Leadership and stress
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Abstract


The overall purpose of this thesis has been to increase the knowledge concerning leadership and stress in complex military and rescue operations. One of the biggest differences these leaders have to deal with compared to leaders in other kinds of organizations is the question of life and death. Their way of leading and handling stress may have consequences for their own lives, their subordinates’ lives, and often also other people’s lives.

This thesis is based on four empirical studies which include multiple research methods, e.g. both qualitative and quantitative approaches. Paper I and II focus on indirect leadership in a military context and the main result are that indirect leadership can be understood as consisting of two simultaneous influencing processes. The first one is action-oriented and consists of interaction with a link which filters and passes the messages down to lower organizational levels. The second process is image-oriented and consists of being a role model. In the favourable case, trust is built up between the higher management and the employees. However, in the unfavourable case, there is a lack of trust, resulting in redefinitions of the higher managers’ messages.

Paper III and IV focused on leadership in complex and/or stressful rescue operations. In paper III, rescue operation commanders from complex operations were interviewed, and in paper IV, quantitative questionnaires were answered by informants from the ambulance services, the police force and the rescue services. The main result are that leadership in complex, stressful rescue operations can be understood as consisting of three broad time-related parts: everyday working conditions, during an operation, and the outcome of an operation. The most important factors in explaining the outcome of a complex rescue operation were shown to be the organizational climate before an incident, positive stress reactions, and personal knowledge about one’s co-actors during an operation.

Keywords: leadership, stress, military operations, rescue operations.

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**List of studies**

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Introduction

Background
Being a leader often includes handling stressful situations, taking decisions and actions which could have implications for the leader him- or herself, for subordinates and sometimes also for an organization or a country. For a leader, these situations can be more or less challenging to deal with. The types of challenge a leader is exposed to, depends on which context the leader and the organization operate in.

Leadership can be crucial in many settings, especially during dangerous and stressful situations, like military or rescue operations. For this reason, military and rescue leaders are specially selected and trained to handle their daily tasks. Part of their everyday work is to be prepared to face new, challenging and sometimes dangerous tasks in order to save or protect lives. Many military and rescue operations have the character of being more routine work and are quite easy to handle and lead. But others can be more difficult to handle even if one is well prepared. This may depend on the complexity of the situation. A complex operation often involves more people, e.g. more personnel and more victims.

This thesis will focus on leadership in complex and/or stressful rescue operations within the military forces and rescue services. One of the biggest differences leaders in these kinds of organizations have to deal with compared to leaders in other kinds of organizations is the question of life and death. The way they lead and handle stress may have consequences for their own lives, their subordinates’ lives, and often also other people’s lives.

Thesis aim and research questions
This thesis focuses on the psychological perspective, taking its point of departure in two theoretical concepts: leadership and stress. In the research field of leadership, much research has been focussed on direct leadership, i.e. how decisions and actions affect the leader’s direct subordinates. Less attention has been paid to indirect leadership, i.e. how a leader influences and leads subordinates two or more hierarchical levels below him or her. This kind of leadership is however a common way of leading, especially in military or large-scale rescue operations.

Research on stress has a long history and covers a broad field. Thus much research has been done in the field. However there is a lack of knowledge when it comes to leadership in complex and/or stressful rescue operations.
As a consequence, the overall aim of this thesis is to increase the knowledge of leadership in military and rescue services operations. This thesis includes four papers and addresses the following research questions:

1. *How can indirect leadership in a military context be understood?* This question is addressed in papers I and II.
2. *How can leadership during stressful rescue operations be understood?* This question is addressed in papers III and IV.

**Outline**

The thesis consists of five chapters followed by the four individual papers. This brief introduction precedes an overview of the theoretical framework on leadership and stress. The third chapter deals with methodological considerations, related to the two different methods used in the contributing studies. The fourth chapter summarises the empirical papers included in this thesis. Brief descriptions of the background of each study are given, as well as a presentation of the study’s aims and methods, followed by a summary of the results. Finally, chapter five contains a discussion of the thesis, including practical implementations and suggestions for future research.
Theoretical Framework

This chapter examines two main areas: *leadership* and *stress*. Regarding leadership, a historical overview of some of the foremost leadership theories is presented, in order to provide a background and show how perspectives of leadership have changed over the years. Particular attention will be given transformational, developmental and authentic leadership models, as these theories could serve as a basis for leadership in complex and/or stressful rescue operations. As for the second area, stress, the chapter includes a historical overview of some of the influencing theories in the field of leadership and stress. Particular attention in this section will be devoted to different types of appraisals, individual factors and coping, as these are essential in understanding the issue.

Leadership

Images of leadership and leaders have fascinated and interested people for many centuries. Philosophers such as Plato, Aristotle and Machiavelli have tried to understand and explain different types of leaders and leadership. The issue has undoubtedly prompted several questions. For example, what is leadership? Are leaders born or made? The focus in this research area has shifted over the years from the leader to the context in which the leader exists. During the 19th century and industrialization, in particular the role of the military commander came to inspire leaders in business and organizations. Both the French Napoleon and the Prussian Clausewitz became pioneers, and key military principles were transformed into business and organizational learning (Björkman & Lundqvist, 1981; Andersson, 2001).

