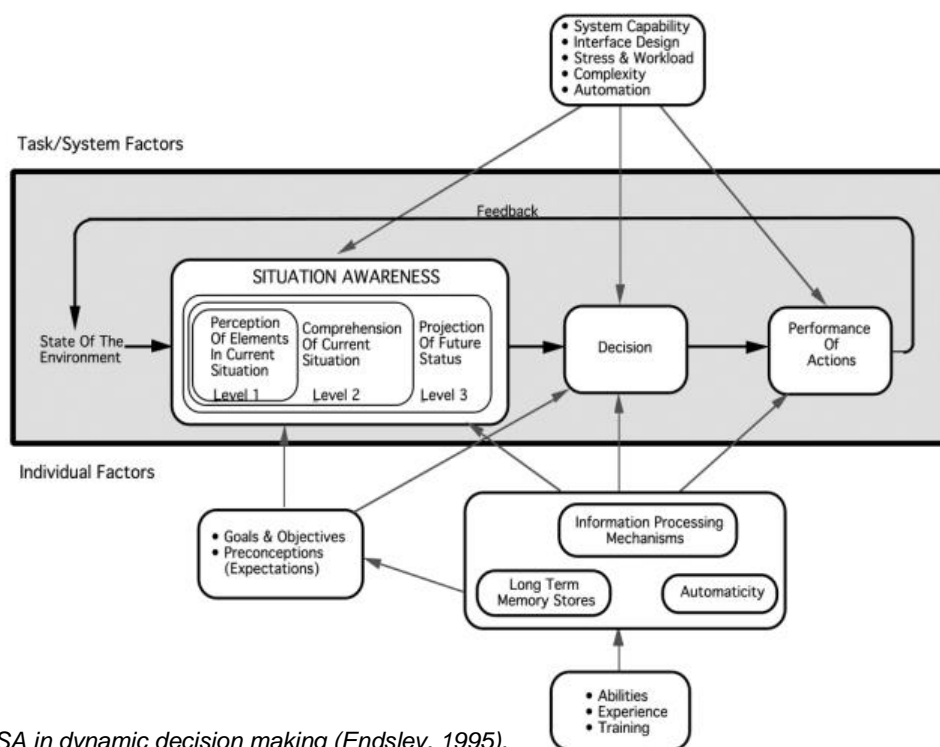


Figure 2 - Model of SA in dynamic decision making (Endsley, 1995).

Endsley (1995) clarify that the term situational awareness must not be seen as a process used to achieve SA, this is associated with the term situational assessment (achieving, acquiring, maintaining SA), and that SA is rather a state of knowledge. However, SA is not seen as all the knowledge an operator comprehends, but only the knowledge directed regarding the dynamic environment. In substance, SA is a person understanding of what is going on (Flin et al., 2008).

Endsley (1995) define situational awareness as three distinct levels, shown in the model. The first level is perception of the elements in the environment. This is executed when perceiving the status, attributes, and dynamics of relevant elements in this nearby environment (Endsley, 1995, p. 36)

The second level is comprehension of the current situation. This is based on disjointed levels from perception. The second level of SA goes beyond of being aware of the elements and includes an understanding of the significance of those elements considering the goals that the guide may have. Based on the knowledge from the first level of SA, the decision-maker forms an interconnected picture of the environment, and then relates an understanding between the significance of objects and events (Endsley, 1995, p. 37)

The third level is projection of the future status. This ability forms the highest level of SA. This is achieved through knowledge of the status and dynamics of the elements and comprehension of the situation at hand. Which is the two earlier levels of SA. This ability provides the knowledge and time to decide on the most favourable course of action (Endsley, 1995, p. 37)

In other words, the three levels are based on: obtaining data from the environment; understanding what this data means, based on knowledge or experience; and finally, being able to make predictions about what will happen (Endsley, 1995; Pursiainen, 2018, p. 52).

Furthermore, Endsley (2015) discuss the importance of the active role that the operator plays in obtaining their SA. “It is critical to note that this is not a passive process of receiving displayed information, but one which the operator may be very actively involved” (Endsley, 2000; 2015, p. 10).

Additionally, projection and comprehension are a significant part of detecting and identifying critical problems (Endsley, 2015). Besides, anticipatory thinking is also specified in Endsley

(1995) model through the level 3 part of SA. Anticipatory thinking is based on how the attention of a person is directed, speed and accuracy of perception, the role of expectations in interpreting perceived information, and the role of violated expectations in selecting new mental models and in modifying these mental models, goals, and plans (Endsley, 2015). This again will generate proactive decision-making. Another point is that contingency planning forms higher levels of SA, as Bolstad, Endsley, Costello, and Howell (2010, p. 22) describes: “contingency planning greatly contributes to high levels of SA projection (the highest level of SA) and the ability to quickly detect and comprehend events. Pilots who do not actively engage in contingency planning are far more likely to be overloaded by events in high workload periods.”

Previous research indicates that high-risk occupations necessitate SA and missing SA could be critical. Problems related to SA are commonly associated as causes of accidents in dynamic task settings such as flying aircraft, piloting ships, operating control rooms, warfare, firefighting, policing, and acute medicine (Flin et al., 2008). One of these problems could be confirmation biases. Here the model of what is going on is wrong for the present situation, but the incoming information is interpreted to match this model, the person is “bending the facts” to fit (Flin et al., 2008).

Another capability of making sense of events and conditions is sensemaking. The term is related to understanding events that have happened (Weick, 1995) and to anticipate future situations, typically under uncertain and ambiguous situations (G. Klein, Wiggins, & Dominguez, 2010). Sensemaking is the process of understanding what is happening around you, to make sense. This process involves distinct functions: problem detection, problem identification, anticipatory thinking, forming explanations, seeing relationships as well as projecting the future (G. Klein, Phillips, Rall, & Peluso, 2007, p. 119). Recognition-primed decision making has features of sensemaking in its reliance on past experience, even though it remains in the genre of decision-making (G. Klein, 1993; Weick, 1993). Previous research on the Mann Gulch fire disaster displays the importance of sensemaking. The firefighters in the Mann Gulch disaster did not understand this before it was too late. The result of this made the firefighters unable to make sense of the situation, and slowly it made less and less sense (Weick, 1993). The stubborn belief that the fire was as they had perceived and understood before embarking, established the decision making on wrong impressions. The decisions faltered because of deficient sensemaking (Weick, 1993).

SA and sensemaking are two similar concepts, however they differ at some points. Endsley (2015) describe both misconceptions and misunderstandings related to SA, and one of her points is that sensemaking could be seen as the process of going from level 1 SA to level 2 SA: *“a process of forming level 2 SA from level 1 data through synthesizing information, using story building and mental models to find some representation that accounts for and explain disparate data”* (Endsley, 2004, p. 324). However, Klein et. al. (2007) claim that there is a difference between the two concepts. Endsley (2015) explain that there are minor differences: (1) SA is often based on a highly automatic process of situation recognition. This automated process uses cognitive schemas formed from previous similar situations. Whereas sensemaking is a conscious deliberate process (p. 18). (2) Sensemaking is generally backward looking, whereas SA is forward looking. However, SA merge backward looking into the level 2 SA requirements and focuses on how these factors influence other aspects of the situation and the influence of these in the future (p. 18). (3) Sensemaking ends with the explanation it derives from, while SA uses this explanation to understand the full situations and then assess the possibility of future events (p. 19).

Even though The Endsley model shows situation awareness as a stage separate from decision making and performance, SA is the main precursor to decision-making (Endsley, 2000). Between SA and the performance, there are as Endsley (2000, p. 4) put it: *“many other factors also come into to play in turning good situation awareness into successful performance”*. It is possible to have a splendid SA, and yet make an incorrect decision. In the same way, it is possible to make satisfying decisions with inadequate SA (luck). This link is important because an experienced decision-maker benefits from the essential link between SA and decision-making (Endsley, 2000).

2.3.2 Recognition-primed decision making

Endsley (2000) illustrate the compelling evidence of direct link between recognition-primed decision-making, and situation recognition/classification and associated action selection. Which is the work of Klein (1989). A separate point that Endsley (2000) make is that decisions are formed by SA and SA is formed by decisions (Adams, Tenney, & Pew, 1995; Endsley, 2000; Smith & Hancock, 1995). Moreover, Weick (1993) relates recognition-based situations and the quality of crisis management to the term *“déjà vu”*. These recognition-

primed situations constitute the fundamental approach for decisions in crisis (Engen et al., 2016).

A key activity in recognition-primed decision-making is to understand that the situation cues presented do not really match well or clearly to existing schema or models and that the operator have to consider alternate possibilities for what is going on or may happen (Endsley, 2015). Alternatively, described as “most of the time people are using the rapid situation recognition pattern matching type process that characterize recognition-primed decision making” (Endsley, 2015; G. Klein, 1993, p. 21).

Klein (1993) explain recognition-primed decision-making as a method of not having to comprehend with painstaking considerations: “this is because the recognitional decision strategies are more appropriate undertime pressure and ambiguity; analytical strategies are more appropriate with abstract data and pressure to justify decisions” (Klein 1993, p. 147). Essentially, people can match the ongoing situation with patterns that they already have learnt. Assuming people find a pattern that match, a person could very effectively make a rapid decision. The skill of using recognition-primed decision-making is to find the first workable option, rather than finding the best possible option (Klein 2008). This involves that guide make satisfactory decisions instead of decisions that maximise or optimise expected efficiency (Simon, 1956), 70% solutions instead of 100% solutions (Eid & Johnsen, 2018).

A combination between intuition and analysis: where the pattern matching is part of the persons intuition and the mental simulation is the conscious, deliberate and analytical part (G. Klein, 2008). This view corresponds with the experience of the two different systems in cognition: fast and unconsciously (system 1) and slow and deliberate (system 2) (Kahneman, 2003). Klein (2008) explain that an intuitive strategy relying on pattern matching would be too risky because sometimes the pattern matching would produce an inaccurate alternative. While on the other hand, the deliberate strategy would make the decision-making to slow. However, there has been suggested that approximately 10 percent of operative decisions are of the analytical aspect (Eid & Johnsen, 2018).

Previous research looking at decision-making in extreme environments and how decisions could be affected by extreme environments, portray the importance of the operator conducting the key decisions in extreme environments need to have an understanding of generic patterns of high-risk environments, detection of anomalies, adaption to changing conditions,

anticipation, observability and directability of collaborating agents (Militello, Sushereba, Branlat, Bean, & Finomore, 2015, p. 253).

The recognition-primed decision model has some internal variations (Lipshitz et al., 2001), and similar for all these variations is that they depend profoundly on expertise. The first variation is simple, the decision-maker perceives the case to have certain types of actions that are appropriate, and these are usually successful. Here the decision maker relies on expertise that provides a sense of typicality that allows her to quickly categorise situations and recognise how to proceed as an aspect of categorisation. The second variation shows what a decision-maker does when the situation is not evident. The decision-maker will in this case rely on story-building capabilities to mentally simulate the narrative leading up to the observed features of the situation. Here the decision-maker relies on expertise in the sense of constructing mental models needed to find one explanation more plausible than others. The third and last variation, describes how the decision-maker could evaluate a course of action without comparing it to other cases. The decision-maker mentally simulates the course of action, to see if this would work, and then considers unintended consequences that might be unacceptable. Here the expertise is an ability to mentally simulate a course of action, and then anticipate how it would play out (Lipshitz et al., 2001, p. 336).

These three variations show how a decision-maker can manage the constraints and stressors often found in field settings. Under extreme time pressure, the first variation will result in a quick reaction without performing an analysis. Under uncertainty, the second variation will give the decision-maker a plausible set of alternative narratives that can help her to interpret and categorise a situation. Under shifting conditions, the third variation will give the decision-maker capacity to react quickly, without having to re-do an analysis (Lipshitz et al., 2001).

Klein (1998) explains that the recognition-primed decision is best applied in situations when there are reasonable experiences to draw on, when decision-makers are under time pressure, and when there is uncertainty and/or unclear goals. However, previous research discloses the fact that occupations with strict automated working environments, such as pilots, struggle to build up experience to use in unforeseen events. Pilots are trained to use their analytical decision-making, which is in accordance with the standards of aviation (Bengler & Hoermann, 2015). Furthermore, the advantage with RPD is that it permits the guide to take quick decisions, without considering all available actions. Since time will often be of the essence, these decisions can be performed before it is too late (Eid & Johnsen, 2018).

The recognition-primed based (RPD) model by Klein (1989) has been highly influential in shaping the NDM perspective (Militello et al., 2015).

3 Methodology

“If you want to know how people understand their world and their lives, why not talk with them?” (Brinkmann & Kvale, 2015, p. 1). The process of choosing my methodology was designated through the thesis’s problem definition and its research questions. In this chapter I will explain the reason of choosing qualitative research as method. By describing the methodological choices before and under the processes of drafting this thesis. Starting with the clarification of my research strategy, continuing with materials and data sources, and then how these were analysed. Following with an evaluation of methodology and ethical consideration.

3.1 Research strategy

To choose the method for a thesis means that the researcher should acknowledge the research question and choose the best fitting methods of performing research. Having the aforementioned in mind, there is two different approaches that a researcher can decide between, qualitative and quantitative methods. A quantitative approach would be best suited if applying measurement procedures to social life, while qualitative research is based on using words in the presentation of analysing society (E. Bell, Bryman, & Harley, 2019). In other words, the researcher could choose between numbers or words. A quantitative method uses numbers and statistics to describe differences and findings within a population, while a qualitative method is pursuing a description of a social setting (Blaikie, 2010). Furthermore, where quantitative research will be as generalisable to the relevant population, the qualitative research pursues a deeper understanding of behaviour, values, beliefs, and so on in term a more contextual understanding of an phenomena (E. Bell et al., 2019).

In this thesis the reasonable way to answering the research question was to pursue the qualitative methods. Postholm (2010) describes that qualitative research is appropriate applied when the research involves the inquiry to understand the participants perspectives.

This is in conjunction with what Dalland (2017) describes as the way to capture opinion and experience that cannot be quantified or measured.

In consideration of the previously established argument to use qualitative methods, the coming phase was to select the way of conducting this research. Based on the timeframe of this thesis there was convenient to work with qualitative interviews. There are distinctive ways of handling interviews: from the likes of ethnography to structured interviews. Hence, semi-structured interviews were exceedingly precise approach for this thesis. The researcher has the opportunity to choose between an unstructured interview and the semi-structured interview (E. Bell et al., 2019). Where the unstructured interview focuses on the remarkably similar characters of a conversation (E. Bell et al., 2019; Burgess, 1984), the semi-structured interview focuses on fairly specific topics but does as well let the researcher gather details not included in an interview guide (E. Bell et al., 2019). This design will let the researcher chase details that the informants may unfold, but at the same time the interview guide (Appendix 1) gave me a chance to ask all questions in every single interview. In such way the conversation of an unstructured interview gave the informants much more flexibility, but it was harder to assure that every informant reflects on the same matter. Since the focus of this thesis is to review how guides tend to do decisions in critical situations, it was logical to pursue the semi-structured interview as the researcher have a fairly clear focus versus a very general focus on the topic. Consequently, the semi-structured interview focuses on that the more specific issues can be addressed (E. Bell et al., 2019).

3.2 Materials

The interviews were focused on Arctic Nature Guides working at Svalbard. The objective in these interviews was to develop and discover an understanding of how the Arctic Nature Guide establish decisions in uncertain situations. Both by their assessment of risk and how the risk picture shape their decisions. By conducting interviews over a time span of 30 to 40 minutes over Teams, Messenger, or Skype, I accumulated adequate data to analyse. There was a total of nine ANGs (Arctic Nature Guide) that voluntary participated in the interviews. Additionally, the interviews were established based on an interview guide, but as displayed earlier the interview guide was based on topics with various open questions related to the

research questions. In addition, the interviews were conducted in either English or Norwegian after what the informants were comfortable with.

Selection of informants

The selection of informants is by nature defined through the context of guides working at Svalbard. Another point was to choose informants with a competence entrenched in a certain certification. This certification is obtained through a year of education that includes practical and methodical work for the students. The Arctic Nature Guide study educates professional guides, and the learning is grounded on perspectives in a program based on different subjects: “Safe guiding in the Arctic”, “Value-based Guiding and Teaching Arctic Nature”, “Arctic Safety and Field Leadership” and “The History of Svalbard” (UiT Norges Arktiske Universitet, 2022). With this in mind, my informants were gathered on the background of my own network and other known Arctic Nature Guides.

An important detail for the process of selecting my informants was to reach informants that had histories and experiences which is rooted in personal experience. This required what Repstad (2007) explain as first-hand sources and will increase the reliability of the source. Hereby, the informants have been in these situations themselves.

Furthermore, the informants in this thesis had different work experience after accomplishing their year of study. Based on both this and suggested informants from other Arctic Nature Guides, I acquired a foundation of informants for the thesis. Moreover, it was important to not perform heaps of interviews considering that there is a risk to be overwhelmed in the amount of data. This could result in a poor and uncoherent analysis and interpretation of the materials (Brinkmann & Tanggaard, 2012). Subsequently, reaching 9 interviews resulted in no added information that had relevance for the thesis. I had reached what Brinkmann and Tanggaard (2012, p. 21) describe as “the saturation point”, where the informants repeat the same matters and information.

Additionally, I had no criteria of the variables sex and age since this has no relevance in the thesis’ problem definition. However, an attempt was performed to obtain a certain distribution on these two variables.

The following table shows the informants and their experience as guides at Svalbard:

Table 1 - List of informants

Informant:	Experience:	Key experience:
Informant 1	8 years as guide. ANG education.	Several expeditions in the Arctic. Kayaking in the Arctic. Snowmobile trips in the Arctic. Longer ski trips in the Arctic.
Informant 2	6 years as guide. ANG education.	Boat operator and snowmobile trips in the Arctic. Longer ski trips in the Arctic. Courses from Arctic Safety Center. Svalbard Guide Training Course.
Informant 3	5 years as guide. ANG education	Longer ski trips, kayaking and snowmobiling in the Arctic. Additional courses in glacier travel and avalanche.
Informant 4	3 years as guide. ANG education.	Snowmobile trips in the Arctic.
Informant 5	5 years as guide. ANG education.	Longer ski trips in the Arctic. Snowmobile trips in the Arctic. Glacier travel in the Arctic.
Informant 6	3 years as guide. ANG education.	Snowmobile trips in the Arctic.

Informant 7	7 years as guide. ANG education. Lived in Longyearbyen since 2013.	Boat operator and snowmobile trips in the Arctic. Experience as Guide manager. Additional courses in glacier travel and avalanche.
Informant 8	12 years as guide. ANG education.	Longer ski trips in the Arctic. Boat operator in the Arctic. Glacier travel in the Arctic. Avalanche and glaciers courses.
Informant 9	8 years as guide. ANG education.	Longer ski trips and snowmobile in the Arctic. Several expeditions in the Arctic. Dog sledding and glacier travels in the Arctic.

3.3 Data collection and analysis

E. Bell et al. (2019) acknowledge thematic analysis as one of the most common approaches to analysing qualitative data. By looking at the data material, one could start the analysis by establishing pattern within the data that justify it by being a theme. This could be seen as repetition within a certain interview or across the different interviews. However, it must be relevant to the research question or the research focus to be considered being a theme worth pursuing (E. Bell et al., 2019). To start the data analysis, I begun the coding sequence and decided to do this by fragmenting my data. By coding the data in such way that it is possible to understand the initial transcripts. Basically, obtaining and reviewing the different interviews was the first step in my coding sequence. Later on, I followed this with the matter of what E. Bell et al. (2019, p. 533) describes as: “recoding, comparing and consolidating, and re-grouping the codes to generate concepts”. This made my code easier to interpret and lead to the final level of coding. The next step was to consider the interconnections and to reflect about the properties in the codes at hand. This led to seeing the data collected through the

codes, and to identify codes and concepts as dimensions of a broader phenomenon (E. Bell et al., 2019).

The reason to code it in this way is to reduce the data material into further manageable themes. These themes were then related and gathered under various categories, this reduced the data in a fashion that was coherent and more straightforward to present in the empirical findings. Kvale and Brinkmann (2009) believe, in the same way as E. Bell et al. (2019), that this is the most common way of analysing qualitative data. On the pursuit of themes, Ryan and Bernard (2003) suggest probing after repetitions, typologies and categories used by interviewees, metaphors and analogies, transitions of topics, similarities and differences, linguistic connectors, reflect on missing data and the theory-related material.

Coffey and Atkinson (1996) reveal that codes should not only be thought as the way of fragmenting the data and retrieving of text, but it should as well be the introduction of mapping more general and formal features of theory that are being developed within the codes. By preserving the interview as the researcher is conducting the coding and doing this in a carefully procedure, Daland (2017) specify that the researcher avoid deteriorating to much of the original interview. The coding was done in the software program NVivo.

3.4 Evaluation of methodology and ethical considerations

In this subchapter I will show how I have worked with the methodology, and which ethical considerations I had in mind. Furthermore, I will present critique of the methodology and reliability and validity.

Critique of methodology

By fragmenting data there is a possibility of losing context of what the informants have said since there are 30-40 minutes long interviews that are disintegrated out of their context, one could argue that some of a social setting is lost. Another point is that when the researcher does the fragmentation of data it seems to remove the individual wholeness of what the informants have said. This is in equivalent to what (Marshall, 1981) finds difficult when structuring her data. However, there is a risk that the researcher fails to comprehend what they

have seen or heard, but this must be weighed against the fact that only after you have thought on, evaluated and theorised your data can your result become meaningful (E. Bell et al., 2019).

Reliability and validity

Some qualitative researchers tend to use the terms' reliability and validity in the similar ways to the quantitative researchers when seeking to establish criteria for assessing research. E. Bell et al. (2019) present an alternative criterion for evaluating qualitative research. These two primarily criteria for assessing are trustworthiness and authenticity. Trustworthiness is additionally made up on four criteria: credibility, transferability, dependability, and confirmability (E. Bell et al., 2019). Likewise Repstad (2007) describes these alternative criteria as adequate and practical in qualitative research. Not to mention, that Guba and Lincoln (1994) disclose that they are critical of the view that there are unconditional truths in the social world to be unveiled if one should use reliability and validity as establishing and assessing the quality of research. This is because these criteria imply the possibility of a single absolute account of social reality. They appeal that there could be more than one, if not multiple, accounts (E. Bell et al., 2019).