Definitions

On page 3 in “The Bass Handbook of Leadership” (Bass & Bass, 2008), the chapter starts with a quote: “A definition is a sack of flour compressed into a thimble” (Rémy de Gourmont 1858-1915). This quote is a good illustration when it comes to a definition of leadership. Even though leadership has long fascinated people in general and researchers in particular, there exists not a single uniform definition of the phenomenon. Instead there seem to be almost as many definitions of leadership as there are researchers studying leadership (Stogdill, 1974; Bass & Bass, 2008). Despite this, many researchers seem to agree that leadership includes several components or elements. Examples of these could be: processes, influences, groups and goals (see e.g. Grint, 1997, or Northouse, 2004). According to this, one example of a definition of leadership is made by
Northouse (2004): “Leadership is a process whereby an individual influences a group of individuals to achieve a common goal” (p. 3). Concurrently, it should be mentioned that there are certain leadership scholars who believe we have not come much closer to defining what leadership really is (Grint, 1997).

Identifying a single uniform definition of leadership may not be possible, or even necessary. In Sandahl, Falkenström and von Knorring (2010), leadership is compared with beauty. By that they mean that it is difficult to define, but when you see it you recognize it (p. 15). But the fact that there is no single definition should not discourage. Rather this lack, as in the words of Gardner, Lowe, Moss, Mahoney & Cogliser (2010) “is cause for celebration, rather than lament, given that leadership is a complex, multi-level and socially constructed process” (p. 952). Bass and Bass (2008, p. 25) argue that “the definition of leadership should depend on the purposes to be served.”

Although there does not exist a single uniform definition of leadership, this thesis is influenced by the following definition from Bass and Bass who advocate that: “leadership is the ability to influence, motivate, and enable others to contribute to the effectiveness and success of the organizations of which they are members” (Bass & Bass, 2008, p. 23).

A historical perspective
Images of leadership and leaders have long been an interesting issue. Much research has been done in the field, in a number of disciplines. From a psychological perspective a key question regarding leadership concerns “Who should rule?” (Hogan, Curphy & Hogan, 1994). This question includes several aspects, for example “How to evaluate leadership potential” (Hogan et al., 1994, p. 493).

Pioneering model
In the beginning of the 20th century, much leadership research was focussed on the personal traits of a leader. One model that sprang from this was Kurt Lewin’s description of three different types of leaders (Lewin & Lippitt, 1938). In this theory, the main point is that the organizational climate is a direct consequence of the type of the leader. The first type, the autocratic, is like a father figure who knows best and leads with a firm hand, making decisions without consulting anyone else. According to Lewin, one consequence of this type of leadership could be that the followers stop thinking themselves. The second leadership type, the democratic leader, which is the opposite of the autocratic leader, strives to make employees involved in the work. Followers are given choices and
decide collectively. Praise and criticism are involved in this kind of leadership. This kind of behaviour can lead the employees acting with greater maturity, both as individuals and as a group. The third type of leader is laissez-faire, which is characterized by giving freedom to the group for policy determination without any participation from the leader. The leader avoids leading and taking responsibility, and is actually a non-leader. This leadership style may occur when the leader does not want to or cannot lead (Bass, 1990). This kind of leader, or non-leader, can be fooled into thinking that he or she is a democratic leader, but this is not the case. According to Bass & Bass (2008), the democratic leader is the most favourable for an organization, especially long term, and that “the positive effects of democratic leadership are evident” (p. 457).

**Personality-oriented models**

Much research has been devoted to personality within several research disciplines (see e.g. Barenbaum & Winter, 2008; John, Robins & Pervin, 2008). Pervin and John (1997) explain that in psychology, and in personality psychology particularly, the focus on personality concerns individual differences between these consistent patterns. The assumption is that individuals have a predisposition to feel, think and behave in a certain way. These predispositions, or traits, have been found to be stable over time and situation, and are in Pervin and John’s (1997, p. 227) own words, “the fundamental building blocks of the human personality.”

Yukl (2006) argues that certain leadership skills are more important than personal traits for becoming a successful leader. Besides having sufficient technical competence, it is also required that the leader have social skills to be able to influence subordinates to work in the right direction. Personality traits are however important, for example as they affect a person in becoming a leader, as well as the leader’s tolerance to stress and the development of other necessary leader skills. Knowledge of these traits and skills are important and can be a good tool, especially in the selection of leaders. Yukl (2006, p. 189-197) presents a list of traits that are of special importance and that are related to leadership effectiveness:

- High energy level and stress tolerance
- Self-confidence
- Internal locus of control orientation
- Emotional stability and maturity
- Personal integrity
- Socialized power motivation
• Moderately high achievement orientation
• Low need for affiliation

Other studies that show how personality and leadership effectiveness are connected can be represented by e.g. Stogdill (1974). He found that surgency (e.g., extraversion, dominance and sociability) emotional stability (e.g., self-confidence and emotional control), conscientiousness (e.g., integrity and responsibility) and agreeableness (e.g., support and cooperativeness), can be positively related to a leader’s effectiveness. This way of describing leadership advocates that there is a connection between leadership and personality.

One way of studying individual differences is to measure these traits. Reasons for doing this could, for example, be to develop tests for diagnosis, education or selection (Barenbaum & Winter, 2008). There exist several different kinds of tests that measure these traits, but one of the most dominant ones in trait psychology, which is commonly used in selection processes, is the Five-Factor Model of personality. This model will be presented briefly below.

The five-factor model of personality
The five-factor model of personality (FFM), or the “Big Five” factors, is based on five different broad dimensions of personality which can be used to describe human personality (McCrae & Costa, 2008). In a review by Hogan et al. (1994), the authors argue that the Big Five model of personality could be a convenient way to summarize individual differences in a leader’s effectiveness. The following summary of these dimensions is taken from Costa and McCrae (1992, p. 14-16):

• **Neuroticism (N):** can be exemplified by depression, fear, embarrassment, anger and guilt. It could also refer to irrational thoughts, poor impulse control as well as poor stress handling.