Following this account, E. Bell et al. (2019) present the background of the term credibility. Due to the potential that there are several versions of social reality, the researcher must prove the results' credibility. By ensuring that the research is carried out in a satisfactory manner and submitting the findings to members of the social world who were studied for confirmation that the researcher has correctly understood the social world under consideration (E. Bell et al., 2019, p. 363).

Secondly, the term transferability is another term that is essential for qualitative research. After all, the qualitative findings tend to be orientated to the contextual uniqueness and significance of the aspect of the social being studied (E. Bell et al., 2019, p. 365). This is due to the fact that the study focused on a limited sample of people who shared particular features. By displaying rich accounts of the details of the social culture, also described as thick description (Geertz, 1973), according to Guba and Lincoln (1994), this will give others with a directory from which they may make decisions on the transferability of discoveries to other sites (E. Bell et al., 2019).

Along with the two above mentioned, the third term is dependability. E. Bell et al. (2019) explains that it is a parallel to the reliability used in quantitative research, but instead the term dependability is practiced in such ways that the qualitative research is trustworthy. This would then be done by approaching the research in such way that complete records are kept of all phases of the research process – problem formulation, selection of research participants, fieldwork notes, interview transcripts, data analysis decisions (E. Bell et al., 2019, p. 365). In the same way that Postholm (2010) describes the process of what the researcher's importance to describe and prepare the reader with established game rules in every phase of the research.

Additionally, confirmability refers to the researcher's ability to demonstrate that he or she acted in good faith. There is important to recognise that complete objectivity is impossible for the researcher (E. Bell et al., 2019). This means that personal views or theoretical preferences should not be allowed to bias the conduct of the research, or the conclusions drawn from it (E. Bell et al., 2019). That is why the data collection, processing, analysing and interpretation should be done with self-criticism, and that the researcher give the importance of proclaiming he or her own quality assurance, and to express and discuss towards them (Repstad, 2007).

As well as displaying trustworthiness, the other criteria was authenticity. Since the qualitative researcher' conceptions and theories are representations, Lincoln and Guba (1985) suggest that there may be alternative equally believable representations of the same phenomena (E. Bell et al., 2019, p. 365). This raises issues concerning the wider impact of research. As a result, the researcher will be responsible for presenting the various points of view within the observed social setting (E. Bell et al., 2019)

Under the gathering of data and the analyse I worked thoroughly. Directed by the methodological chapter, I exercised discretion and critical thinking. Gathering of data, processing, analyse and interpretation should be done with self-criticism in the quality assurance of a research project (Repstad, 2007). By expressing my own quality assurances, relating to transparency, and discussing this constantly through the methodology chapter, the reader could see how I have pursued the significance of trustworthiness.

When I chose to use the qualitative interviews as method for gathering data, I had to understand the significance of both my own and the informant's interpretation of the situations they described. As explained earlier, the researcher should keep in mind that it is important to present the different viewpoints observed. However, I could have interviewed various levels

of the branch in the guiding industry to get different perspectives, although I concluded to direct my awareness towards the people that absolutely is performing these decisions outside in the Arctic. Another point is that the majority of my informants were men. I tried to propose the opportunity of participating to several women, yet it ended up with a greater number of men. This could have affected the research.

Furthermore, by ensuring that the interview was representing the actual process of deriving to a decision, I had to be certain that my interview guide was based on the theoretical background of my research questions. By following these steps, I practiced the steps of authenticity.

Preconceptions

There is difficult, or rather impossible, to compose a thesis without any preconceptions of how phenomena emerge in a high-risk situation and how to deal with it as its unfolding. Dalland (2017) elaborates that a researcher should try to encounter the phenomena without preconceptions, but as established earlier, it is hard to sidestep the fact that the researcher may have previous knowledge and experience.

It is in the interest of the researcher to be as inductive as possible. Nevertheless, Postholm (2010) acknowledge the fact that the preconceptions will influence the theme in the thesis to some extent.

On the account of the preceding statements, it is a necessity to include my interest of the subject and my background. The reason that I found this theme interesting is because of my earlier education and work as an Arctic Nature Guide. My earlier education includes one year at Svalbard where I participated in the course Arctic Nature Guide through my bachelor in “Arktisk Friluftsliv og naturguiding.” Additionally, I have worked with guiding at Svalbard and at other destinations in Norway. This will influence the thesis, although by further studying theory before writing the thesis resulted in a broader foundation to understand the different perspectives on how to reach a decision. This resulted in greater knowledge and competence about the theme of the thesis. It is important to be as inductive as possible, but it is important to display the fact that preconceptions as a researcher will always shape the research (Postholm, 2010).

Furthermore, being a “insider” gave me some certain advantages that an “outsider” may struggle to achieve. These pros are related to my earlier knowledge of being a guide (Greene, 2014). Hence, I had no problem to relate what I was studying (J. Bell, 2005). Another point is that the researcher has an ability to ask more meaningful questions and understand non-verbal cues, and essentially presenting a more forthright, accurate understanding of the phenomena (Merriam et al., 2001, p. 411).

As a result of this, the interaction between the guides and the researcher are more natural. Because of my familiarity with the setting of being a guide I was more than welcomed to talk about a profession that both the informant and the researcher understand (J. Bell, 2005; Greene, 2014). Moreover, as a former guide I had easy access to guides that was more than happy to help me out. I accessed the field more immediately and personally (Chavez, 2008).

However, there is flaws related to being well-known with a phenomenon. It is argued based on the familiarity that the perception of the researcher could be too narrow (Aguiler, 1981). Another argument is that the researcher could be too subjective, and that the researcher makes assumptions on their prior knowledge and experience (Greene, 2014). By explaining to the guides that they had to talk about taking decisions and everything related to this as I was unaware of how it occurs and functions. This made me act like I did not know certain things when the informants talked and said, “You know what I’m talking about.” This is a successful tactic that Chavez (2008) and other insider researchers is applying (Greene, 2014, p. 4). Not making assumptions was something I focused on when the informants were answering other questions than the one appealed from the interview guide. Even though I got an “answer” on the coming questions, I asked the questions to be certain that I did not misinterpret and get different data from the various interviews.

Furthermore, bias is a problem considering that the researcher is well-known with the phenomena being studied. The researcher's bias is the process where the “researchers' beliefs, experiences, and values influence the study methodology, design, and/or results” (Greene, 2014, p. 4). Therefore, I had to be careful with embossing my view onto the informants. At the same time, Aguiler (1981, p. 26) explain that the researcher must not fear bias: “the insiders biases may be a source of insight as well as error”.

Ethical considerations

When conducting research, one should always be aware that one should conduct it in an ethical judicious approach. It is vital in the writing of a thesis, that people participating do not suffer negative consequences because they participate (Johannessen, Christoffersen, & Tufte, 2010). By building a relationship of trust to the informants one creates a connection with trust and transparency, and by informing as much as one could before the research begin is a way of doing this (Postholm, 2010). This means that one should not seek personal questions that puts the informants in a difficult place. In the preparation of the interviews, I tried to assume the difficulties the informants would be influenced by. An example is that questions related towards decisions and risk could in fact result in description of a situation where the informant had decided towards something that resulted in unjustifiably decisions. However, with this in mind, I tried to stay as impartial as possible.

By sending out an information letter and a consent of participating in the research (Appendix 3), the respondents were informed that their anonymity was ensured and that it was voluntary to participate in the research. In this information letter the respondents got further information of what exactly this thesis was researching, and that their interviews would be part of the data used in analyses and further making the findings in this research project. Furthermore, the participant was explicitly told in the letter that they could at any point withdraw from the research, and this was verbally expressed before the interview started as well. Including the preceding cautiousness, the informants was informed to ask questions if something was unclear both during the interview or afterwards. None of the participants decided to use this right.

Additionally, this project was reported to and approved by NSD (Appendix 2).

4 Empirical findings

In this chapter the empirical findings are presented. Here I present factors that affect the decision-making process, how the guides reach their decisions and how they make decisions. The chapter is divided into the following subchapters: competence and experience, learning by mistakes, length of the trip, guests experience, perception of safety vs experience, planning and mental strategies.

4.1 Competence and experience

There is an undeniable appearance that most of the informants emphasise competence and experience when portraying circumstances affected by earlier knowledge. Nevertheless, the informants have varying competence and experience based on different work within the guide occupation, still they immensely acknowledge the significance of know-how (Informant 1,2,3,4,5,6,7,8,9). One of the informants points out when answering what is affecting his decision to be the right one:

“Good questions. I think it is the 8 years of experience that is existing in the background. And then it is there, you don’t really know why, but there is a bad feeling. I think is experience-based. You have seen so much weird with 8 years in the occupation, so you start to have a big mass of situations to draw from”.

Most of the informants mention this “bad feeling” that the informant mentions, and that it is based on experience. However, they describe it differently. Informant 4 describes it as a: *“It’s kind of like following the gut feeling”*, and Informant 5 specifies it as intuition. Additionally, Informant 5 exemplifies that preparation is key for his competence building. He specifies that taking courses with focus on pattern recognition and situation-based learning is crucial for facilitating advanced experience and competence. However, he claims that courses focusing too much on certification could be troubling; plans with pattern of action and to follow these plans subserviently. Furthermore, he reveals that self-confidence is the essential part in experience and competence, and it is further catalysed by courses with the right focus.

Aligned with Informant 5, Informant 9 mentions that one of his thoughts when it comes to handling situations is his competence building. However, he presents that his plan was to experience so much severe weather and rough situations that withstanding and coping with himself would be a routine. Furthermore, this would then implement a subconscious that is previously known to handle these situations, so the focus then is solely managing the guests.

Informant 2 underlines that preceding knowledge is important for her competence and experience, and how she handles the process of taking decisions. This is associated with what she acknowledges as situations she is comfortable with. Furthermore, she explains that if she is confronted by an unfamiliar situation or event, it is harder to proceed with the planned trip.

Previously mentioned, Informant 3 indicates the exact same with regards to being comfortable:

“I think that the common underline in the situations where I was decision-maker or victim, is that the person taking decisions had been in either a similar or exactly the same situations before and knew how to handle the situation.”

Lack of experience

When discussing experience, some of guides mention how lack of experience could affect their decisions. Besides, Informant 8 recounts the time when he was less experienced and how this resulted in what he describes as a strange decision. Previously the sea ice around Svalbard made it possible to prepare quite spectacular accommodations out in the fjords. “The boat in the ice” was one of these, and the guide was necessitated to cross sea ice to get there:

“The first trip I had resulted in the biggest curve inside Tempelfjorden you have seen, all the way to the glacier. Several kilometers extra, and the trip was very long. Longer than needed. But the grey surface water and the danger signs were there. With the experience I have today, I would have done something completely else.” (Informant 8)

With his first experience as first guide he was terrified to end up in the freezing water with his guests. Furthermore, he knew at that time that the ice was usually better further inside the fjord. This made him do something he perceives as unnecessary when reflecting back now.

Another point that Informant 6 makes, as a quite recent educated guide, is that when he accompanies guides with extensive experience at Svalbard, they tend to perceive situations differently. He further shows local knowledge, work experience with guests and more exposure to different situations as key factors in different decision-making between guides.

4.2 Learning by mistakes

Most of the informants mention the learning process from mistakes to some extent. Two of the informants do not mention it all (Informant 5 and 6). Informant 1 points to what is influencing his experience and mentions mistakes. However, he also mentions the

circumstances where different guides learn from each other and their mistakes: *“I haven’t been in all stupid situations yet, just very many. So, it is possible that other guides have had guests that have created the most spectacular, and it is important to address that these guests do in fact exist”*. This is something that Informants 4 and 9 address as well.

Informant 2 directs her learning from mistakes towards being outside and experiencing different situations. She speaks of mistakes as a necessity to acquire new knowledge and experience: *“You learn from mistakes, but you need to have a certain foundation of both experience and safety to keeping it from being a catastrophe”*. This is an influential part of what Informant 3 reflects upon when conveying his thoughts as well.

Likewise, Informants 7 and 8 concentrate their learning from mistakes by presenting self-experienced situations where they made mistakes and handled the circumstances. Informant 8 recounted the episode where he, one other guide and a group of guests experienced harsh weather:

“It was many decisions that had to be made in what ended up as a.... It ended up in a rescue operation, a polar low pressure and a hurricane. Everyone worked together through the night (working to clear the tents for incoming snow). It was possible until one of the guests passed out, and then it was easy to make the decision to get help. When it started to influence life and health, it was an easy call. To portray the amount of snow, we attempted to dig out our ski boots and it was not possible. They were buried under two meters of snow, and inside the tent”.

Informant 7 mentioned an instance that resulted in an operation where he required help from the rescue services. Furthermore, Informant 9 tends to tell stories in relation to self-experienced situations as well. Fascinatingly, some of the informants tell these stories with a smile and amusement of how senseless they were in some positions, while other situations are humorless and thoughtful. However, this is associated with the possible outcome of the situation. Some situations have a high consequence, while other have a lower consequence.

4.3 Length of trip

Interestingly there is some different thoughts on how the length of a trip affect decision-making. Three of the informants aspire to not make differences between the two, while the remaining informants have other point of views. Informant 6 describe it in this way:

“While executing a short trip it is easy to think “No problem, I’m just 20 minutes from home. What is the worst that could happen?”. Still, you are only going up the local glacier Longyearbreen to watch the sun, you have to take the necessary precautions as if you were going on a longer trip. It is quite simply similar to packing your pulka, the only difference between one-night outside and two weeks, is the amount of food and fuel.”

Informant 2 do acknowledge this point of view, but she also includes her thoughts on the fact that there is no difference between the decision-making in the length of a trip. However, there is much of the same decisions, but the emphasis on the decisions is greater on longer trips. Therefore, she presents that you are taking many more decisions on a longer trip, the consequences of all these decisions combined could add up to be considerable higher than on a shorter trip. Informant 8 reveal that he has changed his perception of this matter because of some of his earlier mistakes and reflect on the fact that preparation and not stressing is important for both longer and shorter trips. Likewise, to the two other he announces that there is no difference, and that preparation and kit should be the same regardless.

While the former informants find it quite similar, Informant 5 indicate that he is fronting the length of a trip differently. Furthermore, he is basing his thoughts on the fact that when he is on longer trip, he focuses more on the preparation of being alone for longer times. He directs these thoughts toward receiving aid from rescue operation if needed, and that it will be harder at winter. Additionally, he has a quite humbling perception of how the guide is in fact working independently and alone, yet there is a limit to what guides could achieve in certain situations, and this train of thought end in a reflection of much necessary help from the rescue services in several situations. Along with Informant 5, Informant 9 recognise the importance of preparing for longer times alone. In the same way as Informant 5, he acknowledges the importance of the rescue services and the professionalism of their services. It appears that both Informants 5 and 9 devote several thoughts in this direction when planning their longer trips.

Furthermore, he continues that the longer trips are evaluated by the guide in the entire process of planning, preparing, and deciding for right cause of action. Here the guide could meet more irregular problems that are complicated to estimate. While the shorter trips are more like an assembly line with well-known complications. For instance, a 4-hour dog sledding trip that have been done thousands of times is exceedingly more predictable. *“The boss of any company with such trip could in fact tell me this, and this, and this could happen. If that or that happens, do this, but it is of course some unforeseen events in such trips as well”* (Informant 9).

In a different manner, Informant 3 connect the length of the trip with how much he could push people towards their limits. Where there is a bigger safety margin on longer trips, the shorter trips allow him to encourage guests to be more uncomfortable. He points out that there is easier to have a strenuous day when the town is in the vicinity. On the other hand, the long trips demand a certain vigilance from the guide. He describes that the guests must sleep in lesser comfortable accommodation and does not have the same possibilities to unwind in the evenings. That is why there is important to always keep the energy levels on the longer trips.

Informant 7 is absolutely in unison with both Informant 3 and Informant 5 in the way they perceive shorter trips versus longer trips. Where Informant 5 focus on aid on longer trips and Informant 3 considering more risky behaviour at shorter trips.

On the other hand, Informant 1 comprehend the shorter trips as trips with higher chance of something unwanted happening. Another point is that he acknowledges that the shorter trips provide him with less time to educate the guests. Where the long trips present improved time to inform and change erroneous behaviour.

Informant 4 consider the practical approach towards the two different lengths. Furthermore, he points toward the possibilities that lengthy tours give. There is a potential to be weatherbound or other factors that prepare the guide to establish a camp where the group will be until the problem is concluded. While shorter trips could contain more time pressure if the same problems occur.

4.4 Guest experiences

Transparent guiding is a term that nearly all informants bring up, and the rest is describing it in other words. Informant 3 characterise the process of being transparent as: *“When I’m with guests, I may do snow profile and show it to them. But I will not discuss the decisions with them, I will just tell them that I see this and that in the snowpack. Based on this I will take a decision. The guests don’t have any call in this. It’s just to integrate them in the thought process”*. Informants 1, 2, 4, 5, 6, 7, 8 and 9 illustrate trips where they had focused on these situations with describing their thought process. *“Transparent guiding is all about creating a good condition in the group. To create an understanding between the guide and guest”* (Informant 5).

Another interesting aspect of the guests experience and transparent guiding, is the situations where the guides must reveal that the guests does not get the trip for which they have paid. This could either be ahead of a trip or while outside. *“My job as guide is to keep the safety of my guests. Over experiences and adventures”* (Informant 6). This is an essential part of the job as many of the informants put it (Informant 1, 2, 3, 4, 5, 8, 9). Related to this, some of the informants mentions that they think it is difficult and unpleasant to either turn around or cancel the trip. Furthermore, Informant 4 mentions that some safety measurements could affect the tour itself. That the guest pays to arrive at some point, but that safety measures like going in rope team could affect the progress in such way that there is not possible to accomplish it.

Nevertheless, it is not necessary to cancel the trip or turn around at every circumstances. Sometimes there is possible to locate new alternatives or routes. This is mentioned by several of the informants (1, 3, 4, 7, 8, 9). Another point that Informant 3 present is that there could be a possibility to adjust the trip because of other factors linked with the guest. In some situations, the guests could be exhausted, and in this situation the guide decided to ski down ahead of the original goal. This could be seen together with what Informant 1 reflects up on: *“It helps to have been in the game for a while. Both in relation with the nature and the guests around you. It is easy to see if people struggle the way they drive (snowmobile) and adjust the tempo.”*

The guest experience is a great deal to the guides, and every informant indicate this somehow. Informant 8 relate the full experience as a carefully accomplished trip. Furthermore, he

underlines that the guides focus is not to demonstrate a risk-taking, touch and go experience where the guest feels unsafe. He recalls that when he first initiated this career and discovered ANG: *“When I first found the course, I found a sentence that I enjoyed: “Educating guides for safe travel in Arctic areas”. That is a great sentence. You have lost it as guide if the guests start to feel unsafe, and the experience will not be satisfying if the guest feel unsafe”*. In the same way, Informant 2 mentions that her private Svalbard adventure is something different than her work tours, and express that *“What do they get out of it? Absolutely nothing”*. However, Informant 8 mentions that some guests are more predisposed regarding further challenges. Generally, he tries to avoid unnecessary risk.

Furthermore, Informant 9 specify that one other aspect of guests’ experiences is that some guests are more robust and experienced than other, and that they pay for harsher trips than others. He portrays a ski trip where the group encounter what he describes as a hurricane while crossing north to south of Spitsbergen: *“When I had established the outline of the situation and that it was not dangerous, just shitty. As soon as I had confirmed that, you inform the guests that: “This is an unpleasant situation, but it is not dangerous for the time being””*. Additionally, it seems like Informant 9 deal with more guests in this calibre of experience and risk-seeking, than the ones that “just” want a hike in the near vicinity of Longyearbyen.

Not letting the guests obtain too much risk is a factor that guides focus on, and an interesting reflection on the other side of the spectrum, is that occasionally Informant 6 let the guests go in rope teams at glaciers although it is safe to go without. This is simply because the guests perceive this as an entertaining feature.

4.5 Perception of safety vs experiences

Quite naturally several of the informants mentions or describe their risk perception. However, there are several nuances within guides risk perception. Foremost, the uttermost specified thought towards risk is the guides perception of the safety of their guests. Informant 9 characterise his hierarchy related to experiences and risk when dealing with guests:

“I’m fully aware that my job is mainly to keep the guests alive from A to B. That’s job A. Job B is maybe that we get back without any injuries. And then C is that we reach

our goal. Lastly, job D is that we possibly have a nice trip. (...) I have also accepted a certain probability that someone could die, even though its teeny-tiny, we are skiing or snowmobiling at Svalbard.”

This is the foremost focus for several of the informants (Informant 1,2,3,6,7,8). Furthermore, Informant 6 always focus on the guests' safety. For him, this is alpha omega when handling guests and nature. Accordingly, Informant 7 describe his risk perception as rather conservative when talking about deciding for different options. Especially when there is little time to evaluate, and uncertainty involved. Correspondingly, Informant 8 concur that he also makes defensive route selections to avoid unwanted situations.

Safety regarding themselves

Along with that, the informants establish a distinct position in affiliation with their own safety when guiding guests. Some put their guests in front, while other put their own safety first. Informant 2 base her decisions on the safety of the group and herself. However, plenty of the decisions is solely based on her own safety. That because of her little trust towards guests being able to handle upcoming situations and an injured guide. One example is if she brings guests out in the polar circle boat. No one else has the knowledge and experience to manoeuvre the boat back to the harbour. This is further affecting her decisions if there is harsh weather incoming: *“then I turn around really fast, because no one else could take care of me”*. Another point she makes, is that as long she feels an assurance of her safety in relevance to warmth, not hungry, rested and everything going fine, she feels a presence of security and calmness. This will make the situation a controlled one. Interestingly, this is as previously mentioned with Informant 9 as well. However, he describes the process of incorporating the coping and taking care of himself into his subconsciousness, so that he could spend all his energy on his guests. Furthermore, if she is cold, hungry, and tired, she will probably take other decisions related to that she would never compensate with her own safety. Correspondingly, this is the thought of Informant 5, yet he is quite critical to himself when he first take decisions that affect his safety.