• **Extraversion (E):** includes, for example, sociability, assertiveness, talkativeness, optimism and excitement.

• **Openness (O):** vivid imagination, sensitivity for aesthetic, intellectual curiosity and openness for new experiences are some examples of this dimension.

• **Agreeableness (A):** could, for example, be characterized by being altruistic, sympathetic and helping.
• **Conscientiousness** (C): can be exemplified by having great impulse control, being good at planning, organizing and implementation.

According to the Big Five theory of personality, a leader can be estimated from his or her *bright* and respective *dark* sides (see e.g. Nystedt, 1997). The bright side includes: extraversion, emotional stability, conscientiousness, agreeableness and openness. These bright sides have shown to have positive effects on a leader. Yet they do not appear to be a good predictor of how well a person will handle his or her role as a leader. A better predictor seems to be the absence of the darker sides. This includes lack of extraversion, emotional instability (neuroticism), as well as lack of conscientiousness, agreeableness and openness to new experiences. However these dark sides can be difficult to discover through interviews and tests of different kinds, especially if they are combined with social competence and high self-esteem. But even if the leader has one or more of these darker sides, Hogan et al. (1994), show that it is often possible to work with or possibly overcome these sides. This could mean that a leader with some darker sides needs more training and support than one without these darker sides. But even if the Big Five form a good basis for gathering information for the selection of leaders, it is still quite difficult to predict how one will function as a leader (Larsson, Carlstedt, Andersson & Andersson, 2003).

**Selection of military and rescue services leaders**

Both military and rescue services leaders are selected and prepared through education and training to handle difficult and stressful operations. They often work in different teams during an operation, and the operation may involve a risk to own lives. Therefore it is essential that there is mutual trust between the leader and the led. The following section will highlight these characteristics further from a trait perspective.

Leaders within both the military and rescue services are selected to carry out their tasks. Besides basic conditions like grades, they also must fulfill the physical and mental demands that are required (see e.g. Andersson, Carlstedt, Carlstedt & Widén, 2006; MSB, 2011). Through intelligence, personality and physical tests, they are selected for handling these kinds of work. However tests have their weaknesses and limitations. Wallenius (2001), for example, argues that it is difficult to predict how well an individual will handle a stressful situation on the basis of tests. Despite this limitation, tests can still be a good tool for selecting those individuals that would do poorly in such situations (Andersson et al., 2006).
The selection for higher positions in both the military and the rescue services is mostly done through internal recruitment, unlike many other organizations (Andersson et al., 2006; MSB, 2011). This depends on a situation where in hierarchical organizations both responsibility and power increases as you move higher up in the organization (Jaques, 1976). Knowledge of personal traits and skills are, however, important in the selection of leaders, when some traits and skills have proven to be more important than others in becoming a successful leader (Yukl, 2006).

**Sensation seeking**

Research has also shown that the personal trait of sensation seeking has significance for both the degree to which individuals expose themselves to stress, and also for what kind of coping strategies they use (Neria, Solomon, Ginzburg & Dekel, 2000). It has been shown that individuals with a high degree of sensation seeking often have a tendency to expose themselves to dangerous situations but that they also recover faster than individuals with low degrees of sensation seeking. Wallenius, Johansson & Larsson (2002) found that sensation seeking, or adventure seeking “was the most dominating motivation for applying” (p.77) to a military mission, but that this also could lead to leaders exposing themselves, their comrades or perhaps the whole group to unnecessary risks.

**Leadership behaviour-oriented models**

Leadership research at the Ohio State University started in 1945. During the next decades this group came to dominate the field. It started as a reaction towards the earlier focus of traits and came instead to focus more on the behaviour of the leader. Fleishman and Harris (1962) identified two major behaviours of “independent leadership” as they put it: consideration and initiating structure.

*Consideration* emphasizes behaviour based on mutual trust, respect and closeness between the leader and the group. Consideration between the leader and the group makes the group members feel more recognition and better integrates them into the communication and decision-making processes. *Initiating structure* relates to how the leader defines plans and organizes the work for the group. It also includes both performances and goal fulfilling (Fleishman & Harris, 1962, p. 43-44).

There are hundreds of studies of leadership, conducted in different contexts, using this theoretical model as a basis (see e.g. Lowin, Hrapchak & Kavanagh, 1969, for an overview). A common outcome of these studies is that the dimension *consideration* is necessary but not sufficient for successful leadership. The contexts’ or situations’ demand of *initiating*
structure should be included. One example could be that during highly acute stress more and stronger initiating structure is necessary, unlike in calmer conditions. A major criticism against the Ohio School is, however, a lack of specification as to which extent consideration and initiating structure is best mixed to reach the optimal leadership in different situations (Fleishman & Harris, 1962).

**Context-oriented models**

Fiedler’s leadership style

Fiedler (1967) does not only discuss the leader’s personal traits, but also how the situation influences good leadership. He states that leadership is dominated by one leadership style, which is based on the leader’s personality. To be an effective leader, there must be some kind of influence process. To achieve influence, a leader’s personal traits are not enough. A relationship between the leader and the subordinates is necessary, resulting in power and authority. Fiedler developed a method that broadly determines a leader’s basic leadership style. The differences between the different leadership styles depend mainly on how focussed the leader is on dealing with the task him- or herself and how engaged he or she is in having good relations with the employees. By mapping the leader’s attitudes towards his or her employees, Fiedler (1967; 1970) assumed that it is possible to decide which basic leadership style the leader has. He then combines this leadership style with three central dimensions of the situation which are of value to the leader’s possibility to influence his or her employees.

1. The first dimension is about the relation between the leader and the employees. This dimension mirrors to what extent the leader is accepted by his or her employees and what support and loyalty the leader gets from them.