Nevertheless, Informant 9 has rather different approach towards his own safety. He is not afraid to do risky decisions that put his safety at risk. One example is when he drove his snowmobile into another snowmobile in an attempt to avoid a guest going over a cliff, and it

was successful without any harm to him or the guest. Moreover, he is extremely aware over the different risks that he encounters and that he sometimes puts himself in harm's way.

While someone is extremely careful with their own safety and others are in the other side of the scope, there are guides that is between the two aspects. Informant 3 mentions that he seldom pushes to hard out of his comfort sone because this will affect both the safety of the group and himself. However, he mentions that he will not completely freak, but maybe start to struggle if he goes out of his comfort sone. Thus, if he is not in his best mental place, the entire experience will be bad for the guests. This is something Informants 4 and 8 communicate as well.

Equals versus guests

While talking about decisions related to guests and bringing them outside, some of the informants mentions the difference between private trip and guided tours. It is not usual to let the guests advise on decisions at all, but as discussed earlier they are introduced with the thoughts and reflections of the guide. Furthermore, safety-wise the guide adjudges the situations and succeed as he or she prefer. However, this is different if the guide has other guides to confide with or being on private trip with equals. Informant 3 explain that he will include others that are known with the factors and have experience in the Arctic in the decision-making process. If there is time to do it. Furthermore, informant 4 describe that having others with the same background and knowledge make him more decisive in some situations. This is because then there is two or more persons agreeing on the decisions, you have more insight towards the situation at hand he continues.

Informant 6 also adds that when taking this collective decision there is room for greater risk-taking, and that when deciding alone with guests make him more in favour of safety precaution. Furthermore, this passivity towards risk is a natural part of being a guide, is a claim that Informant 7 address.

4.6 Planning

When discussing matters like polar bears, crevasses, sea ice and other factors, some of the guides usually start to reflect upon how to avoid these complications. However, some focus more on polar bears while other focus more on crevasses, sea ice and avalanches. There is anyhow a similarity between the informants and how they deal with situations like this. The guides describe how their route planning can eliminate some of the risks that they face (Informant 1,2,3,4,5,6,7,8,9). One of these examples is when the guests from Informant 9s trip declare: “*“Last year I went the from North to South on Svalbard, and I did not see one bear” the guest told me. Then I said to my guest: “Do you think that this is a coincidence?”*”. In relation to this, Informant 9 describes his continuous work with planning routes where he does not face polar bears, which is by avoiding the coastline and trying to be inland. Yet, there is a variance in how much the different guides relate planning to avoid these risks. Some of the guides emphasis a lot, while others not so much. Besides, there is as Informant 5 reflects upon, not always possible to remove the risk completely. This is because it is not possible to keep away from the risk, due to delivering the activity that the guests are paying for. Interestingly, there is a wide-ranging focus on preventing. Where one guide directs as much time to prevent as possible: “*Ideally you don’t want to take these hasty decisions, due to a well-prepared plan*” (Informant 1), some guides only mention this briefly.

However, Informant 7 priorities his plans in relevance to what product he is delivering, yet there is an uncertainty that he cannot foresee, and that is his guests. There is lots of information that is not possible to bear in mind because of this. Regularly the guide must have different plans in the back of their head and perform them in compliance with what their guests can manage. Accordingly, Informant 8 perceive planning as key for every decision being made subsequently and that the guests are a big part of the risk picture.

Situations can appear even though the guides have tried preventing them. The consequence could be major if you are not prepared, and several informants share this view. The guides reflect upon this planning in advance of the tour or trip. Here they describe looking at ice charts, satellite photos, maps, and possible dangers. An example showing this is when the group must cross a glacier, with known crevasses and snow that covers them. While polar bears are a quite active and alive threat, the crevasses are latent and just waiting for a misstep. So, then you know that there are areas where you want to go in rope team, and areas where there is not possible to camp or even risk it with rope teams (Informant 1).

Furthermore, some of the informants (2,5,6,8) reflect upon planning when describing the importance of having the right equipment when situations occur. Informant 5 underlines the concern he has related to having knowledge about the equipment and being in possession of it when needed. However, if you do not have the equipment and are prepared, you start to push things even further. Informant 8 says that this could result in situations that: *“if we don’t push through here, this situation is disastrous”*. He explains that with this attitude you take more risk, and in the end, you could reach an inevitable situation.

At the same time, planning could be a more short-term alternative than the long-term planning which is happening inside. *“Even though you make a plan in the morning, it is rarely followed”* (Informant 7). Quite a few of the guides reflect upon the matter of planning their next move in the field. In relation of being prepared on what could be around the next corner (Informant 1,2,3,4,5,6,7,8,9). Informant 4 describes the process of planning outside in the terrain as a process of questioning himself:

“You start to approach a place you know could be problematic. Where is it possible to encounter the polar bear? What do I think of the terrain in front of me? When you’re moving through the moraine on the east coast out from Mohnbukta, going up Agardhbrean to put up the camp at the end of the day. You know that this is an area with bad visibility. Quite possibly polar bear terrain. Then you get your rifle from the top of the pulka and put your it at your back”.

Since the plan could change quite drastically from the original, Informant 4 also describes the possibility of reaching a liaison through satellite phone with updated information. He considers this as a natural part of expeditions or longer trips. This is also a thought that Informant 5 shares.

4.7 Mental strategies

Decisions made on brief thought processes is brought up by every single informant. The overall ambition with these decisions is to select a suitable response to the situation. However, some of the guides mention that these decisions are a considerable part of bringing people out. These decisions are often made when situations appear rapidly. Thus, the guides must react swiftly to gain control or get away from what is happening. Based on many aspects

they determine their reaction and “hopes for the best”, as informant 3 puts it. This is the narrative of several of the others as well. Anyhow, the focus is to reach a decision that is good enough to manage the incoming events.

Some situations there are several possible decisions likely, and at other situations there is quite plainly one decision that is the most appropriate. Such situations could be when Informant 7 describe his meeting with a polar bear: *“It’s quite clear that when you meet a bear in a place where there is a tight space, then the decisions are made for you. Then you must scare the bear away the one way, while you try to get the group out the other way”*. However, it is not always as clear-cut as this situation. Every so often there are situations where the guides must comprehend several different elements rapidly. The likes of these situations could be as Informant 9 describes when to call for help (or not) while battling to keep the tents up when storm blasts.

When the situations are turbulent and on-going the guides describe this sensation of being rational and lucid. They exclude the insignificancies and become action-oriented: *“nothing else is important, and you go back to the basic-stuff. Your mind is fully aware and present. To get back home and everybody alive. (...). There is no doubt on what to do”* (Informant 8). Furthermore, they do not have the time to do risk assessments or any analytical thinking, they must react. Instinctively the guides “know” the right decisions and what to do.

Fundamentally there is important to have different experiences and make such decisions on former occasions. The guides describe that they look back at other situations and how they dealt with these. Also, they specify that even though they have not been in a certain situation earlier, they can draw from different experiences, training and knowledge and merge them to resolve a situation. The basis of solving earlier situations and combining knowledge, training and experience result in what Informant 8 characterise as a portfolio of decisions: *“When these critical situations where you have to decide appear, then I think that I have a portfolio of possible decisions in the back of my mind”*.

“War stories” and anecdotes

Using episodes and stories about earlier incidents is another part of reaching decisions and assessing situations. Nearly all the guides mention several stories where they had to assess the situation and decide for the proper outcome. It seems like the guides use these stories to construct their understandings. There are several stories to present, but here is one of them:

“For me it starts with going through the different scenarios. What is the worst-case scenario in this given situation and what is the best-case scenario? Should I call somebody to get her? That would take an hour. Is she so cold that she would survive an hour? If not, there would be really daft if I think no and then make that call. In this case I called Syssemmannen and informed them about the situation. “Yes, we are nearby Janssohaugen”. We are near the city. But it would take us an hour and a half to ride with the dogs. She will not manage that. It would at least take me an hour to relocate the dog sleigh. “I could call my boss to get him to pick me up, but now you know what is up”. She starts to get hypothermic, and she has frostbites in her entire face. But before I took the decisions and called Syssemmannen, I thought... How big of a crisis is this actually? Do I have an opportunity to fix it myself? With 25 dogs your kind of do not... Then we stood there in 25 minus degrees and there was a slight gale directly in the face. Is it possible to get the tent up? That would at least be 30 minutes of work with the dogs before I could start with that. She must get home... now. It is not possible with dogs. Then we have two opportunities: we have snowmobile and helicopter. There would take an hour with scooter, then our best shot is the helicopter” (Informant 9).

There is a common view of how the different guides use their “war stories”. The interesting part is that they challenge themselves with questions linked towards previous knowledge and experience in other situations. Then they use these situations to help assessing the situation at hand. However, there is a difference in how much they reflect on these questions and how many questions they ask themselves. Yet, they use these situations to build up awareness of the on-going events and to make sense of what is going on.

Assessing situations

The relevance of assessing the situation is certainly essential. The process of assessing is initiated long ahead of the trip and is a consideration the guide emphasises significantly. Furthermore, by the description of the guides there is reason to believe that earlier trip in the season is part of information gathering. The guide could have delivered the trip previously, which contribute with details necessary to comprehend parts of the trip. Planning is also a key in the assessment. The guides focus on weather, snow, danger signs and other elements that could affect the goal of the trip.

Nonetheless, the most important part of assessing this dynamic environment is when the group is outside in the terrain:

(When driving snowmobile in Todalen after much precipitation and wind) “It is all about getting an overview and gather the information you can before you drive into the valley. But at the same time, you must continuously gather more information and assess if it's actually safe to drive there or not, and then make a choice if you must turn around or to continue” (Informant 6).

The assessment is a part of the decision-making, but it is as several of the guides mentions: *“important to sort information in a good way and continuously know what I should do or where the situation is advancing” (Informant 5).*

The guides understand the assessing and information gathering in the midst of a situation could be quite hectic and chaotic, but as the situation changes it gives more sense as the situation becomes more recognisable. Furthermore, a few informants underline that the extraction of information is based on the experience you have from earlier. Informant 7 describe his collection of red flags as an activity where he searches for unsatisfactory cues in the environment around him:

“I look at different things in light of the group and the trip. It's going to start to be really windy and I'm going to cross this glacier. Is the group capable enough to drive through a whiteout? Do they listen to me when I give them commands? Watching the terrain further, is there something new happening?”

Likewise, this is a big focus in Informant 4's assessment of his situations. He also focuses on the resources he could use in case something happens in a certain situation. This is a view that several of the other guides share as well (3,6,7,8,9).

Climate change and assessing the environment

“There is another world to be a guide on Svalbard now if you compare it too earlier. You did not take any regards to avalanches at all. It was not a thing back then. Besides, you travelled on sea ice at considerably greater levels” (Informant 1).

Another influencing factor towards assessment that has arisen in the last decades is the changes in climate. This is a challenge that several of the guides mention in regards with risks (Informant 1,2,4,7,8). Less sea ice and more precipitation result in unsecure ice and more avalanche danger. The sea ice is influenced by warmer and more saline water. Fluctuating conditions in the sea ice make it a troublesome process to travel on the ice. This results in stricter rules when moving on the ice and much less travel on it. Furthermore, more snow to move into the leeward sides culminate in higher avalanche danger. This removes a lot of possible routes and in some cases cancelled trips. Previously the guides did not even think about the avalanche danger, now the avalanche training is part of a serious practice at different firms. With new standards, there are new and unforeseen events culminating.

Moreover, Informant 4 describes that there are more periods with mild weather and that it could be numerous polar lows.

5 Discussion

The problem definition for the thesis was

How does arctic nature guides make decisions in crisis situations?

The guides emphasize several factors that both influence the process of decision-making and mechanisms to reach various decisions. There are many aspects in the dynamic environment of the Arctic nature which could affect the decision-making process. First and foremost, the guide is bringing people with little to no former knowledge of how to function in this context. Operations such as guiding in the Arctic are challenging because of harsh and variable weather, darkness and rapidly changing natural hazards (Indreiten et al., 2018) and challenging terrain and wildlife (Wærø et al., 2018). These factors correlate with how risk is described as uncertainty concerning what would be the outcome or consequence of an activity (Aven et al., 2004). The guide is not only preserving the safety of the guests, besides this he or she must devote plenty of effort towards the product which the guests are expecting to enjoy. This could be problematic considering that safety measures do sometime eliminate the possibility of the experience. Additionally, the risk perceived by the guests could, and often is, different than the guides' perception. Risk perception is a natural part of risk and deals with how people understand, experience and deal with risk and danger (Aven et al., 2004; Renn, 2004). Furthermore, this could be seen in relation to Røkenes and Mathisen (2017) research, portraying that the guide needs to predict, understand and deal with people's understanding of risk and safety. Undoubtedly, this could end up in an uncomfortable situation for the guide who is cramped between taking the risk or moving towards the safer option. Since the guests are paying to experience the Arctic nature, where risk is a natural part of the adventure, there is a fine line between too much risk and safer options.

Related to this, where other high-risk occupations seek to de-escalate and stay away from situations with risk, the guide is actively seeking risk. Even though, for example an police officers' job (Henriksen & Kruke, 2020) is to deal with risky situations, they do not search for it in the same way as the guide. Contextually both must oversee risks, yet one part wants it to be as secure as possible while the other one is searching for these thrills. Where the police are 100% interested in reducing risk, the guide has a more 50/50% towards risk and safety to meet the guests' expectations and experiences.

Since the guide must deal with the expectations of the guests, they need to have ways of communicating their choices as they progress through the trip. This is done by including the guests on the thought-process and will result in less pressure on the guide, or at least some possible understanding of the choices being made. This is linked to the concept of transparent guiding (Røkenes & Andersen, 2016), which is based on the transparency and the importance of involving members of the group in the decision-making process: guiding in the nature at Svalbard includes risk management, valid assessments of nature and people and the ability to frequently communicate these assessments and is a core condition for safe and successful nature guiding (Løvoll & Einang, 2022, p. 15). Sometimes the situation necessitates a turn-around or a new route because of changes in the risks. Furthermore, as a result of including the guests into the perspectives of the guide there could be further acceptance of the choices being made. This is a crucial point for the guides since guiding is not about taking unnecessary risks where the guests are unsafe. However, this does not remove the fact that guests possess different competences and need to be challenged differently. This aspect contributes to further head scratching related to risk-taking for the guide.

Additionally, tours are restricted to a timeframe which means that the guide must bear in mind the progression of the group. If there are possibilities of risk in a situation where this is a problem, time pressure could make the guide disregard safe options like using certain equipment or the opportunity of changing routes. This present, in the same way as Engen et al. (2016) describes, that risks could occur from either a natural cause or as action done by human. Likewise, length of the tour is affecting the risk picture of the guide. Some of the guides think that there are no differences between various lengths, while others think the opposite. Some guides describe that the risks on the short trips are less uncertain rather on the longer trips because of the frequency and number of shorter trips that have been conducted. Where the longer trips are filled with more uncertainty, the shorter trips are an “assembly line” where a guide could do several trips a day. This leads to the perception of time pressure on short trips could be more influential than on the longer trips. Whereas the longer trips have more flexibility towards time. Furthermore, several of the guides think that being out for longer periods exposes them to more risk. Accordingly, one could see these different factors as part of cognitive heuristics (Engen et al., 2016; Renn, 2008) that could affect how the guide perceives the probability of a situation happening or not, and how they react towards them. With risk there comes great responsibility. Several of the guides describe their focus on safety, and there could seem like there is a clearcut understanding of the hierarchy between

experiences and safety, however this is not how it is in every circumstance. Biases (Renn, 2008) could be one of the reasons that this is not always uncomplicated.

Besides, there are differences between guides regarding their defensiveness related to safety. Not only do the guests need to be safe and understand the choices of the guide, but the guide also has a great focus related to their own safety. There is not a kept secret between the guides that the guests are a considerable part of the risks. This results in a broad scope of where the different guides handle risks regarding themselves. Although some guides try not to risk their well-being, some of the guides disclose stories where they have risked their own health in order to keep the situation under control.

Planning is a crucial factor. Since risk is something that the guide could use earlier experience and knowledge to understand, then these previous events could be connected to the regularity of how these risk situations play out (Pursiainen, 2018). The focus in the planning phase is various amongst the guides. There are obvious risks like polar bears, crevasses, sea ice and avalanches that are uttermost featured when considering plans. Even though the focus fluctuates, it does not mean that they do not think about other risks. Furthermore, the guides discuss ways of eliminating risk. Preventing risk is a natural part of crisis management (Kruke, 2015; Pursiainen, 2018). This begins ahead of any prepared activity and is prominent in how guides think. However, a few guides concentrate their planning exceedingly in the direction of preventive measures than others. Despite preventing, the Arctic is a dynamic and unpredictable climate. In such a setting there is not possible to purely base the planning on preventive thinking. By preventing there is less probability that the risk will ever appear, yet there is not possible to exclusively focus on preventive measures.

Together with preventing, the guide directs much of their planning towards being prepared for unexpected occurrences. Preparedness is another natural part of crisis management (Kruke, 2015; Pursiainen, 2018). The guide has no choice but to be prepared for the unplanned. Residual risk will exist after preventive measures (Aven & Renn, 2010; Engen et al., 2016), and necessitates preparedness. Guides aim their attention towards mitigation, response and recovery (Mileti, 1999) which are the views of crisis management (Kruke, 2015). By studying ice charts, satellite photos, and maps the guide tries to avoid areas related to different risks. However, it is not always possible to direct the route elsewhere since the interest of the guests' experience is crucial. Then the guide is required to balance between the two conditions in the pre-phase of crisis management. By preparing adequate safety equipment,

such as rifles or glacier equipment, the guide prepares herself for possible risky situations. This requires knowledge and experience in relation of using the equipment and with the risk at hand. Therefore, the length of the trip could be seen in correlation with planning since the guide deals with different potential consequences and possibilities of risk and should have the right toolset for the actual trip. Planning could also be seen in parallel with what Røkenes and Mathisen (2017) mentioned risk assessment and practical skills.

Training and competence building is an important part of being prepared for unexpected situations. This is strongly linked to the two other phases of crisis management. Since there is a coherence between measures in pre-crisis and the acute phase, the learning outcome will be deeply influenced by these two variables (Engen et al., 2016; Kruke, 2015). Several of the guides portray the importance of being well-known in similar situations and the equipment being used. Since familiarity and recognition is the main goal of crisis management (Kruke, 2015), the guide's explanation of own experience and competence show that this is vital in the construction of preparedness and preventive measures. Another point is that lack of experience could result in wrongful assessments of risks. Additionally, competence building of the guide is heavily influenced by learning by mistakes. Situations occurring as a consequence of guests' spectacular endeavors are discussed internally between colleagues and is a demonstration of guides learning from each other. Likewise, self-experienced mistakes build a folder with experiences that the guide will avoid in the future. Interestingly, a few guides portray the importance of having some experience and competence as a fundament from keeping the situation at hand to be a catastrophic event. Without doubt, learning by doing is a key in gathering experience and competence for the arctic nature guide. The ability to perceive future events and learn from their mistakes improves their level of preparedness and prevention for similar trips in the future.

Catastrophic events, or a crisis, necessitate decision-making to reduce losses. This thesis bases the term crisis upon Rosenthal et al. (1989) definition of crisis. This indicates that the guide has no other choice than to react to the situation in front of him. Therefore, this part could be understood as the acute phase of the phases in crisis management (Kruke, 2015), and is usually filled by numerous uncertainties which make the situation ambiguous (Hermann, 1963; Kruke, 2015; Pursiainen, 2018). Furthermore, decision-making in crisis situations propagates differently to normal decision-making in the Arctic (Wærø et al., 2018). Moreover, this is the area of NDM (Flin et al., 2008) and previous research demonstrates that there are different strategies related towards decision-making. The guide could choose

between the analytical approach which is a more calculated thought process (Eid & Johnsen, 2018). The guide does in fact use this analytical thinking from time to time, yet this is limited out in the field. This way of deciding is to a greater extent related to the planning phase of the guided trips. It involves risk assessments, route choice and avoiding obvious risks. Moreover, planning is like a mental preparation where the guide has “walked through” possible obstructions based on this slow-paced thought process ahead of the trip. Some guides use this method more than others. Comparable, earlier studies realised that operative teams in high-risk occupations such like fire departments, pilots and military personnel is not using this approach in their decisions (Brun & Kobbeltvedt, 2005).

What is more, is that the guide encounter situations where hastily, time-pressured, and less calculated thought-process is more relevant. Intuitive decision-making is where experienced practitioners, such as the guide, make decisions in a real-world setting (Eid & Johnsen, 2018; Flin et al., 2008). However, the guides indicate that their analytical planning ahead of trips influences the decision-making transpiring in the field. This implies that guides performing thorough planning, is benefitting from this while doing intuitive decision-making. The aforementioned could be seen in coherence with previous research demonstrating that pilots who are not actively engaging in contingency planning are far more likely to be overloaded by events in high workload periods (Bolstad et al., 2010). Furthermore, this could be seen in context of the crisis management were Kruke (2015) illustrate that recognisability, through preparedness, helps the decision-maker with pattern-recognition and later on with an adequate solution.

Nonetheless, the decision makers' challenges are not only restricted to deciding for different options, but making sense of the events and the conditions is just as important (G. Klein, 2015). The guides present different situations where they have decided on completing an action. However, there is reason to believe that their perception of what is happening is based on wrong impressions on some occasions. Many of the guides describe such failures as typically novice mistakes that they made earlier in their career. Previous research shows that high-risk occupations necessitate SA, and that missing SA could be critical. These problems related to SA are associated as causes of accidents dynamic settings (Flin et al., 2008). Nevertheless, the initiation concerning assessment of a trip is based on information that the guide has access to before the trip. Furthermore, this could be based on an earlier trip where the guide knows the conditions in the upcoming trip and information gathered from colleagues. However, the assessment of the situation does not stop when the guide crosses the

doorstep. This is a continuous process through the entire trip. Assessment and information gathering is a key part of creating SA. The basis of SA is the perception of the relevant elements in the environment (Endsley, 1995) and gives the guide the capability to achieve appropriate behavior as a response to the dynamic situations at hand (Smith & Hancock, 1995).