2. The second dimension concerns power of the position. This dimension includes the formal power the leader has on the basis of his or her position in the organization, and to which extent the leader can influence with rewards and sanctions.

3. The structure of the task is the third dimension and is about to which extent the goals are clear for the employees. It is also about how possible it is to judge if the result is good or bad, the nature of the procedures to
solve the task and if there is more than one acceptable solution.

According to Fiedler, the situation is favourable if the leader is generally accepted by his or her subordinates, the atmosphere is good, and tasks are structured together with the leader’s legitimate authority.

Situational leadership
A leadership model presented by Hersey, Blanchard and Johnson (1969/2001) is a development from the Ohio School but focusses on the situation. Instead of initiating structure they use the definition task-oriented leadership and instead of consideration they use the term relations-oriented leadership. They highlight different conditions in the situation that can affect the leadership, for example higher leaders, organizations, actors in the environment, and time pressure. The most important factor in the situation (Hersey et al., 1969/2001) is the employees’ preparedness or readiness. This readiness includes the subordinates’ skills, motivation and personal maturity. By considering the subordinates’ readiness, the leader can judge what kind of leadership behaviour is most appropriate in the situation. For example, if the subordinate is unskilled or insecure the leader ought to control more firmly, while a more skilled and secure subordinate with greater readiness needs less control and more consideration from the leader.

Several later studies have their basis in this theory. The results of these studies are, however, that the situation-oriented leadership models, including Fiedler’s, have only limited support (Bass, 1997). The strongest criticism has been focussed on the fact that very few working groups are so homogeneous that the same leadership style suits all the employees, and that there are few leaders who are so flexible that they can adopt their behaviour to every individual employee, in every thinkable situation. This has, for instance, the consequence that the more personality-oriented research has come forward again.

Transformational and authentic leadership models
From 1980 and onwards, the leadership research, especially in the field of psychology, changes focus again to personal traits and charisma, and theories of transformational and visionary authentic leadership was developed.
Transformational leadership

In 1978, Burns (Burns, 1978) introduced the concept of transactional and transformational leadership. Transactional leadership could also be called an instrumental or a “carrot or stick” leadership. Thus, transactional leadership can be viewed as focusing on the self-interests of both the leader and the subordinates (Bass, 1997; 1998; 1999). A review of the literature shows that sometimes three components are presented and sometimes they are condensed into two components. In the following, all three will be briefly presented. The components are:

1. **Contingent reward.** This component is characterized by the way that the leader gives the subordinates contingent rewards for their efforts. This kind of leadership can be seen as quite effective when the leader gets the subordinate to achieve the organizational goals.

2. **Active management by exception.** This is broadly about the leader taking an active part in intervening with the subordinates or employees so they do not fail to meet the standards.

3. **Passive management by exception.** This component is about passive leadership that waits until the subordinates or employees fail in their efforts and make mistakes. This passive or non-leadership can also be labelled passive-avoidant or laissez-faire. Both active management and the passive form seem to be less effective than the contingent rewards style.

Unlike transactional leadership, transformational leadership stresses “...what you can do for your country” (Bass, 1999). In the literature one can find that transformational leadership consists of three to five components. Generally these components are condensed into four, (Bass, 1998) which will also be presented in brief below.

1. **Idealised influence (charisma).** This kind of leader is admired, respected and trusted. This leader shows conviction, emphasizes trust, takes a stand in important and difficult questions and reports the values he or she thinks are the most important. The charismatic leader emphasizes the importance of intentions and engagements and the following ethical consequences. Based on this, the employees want to identify and try to behave like this leader.
2. **Inspirational motivation.** A leader with this type of behaviour expresses an appealing vision of the future, challenges employees to set high standards, is optimistic, enthusiastic and encouraging. He or she also provides meaningful explanations on what to do.

3. **Intellectual stimulation.** A leader with this behaviour questions old assumptions, traditions and beliefs while encouraging others to be very innovative and creative, inter alia, to meet old situations in new ways. This kind of leader also encourages creativity and does not criticize individual mistakes.

4. **Individualized consideration.** This type of leader takes his or her subordinates’ individual needs of developing and growing into consideration, in terms of being a coach or a mentor. This leader sees and treats the employees individually depending on the needs and wishes of each. This leader listens carefully, gives good advice and delegates with a view to developing employees.

The dynamic element in transformational leadership consists of subordinates identifying with the leader, sharing his or her visions and performing above their own individual interests. This effect is called *transformation* (Bass, 1985, 1998). Bass also mention some personal traits which characterize a transformational leader. These traits are: good self-confidence, determination, insight into subordinates’ needs and freedom from internal conflicts.

**Developmental leadership**

Recently, a Swedish leadership model has been developed by Larsson et al. (2003), *developmental leadership*. This model can be seen as a revision of the Bass Transformational Leadership Model. This revision seems to be necessary for three reasons. The first one concerns the concept of charisma, which in the Scandinavian culture could appear to give negative associations to elitism and glorification of a leader. The second revision was a refinement of Bass’s conventional leadership, with its two sub-forms: demands and reward and control. In developmental leadership two facets of the two sub-forms were identified, a more positive and, respectively, a more negative approach. When it comes to demands and rewards, Bass’s (1998) original model called this contingent reward, which means that the subordinates are rewarded if, but only if, they do what the leader expects from them. In Larsson et al.’s (2003) developmental model, this could also
have a more positive side, which they labelled seek agreements and which explains a more interactive approach between the subordinates and the leader. When it comes to control, Bass called this category active management-by-exception which could lead to over-control, while Larsson et al. (2003) called the more positive approach take necessary measures, which can imply a more constructive approach. The third revision is that leadership behaviours are placed within the framework of a general interactional model (Endler & Magnusson, 1976), i.e. that the leader’s behaviour depends on an interaction between the character of the leader and his or her environment.

According to the model, developmental leadership consists of three main areas that interact with each other: leader characteristic, environmental characteristic and leadership style. The following is a brief summary of the major concepts of leadership styles.

1) Developmental leadership
   a) Exemplary Model - this involves the leader’s value base, being a good example and taking responsibility.
   b) Individualized Consideration - this involves supporting and confronting co-workers.
   c) Inspiration and Motivation - this could be seen as quite similar to Bass’s factor intellectual stimulation. This includes two facets: promote participation, and promoting creativity among the co-workers.

2) Conventional leadership
   a) Involves demand and reward, which could be compared with Bass’s (1998) contingent reward. These behaviours involve two parts: a more positive “seek agreements”, and a more negative called “carrot and stick”.
   b) The last one is control. This includes the leader taking necessary responsibility for the goals, while the more negative aspect is that the leader is over-controlling.

3) Non-leadership, or in Bass’s (1998) words, “passive management-by-exception” and “non-leadership.”

To increase e.g. performance and work satisfaction within the organization, the leader should use more of the developmental leadership behaviours and less of the other types of leadership behaviours mentioned above (Bass, 1999). Besides this style, consideration must also be taken of
the environment or context in which the organization appears. Especially during stressful operations, it may sometimes be necessary for a leader to behave in a more controlling way. The strength of this model is the focus on the leadership characteristics. One weakness, on the other hand, is the lack of more specific environmental characteristics. The focus is on the leader and on how the leadership behaviour can be used to interact with the employees. This model has been used by the Swedish Armed Forces since 2003, and applications of the leadership model have also been taken up in several official and private organizations.

One recent study, however, that focuses on contextual influences involving both military and ambulance personnel, was conducted by Larsson and Hyllengren (in press). They have modelled contextual conditions that influence leadership into profiles, group, organizational and environmental levels. These profiles show for example that the demands on a leader differ depending upon the hierarchical level of the leader. One example is that high-level or more strategic leaders seem to be more influenced by factors such as the media and legal aspects, as well as vertical and spatial organizational differentiation. Even if this study has shed some light on how the context could influence leaders, still more research would be desirable, especially in a variety of organizational contexts.

Authentic leadership
As society changes, so do the demands and the expectations on a successful leader (Avolio & Walumbwa, 2006). The convergence of challenges for a leader today, such as being a public figure in combination with the financial demands, call for the leader to stay true and requires a genuine leadership (Avolio & Gardner, 2005). The interest in studying authentic leadership is primarily based on these leaders achieving great success, not just within their own organizations but also from a greater societal perspective (George, 2003; Avolio, Gardner, Walumbwa, Luthans, & May, 2004).

This is however, not a new way of thinking. Even the ancient Greeks spoke of authenticity when they urged to “be true to oneself” (Harter, 2002). Although this way of attempting to explain leadership is not new, there is resurgent interest in authentic leadership and what it consists of (Avolio et al., 2004; Gardner and Schermerhorn, 2004; Avolio and Luthans, 2006; Avolio and Walumbwa, 2006; George and Sims, 2007).

To be an authentic leader means, however, more than just being true to oneself. Primarily an authentic leader has to achieve authenticity (Gardner, Avolio, Luthans, May & Walumbwa, 2005). Kernis (2003) identified four
components of authenticity: awareness, unbiased processing, action and relation. Gardner et al. (2005) have incorporated these components in a model of authentic leader and follower development.

According to this model, there are two fundamental components that contribute to the development of an authentic leader. The first is the leader’s self-awareness, or personal insight. This component consists of four sub-dimensions: values, identity, emotions and motives/goals. Through introspective self-reflection of these four dimensions, authentic leaders can increase their understanding of themselves. The second core component is self-regulation. This component also consists of four sub-dimensions. (a) Internalized regulation refers to a regulatory system of the leader’s inner-core self, instead of external factors. (b) Balanced processing of information refers to the leader remaining objective, whether external information is positive or negative, in order to increase his or her inner self-development. (c) Relational transparency refers to the leader being open, honest and trustful in relations. (d) Authentic behaviour means that the leader’s actions are built on his or her self-awareness, instead of external factors. By actively and continuously being a positive role model, an authentic leader lays the foundations for having authentic followers. An effect of this can, in turn, lead to favourable outcomes on an individual as well as organizational level (Avolio & Gardner, 2005).

One definition of authentic leadership that takes into account the underlying dimensions of authentic leadership is Walumbwa, Avolio, Gardner, Wernsing & Peterson (2008):

...as a pattern of leader behavior that draws upon and promotes both positive psychological capacities and a positive ethical climate, to foster greater self-awareness, an internalized moral perspective, balanced processing of information, and relational transparence on the part of leaders working with followers, fostering positive self-development. (Walumbwa et al., 2008, p. 94).