Earlier research explain that SA creates the foundation of the decisions being made and higher SA results in better decisions (Eid & Johnsen, 2018). There seems to be a coherence between this and what the guide displays when referring to situations where they must create their understanding of what is going on. There is emphasis on gathering the information in a satisfactory fashion and doing this repeatedly. To understand what is going on (Flin et al., 2008). Due to guides often encountering situations with risk, which is attributed with time pressure and uncertainty, the guide shall possess the capabilities of obtaining SA. This is performed through the three levels of SA. The first level demands that the guide understand relevant elements in the environment. Furthermore, the second level demand that the guide recognise and makes sense of this information considering their goals. If the guide reaches these two levels, the last and third level is to predict how the situation will happen (Endsley, 1995). Experience and training are highly influential in how the guides perceive different situations and this is further highlighted when the guides discuss how their experience and competence is developed further. This is coincident with previous research as SA is profoundly influenced by abilities, experience, and training (Eid & Johnsen, 2018; Endsley, 1995). Another factor that is influencing the achievement of having SA is all other factors that could affect how the guide perceives the environment. Such things could be workload, stress and complexity (Endsley, 1995). Interestingly, the diversity of guests that the guide brings out is a factor that could obscure the guide's SA. This is because of the substantial difference in competence of the guests. The guide must work swiftly to understand and get the right SA to have the proper understanding of how a guest could be a problem or not. Another point is that a group of guests that requires a lot of attention could clout the SA regarding other elements, such as the environment.

However, SA is not the only way of making sense of what is happening. Guides also use capabilities that refer to earlier experienced scenarios. Such anecdotes make an effective process of understanding what is going on and to achieve awareness. Sensemaking is related to understanding what has happened, as well as anticipating future situations (G. Klein et al., 2007; Weick, 1995). Even though sensemaking is understood as a process of going from level

one SA to level two SA, there are some internal differences between the two concepts. SA has a stronger focus on anticipating and being an automatic process, while sensemaking is a more deliberate process and is based on understanding situations by looking backwards (Endsley, 2015). The guide uses these anecdotes, based on earlier experience, to achieve SA for future events. Different cues in the environment “inform” the guide of similarities, and the guide is then trying to anticipate what could happen. However, the guide is not out of the woods just yet. Understanding and projecting events is just a small piece of the puzzle. The guide must act on the information and her current SA of the situation at hand. Furthermore, the guide is using their SA and sensemaking to produce what they call “short-term planning”. This is different from analytical planning before the trip where the guide has time and peace of mind, now the guide is in the field and planning her next move. Asking herself rhetorical questions like “where do we go, what are the elements telling me or how do I solve this?”. This is something Weick (1993) described happened when the Mann Gulch disaster went out of hand. The firefighters did not grasp the situation at hand and then these rhetorical questions ended up with incorrect interpretations.

The questions are whether the ongoing climate change will make these rhetorical questions worthless or if the guide is still able to use their experience in changing variation of natural risks. The guide could end up down the same road as the firefighters in the Mann Gulch disaster (Weick, 1993), and not getting the right picture of what is happening. Several of the guide mentions the climate change as a challenging impact factor on both sea ice and in avalanche terrain. Furthermore, there could be problems related to previous experience and learning that affect the SA in these situations. However, with experience situated in relevance to sea ice and avalanche the guide should be able to comprehend this. Yet, there could be such rapid changes that the guide is not able to converge on the right cues.

The experienced decision-maker benefits from the link between SA and decision-making (Endsley, 2000). Regarding sensemaking, recognition-primed decision making (RPD) has features of sensemaking in its dependence on past experiences (G. Klein, 1993; Weick, 1993). Semantic images (Renn, 2008) is part of the making sense of what is happening and is simulated by knowledge and experience. This gives guides the ability to decide on the right action based on probability calculations. Furthermore, the guides explain that they look for decisions that will solve the situation rapidly. Now this is in accordance with the response of the crisis management and the acute phase (Kruke, 2015; Pursiainen, 2018). A rapid situation warrants a rapid solution. The guide does not have time to comprehend painstaking

considerations (G. Klein, 1993), these decisions are part of the guide occupation and happen occasionally when bringing guests outside. However, there is difference in the consequence of different situations and the uncertainties. Some situations could have an exceedingly higher fallout than others, just like that the term crisis is used to describe these different events and different damage potentials (Kruke, 2015). Moreover, these rapid situations are based on decisions that are “good enough” to manage the incoming events, this could be seen in context of 70%-decisions that does the job (Eid & Johnsen, 2018). Furthermore, the guide does not have the time to sit down and perfectly plan what they should do next. The decisions are made out from an ambition of satisfactory, rather than a fully optimal decision (Simon, 1956).

Additionally, guides comment the fact that those decisions regarding what to do in certain situation is affected if there are other experts nearby. The guides describe that their decision-making could result in better decisions when they are collaborating with other guides. Furthermore, they relate this to the difference between guests and guides. Whereas guests are only introduced into the way the guide think and to explain the choices being made, the other guide will make his thoughts known and from this point on they decide together. The view of NDM describes that the decisions are being taken under uncertainty, with inadequate information, shifting goals, time pressure and risk – but more meaningful in this context, it describes how working in teams and being subject to organisations constraints is part of this decision-making (Flin et al., 2008; Hoffman, 2006; Lipshitz et al., 2001; Montgomery et al., 2005; Salas & Klein, 2001).

Accordingly, there is difference in the tally of total decision which the guide can perform versus other situations where there is a quite obvious solution. Alone or with other guides. Sometimes these situations are stocked with several elements that the guide must emphasise when conducting the decision. Furthermore, the guide is acting on his rationality and lucid sensation of the situation. This makes them action-oriented as some of the guide describe it and could be seen in coherence with what Løvoll and Einang (2022) describe as empowerment. Their instinct and gut feeling “present” a solution. This could be seen in connection with the term intuition and cognitive heuristics (Engen et al., 2016; Renn, 2008). Even though the guide has planned out strategies on how to deal with certain situations, not all crises are expected or function like you have predicted (Kruke, 2015). Then the guide will follow his intuition and deviate from the plan. However, these deviations could, and some

time is, necessary to handle the crisis. It's the guides own intuitive adaptation (Engen et al., 2016).

The aforementioned could be seen in light of the RPD model have variations. (1) under extreme time pressure the first variation will result in a reaction without any analysis. (2) under uncertainty the second variation will give the decision-maker different narratives that help her to reach a decision. (3) under shifting conditions, the third variation will give the decision-maker the capability to react, without re-doing his analysis (Lipshitz et al., 2001).

Fundamentally, the guide has a profound focus on experience and how these experiences influence decisions they are making. They describe that they do often look back at a situation and how they dealt with it then. Additionally, they mention that earlier situations could affect how they deal with situations they have never been in. They draw from experiences, but also training and knowledge, and blend them to deal with unfamiliar situations. This is similar to what Henriksen and Kruke (2020) present with police officers in uncertain and dynamic situations. Recognition-primed decision-making is best applied when having reasonable experience to draw on (G. Klein, 1993). Former research indicates the same thing: operators need to have an understanding of their high-risk environments, detection of the possible anomalies, adapting to the changing conditions, anticipate and understanding the collaborating agents (Militello et al., 2015). Furthermore, this could be seen in relation to the circular process of crisis management. As discussed earlier, crisis management creates familiarity and recognition when faced with uncertainty (Kruke, 2015), and is important as it makes the contextual preconception of how decisions are practiced in these crisis situations.

However, what if the cues do not match to what is going on in reality? Then the guide will “lock on” to what they perceive as the right decisions and complete an inadequate decision. There is reason to believe that human error can happen even with the most experienced guide, and that the recognition-primed decision-making will be inaccurate in some situations. This could be seen in relation to the aforementioned about missing SA. Reason (1997, p. 71) defines human error as “the failure of planned actions to achieve their desired ends – without the intervention of some unforeseeable event”. Even though the guide wants to deliver and complete the right decisions, there is a possibility that either cues or action is unsuccessful. With the increasing variation in natural risk as a consequence of climate change and the already dynamic risk picture in Arctic, this could be problematic.

6 Conclusion

In this thesis I have studied how the Arctic Nature Guide make decisions in crisis situations and what is affecting these decisions making processes. With the increasing number of tourists searching for adventure, risk, and new experiences in the Arctic there is formidable responsibility on the guide. Bringing people out safely and deliver experiences is a demanding task, which requires unceasing awareness of the environment around the group. However, not only must the guide pay attention to external risks from the nature that could influence the experience, but the guide must also consider aspects such as the length of the trip, guests' capabilities, their own safety, and the ongoing climate changes. Together with the cooperation with other guides, these factors could have a significance on the decisions-making process and how the situations are resolved.

The guide must balance between value creation towards the experience yet stay away from harmful events. With demanding guests, this task could be rather difficult because guests do not recognise the lurking dangers and the complications these can cause. This is interesting with regards to other high-risk occupations, which do not actively seek out risk situations and must de-escalate if they encounter one. Where police have zero tolerance for escalation of risk, the guides must balance between safety versus guest experience. Furthermore, this pressure demands absolute concentration from the guide which is attempting to not fall for the fallacies that cognitive heuristics could cause.

However, the guide tries to use cognitive cues to evaluate the information to stimulate recognition when facing crisis situations. Experience and competence are key factors in the ability to recognise circumstances that are similar or contains similar patterns as previous encounters. In these cases, the guide primarily practices intuitive decision-making, but the analytical perspective is applied in the planning process of the guided trip. Furthermore, the guides use this connection between the analytical and intuitive perspective to shape their situational awareness in the situation where decision-making is crucial. By analysing the trip ahead of it and projecting the future status of the situation, the guide is constructing the basis for the intuitive response in the confrontation of immediate danger. Being prepared grants the guide an advantage when the situation develops. This could result in an evasion of the situation or a rapid resolution to the problem.

Yet, it is interesting to keep in mind that a perceived solution does not necessary represent a correct decision. Even the most experienced guide is susceptible to mistakes. With the changing natural environment and the already dynamic risk picture in Arctic, there is a possibility that the guide could act on the wrong cues or that the response is ineffective.

6.1 Further research

Based on the subject of the thesis it would be interesting to have a further understanding of guests' expectations related to experiences in the Arctic, both from the more extreme guided tours and the usual tours. Since this is influencing the guides decision-making, it would be valuable to explore the connection between guests' expectations and the guides decision-making. Furthermore, another interesting factor that needs more research is the changes related to climate change and how these affect the guide. With the already dynamic risk situation in the Arctic, it would most probably influence the guided tours further.

Additionally, another suggestion is to further research the Arctic Nature Guides and how their training influence their decision-making. Training and experience are important in the crisis management cycle, and it would be of significance to further understand how the guide is preparing for these guided tours. There is a possibility to both join the ANG's in their education to observe and to examine how the guide train after their education is completed.