The authentic leadership theory can be seen as a “root construct” (Avolio et al., 2004; Gardner et al., 2005; Avolio & Gardner, 2005) as this type of leadership can be considered to be more generic than others. This means that authentic leadership can serve as a basis for other types of leadership. Examples of this could be Transformational leadership and Developmental leadership (see above). These two theories focus on encouragement, inspiration, and being a role model for others, i.e. being an authentic leader to reach certain visions and goals. But, on the other hand, if the leader is using his or her power or position to manipulate employees to achieve these visions and goals, then the leader is not an authentic leader (Avolio
Indirect leadership

Much research has been done on leadership in a direct form, i.e. “face-to-face” leadership. Far fewer studies have been conducted on more indirect leadership, even though this kind of leadership is quite common (Larsson, Haerem, Sjöberg, Alvinius & Bakken, 2007). Hersey et al., (1969/2001) point at the different kinds of demands encountered by leaders in different hierarchical levels. At an intermediate level, for example, the leader has direct contact with his or her subordinate managers and indirect contact with subordinates below these managers. This is necessary, when it is difficult to build and sustain personal relationships with hundreds, and sometimes thousands of individuals. Therefore the contact with these subordinates is primarily through the leaders’ subordinate managers and the indirect leadership is thus characterized by being a manager of managers. At this hierarchical level the ability to overview and abstraction ability is of particular concern. However, it is not possible for a leader to have extensive, detailed knowledge of all the activities of the organization. Another characteristic of leaders is the requirement to deal with different time scales (Björkman, 1999). This means that leaders at one moment must make quick decisions here and now, and in the next moment must think far into the future. The demands on the middle manager are to be able to master the cross pressure, that is to be able to balance both directives from top to bottom requirements (see e.g. Mintzberg, 1980; Björkman, 1999; Watson, 2001; Johnsen, 2002).

Some studies have also been made regarding desirable intellectual and personal characteristics of leaders at different hierarchical levels (Jaques 1976; Keegan, 1982; Jacobs & Jaques, 1991). One model based on Jaques’ theory of stratified system (1976) is Hunt’s (1991) multilevel leadership model. This model unites these issues into a comprehensive framework, which could be valuable for studies of ordinary leadership as well as indirect leadership.

Another interesting research area for indirect leadership is distributed decision-making. This kind of decision-making seems to emerge during dynamic situations through, for instance, information overload (Artman, 1999). Leaders only have access to a reduced mental model of the problem at hand. This leads to different actors, who have different kinds of knowledge, having to communicate and create a sensemaking of the situation together (Brehmer, 1991; Weick, 1995). Nevertheless, despite its intuitive appeal for dynamic settings such as leadership in a military, rescue
services or police context, this research has been criticized for being too cognitively oriented. Connections to motivational and emotional processes are, however, weak, as well as are different social and cultural contextual aspects (Larsson, 2005).

Two principal forms of indirect leadership
Research related to indirect leadership often focuses on functional requirements of indirect leadership related to organizational levels and also to desirable individual characteristics of these leaders. Less attention is paid to how indirect leadership is achieved. Yammarino (1994) however, has analyzed two principle forms of indirect leadership. One form is the cascade model, where leadership is mediated and filtered through subordinated managers. The second is called the by-pass model, which means that a higher-level manager makes direct contact with an employee two or several levels below. This contact is made without involving the intervening manager(s). Yammarino also distinguishes between indirect leadership mediated by individuals and indirect leadership mediated by mass media. He also illustrates how indirect leadership can be exercised relating to transformational and transactional leadership models (Bass, 1985; 1998).

Summary
Leadership can be seen as a complex phenomenon. The research focus of leadership has changed over the years, and will probably continue to do so. New perspectives and new concepts continue to emerge over time. Leadership seems to involve several aspects such as personal traits, leadership behaviour, context and hierarchical level. Other influencing factors are, for example, organizational culture, social climate and the spirit of the time.

Leaders in military professions and rescue services are highly sensitive to the context in which they act (Avolio & Gardner, 2005; Koldits, 2007). They often work in highly dangerous environments and because of this, leadership can be critical to life and death. For this reason in these organizations it is necessary to select leaders with sufficient basic personal characteristics, such as personal traits, for these kinds of jobs. Drawing on the existing research it appears to be favourable to select leaders that are transformative, developmental or authentic, so that mutual trust can develop between the leader and the subordinates. These kinds of leadership may provide a good basis for success because of the personal identification with the subordinates and also the identification they create with the
organization (Kark & Shamir, 2002). This may lead to a better and more effective operation outcome.

During an operation, it is often necessary to make quick decisions here and now, and often under great time pressure. With regard to this, indirect leadership may come to play a crucial role. A leader may not have time to maintain detailed control of all events but must have faith that his or her subordinates will do what is expected of them. The leader cannot be everywhere, but must rely on subordinates knowing the set directions and goals.

An attempt has been made in this theoretical overview to present the most influential leadership models when viewed from a psychological perspective. All of the models, including the most recent ones, have their pro’s and con’s. Following the selection of research questions in this thesis, two areas were regarded as desirable to explore further. One concerns the lack of studies which deal with leadership at higher hierarchical levels in emergency response organizations like the military and the rescue service, since most research on indirect leadership has been done on top-level management such as presidents of the United States or global companies (Yammarino, 1994). In particular, there appears to be a lack of knowledge regarding how indirect leadership can be performed in these types of organizations, i.e. what a leader actually does to influence subordinates two or more hierarchical levels down. The second leadership area where research appears to be insufficient, concerns leading emergency response organizations in complex and highly stressful conditions. A summary of relevant research related to this will be further developed in the next section.
Stress

Situations that could be perceived as strongly stressful for most people are often everyday working life for military and rescue personnel. They are trained and prepared for these kinds of situations, and handle them professionally and without too much stress. But sometimes an operation puts other and new demands on the leader.

Military leaders must handle a variety of events, from peacekeeping operations to hostile fire which could involve life-threatening situations, for themselves as well as for their subordinates (Kavanagh, 2005). This could occur in all kinds of operations. Leading under stress is both central and unique to the military profession (Larsson et al., 2007).

Fredholm (in Fredholm & Göransson, 2010, p. 27-28), describes seven different categories that emergency response management must take into consideration when handling complex accidents. This category system could also be of interest when it comes to leadership. This ranking is about an increase of complexity in rescue accidents. Following this will be a brief summary of the first (1) and least complex type of accident and the last (7) and most complex type of accident.

(1) Emergency response management of operations during emergencies of an everyday nature. These kinds of accidents have the character of being frequent and rather limited. They are relatively easy to overview and recognize. Examples include car and apartment fires. For these kinds of operations one or perhaps a couple of units from the organization are needed.

(7) Emergency response management during complex emergencies with direct serious consequences for two or more countries. These kinds of accidents affect not just one, but two or more countries. The sinking of M/S Estonia and the 2004 Boxing Day tsunami in Southeast Asia are examples of this category.

Rescue services leaders and their subordinates are also exposed to stress, both during rescue operations and in their role as “helpers”, and they may be hidden victims because of this Raphael (1986). Personnel from rescue services are at risk of being exposed to severe stress, life-threatening events and physically demanding activities (Fullerton, Ursano, McCarroll & Wright, 1992; LeBlance, Regehr, Jelley & Barath, 2008).

Tough conditions, such as long working hours and the need to constantly be prepared for new and challenging situations seem to be
characteristics of military and rescue leaders. Being a leader in these organizations means to be continuously at risk of being exposed to strain situations and facing stress, both one’s own but also one’s colleagues’ as well as the victims’. It is significant that military and rescue leaders keep their own stress levels in check as well as their subordinates’, so they are able to perform well during an operation. This is especially important to reduce human suffering and victim numbers, as well as financial and cultural loss as a result of an accident or catastrophe (Kivimäki & Lusa, 1994).

**Stressors**

Examples of stressors that military leaders and personnel are exposed to, apart from confronting enemies, could include living under difficult conditions, lack of sleep, risk of disease and boredom (Kavanagh, 2005; Hancock, 2009). Other common stressors could be: geographical isolation, culture shock, as well as social stressor e.g. knowing that they must be away from family and friends for long periods and the imminent risk of never coming home (see e.g. Eriksson, Kemp, Gorsuch, Hoke & Foy, 2001; McFarlane, 2004; Eade, 2006). The stress that follows this may have a major impact on their decision-making, performance and leadership.

Research on firefighters has shown several working stressors such as work demand, characteristics of the working role, policies, managers’ stress, employees’ stress and inadequate resources to handle the work effectively (Beaton & Murphy, 1993). The National Commission on Fire Prevention and Control in the United States, declared that firefighters are the most vulnerable and have the most dangerous work in the country, as they rank highest when it comes to work-related injuries and fifth when it comes to death at work (Hildebrand, 1984; IAFF, 1997). Repeated exposure to trauma could increase the risk of firefighters developing post-traumatic stress symptoms. This means that leaders within the rescue services need to consider both their own stress levels as well as colleagues’, victims’ and public stress levels - often during intense media coverage (Fullerton et al., 1992; Beaton & Murphy, 1993).

**The concept of stress**

Stress is a complex concept which is influenced by different components at the same time, and is also a highly individual experience. Earlier experience, physical and mental health, education and above all, control, have emerged as important components in increasing performance and reducing negative effects during stress. The selection of these leaders should therefore focus on a stable, positive and open personality in combination
with a certain degree of adventureism to willingly be exposed to the strain that this profession could bring.

As stress is a common part of the working life of leaders within both the military and rescue services, the next section will examine some of the most commonly used theories in the research relation to stress. The section starts with a brief presentation of a historical perspective on stress. Following that will be a presentation of different types of appraisals. After that additional attention will be given to individual factors and coping.

A historical perspective
The concept of stress can be traced back to the 14th century. In those early days the word stress was not used, but instead words like strain, difficulties, adversities or affliction. Not until the 19th century was the concept of stress studied more systematically (Lazarus & Folkman, 1984).

The concept of homeostasis, which describes how an organism strives towards balance, was introduced by the researcher Claud Bernard in the middle of the 20th century (McEwen & Lasley, 2003). He can be said to be the one who laid the foundations of research into stress. However, the researcher who coined the term stress was Walter Cannon. In 1914 he studied how stress could threaten organisms striving for homeostasis and survival. Many stress and health researchers consider that it is Cannon who should be known as “the father of the field” (McEwen & Lasley, 2003, p. 11). But it was Selye who put the concept of stress on the map. In 1936 he demonstrated that the body has a built-in defence system which follows a certain, general pattern towards all kinds of harmful stimuli. He called this system General Adaptive Syndrome (GAS). This syndrome includes three stages of stress, i.e. one alarm reaction, one resistance stage and finally, one fatigue stage (McEwen & Lasley, 2003).

Selye saw stress as physical reactions to threats from the environment, and not as a threat in itself. Selye continued his work to develop the GAS concept, and during the 1950s he launched the concept of stress in the Annual Report of Stress (Lazarus & Folkman, 1984). By then he had come to call the states of reactions triggered by strain “stress”, and the strains he called “stressors”. Selye divides stress into positive (eustress) and negative (distress) and meant that positive stress is associated with positive energy, vigour and stimuli which increase health and well-being. Negative stress is associated with anger and aggression and has a harmful effect on health (Selye, 1974). However this theory has weak empirical support, and there are indications that even positive stress can have negative consequences on health and well-being, especially if it is prolonged (Frankenhauser & Ödman, 1987).
Performance during stress

Stress occurs in every workplace and may affect performance as well as well-being (Williamson, 1994). It has been shown that a mild degree of stress improves an individual’s performance, while a higher amount of stress has the opposite effect, i.e. leads to impaired performance (see e.g. Yerkes & Dodson, 1908; Welford, 1965).