Completely in another direction, with climate change the waters around Svalbard is becoming easier to navigate because of less sea ice and cruise ships aim their attention on displaying the Arctic nature to heaps of tourists. It could be interesting to look further into the guides possible important decisions in bigger crisis, such as cruise ships capsizes with large numbers of tourists on board, where guides are the first responder to the accident site and needs to do complicated decisions.

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- **Can you explain how you make decisions as guide?**
- *Kan du forklare meg hvordan du foretar deg avgjørelser som guide?*

- **What happens if you must take a decision where you have short time to decide?**
- *Hva skjer om du må ta en avgjørelse der du har kort tid på å bestemme deg?*

- **Talk about how you think and reflect over decisions in situations where you have little time to decide**
- *Snakk litt om hvordan du tenker og reflekterer over avgjørelser i situasjoner med lite tid på å bestemme seg*

- **Purely hypothetical: What do you think about decisions considering what we have discussed when I mention: Polar bears, sea ice, crevasses, and snow bridges. And the arctic context: long distances, few people and climate change**
- *Rent hypotetisk: Hva tenker du om avgjørelser i lys av det vi har snakket om når jeg sier: vær, isbjørn, sjøis, bresprekker, snøbroer*

<p><i>osv? ← Arktiske forhold: lange distanser, få folk og klimaforandringer</i></p> <ul style="list-style-type: none"> - Are there any differences between short and long trips? - <i>Er det noe forskjell på korte og lange turer?</i> - What do you base your decision upon? How do you arrive at this decision? - <i>Hva baserer du avgjørelsene på? Hvordan kommer du frem til disse?</i> - Any statements I want elaborations from etc... - Do you have something more? 	
<p>Summary of the interview</p> <ul style="list-style-type: none"> - Is there something you want to change? - Is there something you want to discuss further? - Information about the way forward from the interview and how it is used in the project 	<ul style="list-style-type: none"> - Ask if everything is perceived the right way

NSD NORSK SENTER FOR FORSKNINGSDATA

Vurdering

Referansenummer

634855

Prosjekttittel

Decision-making in the Arctic: Making decisions in highly uncertain situations*

Behandlingsansvarlig institusjon

UiT Norges Arktiske Universitet / Fakultet for naturvitenskap og teknologi / Institutt for ingeniørvitenskap og sikkerhet

Prosjektansvarlig (vitenskapelig ansatt/veileder eller stipendiat)

Anna Maria Misse Wester, anna.m.wester@uit.no, tlf: +460703545921

Type prosjekt

Studentprosjekt, masterstudium

Kontaktinformasjon, student

Mathis Karlsen, mka137@uit.no, tlf: 95407290

Prosjektperiode

14.12.2021 - 31.05.2022

Vurdering (1)

27.01.2022 - Vurdert

Det er vår vurdering at behandlingen av personopplysninger i prosjektet vil være i samsvar med personvernlovgivningen så fremt den gjennomføres i tråd med det som er dokumentert i meldeskjemaet med vedlegg, og eventuelt i meldingsdialogen mellom innmelder og Personverntjenester. Behandlingen kan starte.

TYPE OPPLYSNINGER OG VARIGHET

Prosjektet vil behandle alminnelige kategorier av personopplysninger frem til den datoen som er oppgitt i meldeskjemaet.

LOVLIG GRUNNLAG

Prosjektet vil innhente samtykke fra de registrerte til behandlingen av personopplysninger. Vår vurdering er at prosjektet legger opp til et samtykke i samsvar med kravene i art. 4 og 7, ved at det er en frivillig, spesifikk, informert og utvetydig bekreftelse som kan dokumenteres, og som den registrerte kan trekke tilbake.

Lovlig grunnlag for behandlingen vil dermed være den registrertes samtykke, jf. personvernforordningen art. 6 nr. 1 bokstav a.

<https://meldeskjema.nsd.no/vurdering/61e03479-eea7-473c-95b3-8086e6ecf1e5>
07.02.2022, 14:43

Meldeskjema for behandling av personopplysninger

1/2

PERSONVERNPRINSIPPER

Personverntjenester vurderer at den planlagte behandlingen av personopplysninger vil følge prinsippene i personvernforordningen om:

- lovlighet, rettferdighet og åpenhet (art. 5.1 a), ved at de registrerte får tilfredsstillende informasjon om og samtykker til behandlingen
- formålsbegrensning (art. 5.1 b), ved at personopplysninger samles inn for spesifikke, uttrykkelig angitte og berettigede formål, og ikke behandles til nye, uforenlige formål
- dataminimering (art. 5.1 c), ved at det kun behandles opplysninger som er adekvate, relevante og nødvendige for formålet med prosjektet
- lagringsbegrensning (art. 5.1 e), ved at personopplysningene ikke lagres lengre enn nødvendig for å oppfylle formålet

DE REGISTRERTES RETTIGHETER

Så lenge de registrerte kan identifiseres i datamaterialet vil de ha følgende rettigheter: innsyn (art. 15), retting (art. 16), sletting (art. 17), begrensning (art. 18), og dataportabilitet (art. 20).

Personverntjenester vurderer at informasjonen om behandlingen som de registrerte vil motta oppfyller lovens krav til form og innhold, jf. art. 12.1 og art. 13.

Vi minner om at hvis en registrert tar kontakt om sine rettigheter, har behandlingsansvarlig institusjon plikt til å svare innen en måned.

FØLG DIN INSTITUSJONS RETNINGSLINJER

Personverntjenester legger til grunn at behandlingen oppfyller kravene i personvernforordningen om riktighet (art. 5.1 d), integritet og konfidensialitet (art. 5.1. f) og sikkerhet (art. 32).

For å forsikre dere om at kravene oppfylles, må dere følge interne retningslinjer og/eller rådføre dere med behandlingsansvarlig institusjon.

MELD VESENTLIGE ENDRINGER

Dersom det skjer vesentlige endringer i behandlingen av personopplysninger, kan det være nødvendig å melde dette til oss ved å oppdatere meldeskjemaet. Før du melder inn en endring, oppfordrer vi deg til å lese om hvilke typer endringer det er nødvendig å melde: <https://www.nsd.no/personverntjenester/fylle-utmeldeskjema-for-personopplysninger/melde-endringer-i-meldeskjema> Du må vente på svar fra oss før endringen gjennomføres.

OPPFØLGING AV PROSJEKTET

Personverntjenester vil følge opp ved planlagt avslutning for å avklare om behandlingen av personopplysningene er avsluttet.

Lykke til med prosjektet!

Appendix 3 - Information letter and consent

This was both written in English and Norwegian, but I will only present the English since they are similar:

Do you want to participate in my master thesis:” Decision-making in the Arctic: Making decision in highly uncertain situations”?

This is a request for your participation in my thesis where the goal is to research how the arctic nature guide (ANG) reacts in situations with small amount of reflection time and how you do your decisions effectively in these situations. This paper will give you more information about the main goals of this project and what participation will mean for you.

Goal

The research project will base its finding on your experiences and feelings within prior experienced situations where you had to make a quick decision. The reason I contact you is because you have educated yourself as an arctic nature guide and have prior work experience at Svalbard, and in the high Arctic. These preconditions will most likely affect your thinking and will also colour your knowledge about the operational context of arctic. The reason why this project is interesting for me is because I have also educated myself through ANG and worked as a guide, and because of this I think there is interesting learnings about the processes of making hasty decisions (In example: when you have to change your original plans). Based on this my temporary research question will be based on: “How does arctic nature guide react in crisis situations” with more elaborating questions as: “What is affecting the decision-making process of nature guides in these situations” and more questions related to the assessment and decisions making aspect. This project will be part of my master thesis study at University of Tromsø.

Who is responsible for this project?

Faculty of Science and Technology: Institute of Engineering Science (Institutt for teknologi og sikkerhet) is responsible for this project.

Why do you get a request for participation?

The reason you are in this selection is because of my network to the Arctic Nature Guide study and the Arctic Nature Guide Association. There would be you and other arctic nature guides who have either worked as nature guides or work as nature guides on Svalbard and in the high Arctic. In this project there would be you and 10-14 other guides being questioned to participate in my research project.

What is your involvement in this?

If you want to participate in my project, you must have an interview with me. This interview would take around 35-45 minutes. This interview would base on your experience, knowledge, and feelings. I will ask you open questions about decision-making, what you think about situations with little reflection time and other related questions. This interview would be recorded with a Dictaphone in such way that I can transcribe the interview later. Under the process of transcribing, I will make you anonymous.

It is voluntary to participate

It is voluntary to participate in this project. If you want to participate, you can at any point subtract your consent without any reason. All your personal data (such as your name) will be deleted. There are no negative consequences if you do not want to participate or subtract at a later point.

Your privacy and information – how do I keep it and use it

I will only use your information in in the objectives stated in this paper. I will keep your information confidential and in compliance with the privacy regulations.

On the institute of Engineering Science (Insitutt of teknologi og sikkerhet) there is only me, Mathis Karlsen, and my supervisor Anna Maria Misse Wester who has access to this information. Your name and contact information will be replaced with codes who is stored

separate from the name list and the interview, so that it is not possible to recognize you, and that it is not possible to connect it with the data I use in my thesis. There is only me who will transcribe these interviews in this project.

You will not be recognised in the completed publication of the master thesis. You will be anonymised in such ways that no one will know your name, and you will be coded to another name or simply “Respondent nr. (Something.” If you want, you can choose your own anonymised name! The information that is published in this thesis is only to be reflected and discussed upon in the discussion and conclusions part of the thesis and will be based on your interview. There would be no personal information in these discussions, only your thoughts, feelings, knowledge, and experience.

What are the proceedings later when the project is done?

The information would be anonymised when the project is approved, which should be in the end of May. The private information would be deleted at the end of the project, and the interview sound file deleted. It is only the transcribed interview, without private information and with a coded name, which will exist in form of the empirical presentation of the project.

Your rights

If you could be identified in the data material, you have the right to:

- Access to what personal information that is registered, and get a copy of this information
- to correct this information,
- to delete this information, and
- to file a complaint to Datatilsynet about the treatment of the information

What give us the right to treat information about you? I

treat this information based on your consent.

On assignment from the Institute of Engineering Science (Institutt for teknologi og sikkerhet) NSD – Norsk senter for forskningsdata AS assess that the treatment of private information in this project is in compliance with the regulation of data protection of privacy.

How can I find out more?

If you have further questions about the study, or want to use your rights, contact:

- mathis_karlsen@hotmail.com and my supervisor Anna Marie Misse Wester, email: anna.m.wester@uit.no

If you have question directed to NSD assessment of this project, contact:

- NSD – Norsk senter for forskningsdata AS on email (personverntjenester@nsd.no) or Telephone: 55 58 21 17.

Kind regards,

Anna Marie Misse Wester

Mathis Karlsen

(Supervisor)

(Student)

Statement of consent

I have received and understood the information about this project “Decision-making in the Arctic: Making decisions in highly uncertain situations” and had the opportunity to ask further questions. I consent to:

be part of this research interview

I consent to treatment of my information being processed until the end of this project

(Singed by project participant, date)