One common way to describe the relation between performance and stress is through Yerkes and Dodson’s (1908) inverted U-curve. According to this model, every individual seems to have their “good enough stress-curve”. Figure 1 below is based on Yerkes and Dodson’s principle from 1908, which illustrates the connection between performance and level of arousal.

![Performance vs Arousal Graph](image)

*Figure 1. The connection between performance and arousal.*

This stress-curve seems to be affected by several conditions and can change over time, i.e. depending on the individual’s current state. One example of an important condition for the current state is recovery and sleep. Åkerstedt and Kecklund (2005) have studied how lack of sleep can make the effects of strain or stress worse. But they have also seen that stress, at the same time, can increase the need for sleep and make the individual sleep even better. Their study shows how performance ability is halved after 24 hours without sleep, and that the performance level is at its lowest after 48 hours without sleep. Their results also show that individuals who like their work and have a good social climate at their workplace also suffer less sleep disturbance.
This curve has, however, met great scepticism (see e.g. Hancock, 2009). It can also be questioned whether Yerkes and Dodson really measured stress or just electric shocks. Other criticism of this curve is that the relation between arousal and performance cannot be described by a curve, but more as a linear relation (Broadbent & Broadbent, 1988; Matthews, Davies & Lees, 1990). Matthews et al., (1990) instead suggest that performance is connected with the character of the task, i.e. if the task is quite easy, a higher amount of arousal is better, while if the task is quite complicated a lower level of arousal is preferable. Also, other and different patterns have been found when it comes to this relation (see e.g. Sullivan & Bhagat, 1992). Some of the relations have been shown to be skewed versions of the inverted U-curve, others are non-inverted U-curves, and some of them are linear. Even though researchers do not agree on this relationship between performance and stress, the inverted U-curve is still one common way of explaining the connection between the two.

Humphreys and Revelle (1984) suggest that cognitive performance could be understood by general principles or laws like Yerkes and Dodson’s in a combination with personality and individual differences. They suggest three areas of personality that have shown to be of importance: introversion - extraversion, achievement motivation and anxiety. For example, high levels of introversion, motivation and anxiety imply better performance in some cases, but worse in others. One reason for this could be that introvert individuals often are more aroused than extraverts (see e.g. Eysenck, 1967). Other reasons could be that high achievers perform better during complex tasks at lower levels of arousal than low achievers, (Humphreys and Revelle, 1984) and so reach their peak earlier. If the level of anxiety is sufficient, the individual will perform better. But if the anxiety level is too high, this will reduce performance.

**Individual interpretation**

Different people seem to become stressed for different reasons. How is it that some people will experience feelings of challenge where others will experience threats and stress? According to Lazarus and Folkman (1984) stress can be seen as a relation between the individual and his or her environment. They argue that stress is a subjective experience which is based on the individual appraisal of a potential threat from the environment.

This appraisal is based on the individual’s previous experiences, competences, goals and expectations. If the individual appraises the situation as a threat, a stress reaction arises. This appraisal is often difficult to observe empirically, especially when the individual may be unconscious.
of this. This appraisal process is crucial for how the individual will react in a situation. It is possible, however, from a specific feeling or emotion to derive the special appraisal perception (Lazarus & Folkman, 1984).

Different types of appraisals
Lazarus and Folkman (1984) divided subjective and individual appraisal into two parts, primary and secondary appraisal. Primary appraisal concerns questions like “Is this a threat or a possibility, now and in the future, and if so in what way?” The secondary appraisal on the other hand is instead focussed on “What can be done?” The terminology of primary and secondary appraisal are, however, not entirely accurate. The reason for this is that secondary appraisal could be interpreted before primary, and because of this, it could also be more important than primary. Lazarus and Folkman (1984) further developed this concept with a third kind of cognitive appraisal, which in addition to primary and secondary, also includes a third element: reappraisal.

In the primary interpretation, an assessment of the threat concerns if it is irrelevant, favourable/positive or stressful. If the threat or situation is considered stressful, it can in turn be regarded as damage or loss (that the damage has already occurred), threat (risk of harm in the future) or as a challenge (to influence or develop). In the secondary interpretation, the individual makes an assessment of his or her ability to handle the situation. In the third interpretation, that reinterpretation (reappraisal) is a new interpretation based on new information which comes from the environment and/or the individual. This reappraisal is different from the first interpretation only in the manner that it is derived from an earlier interpretation.

Lazarus continued his work to develop the concept appraisal from its focus on psychological stress to instead focus on emotions (Lazarus, 1991). As a result of this further development, primary appraisal now includes three parts: goal relevance, goal congruence/goal incongruence and finally ego involvement. Goal relevance refers to how an event or situation collides with personal goal or interests. If there is no goal relevance, there cannot be any emotion. But if there is, another emotion occurs depending on the outcome of the event or the situation. Goal incongruence refers to the extent to which an event or a situation matches, or conversely does not match, the individual’s goal. If an event or a situation prevents an individual goal, there will be incongruence. If, on the other hand, the event or the situation facilitates personal goals, then goal congruence will occur. Goal congruence leads to positive emotions while goal incongruence leads to negative emotions. The specific emotion also depends on the secondary
appraisal, i.e. what can be done. Type of ego-involvement refers to different aspects of ego-identify or personal commitments. Examples of ego-involvement are self-confidence, moral values, other people and their well-being and life goals.

Secondary appraisal occurs when the individual makes a new appraisal after the primary, depending on the threat and the consequences of that threat. The purpose of this is to give the individual a possibility to adopt or change strategy to a more adequate behaviour, in order to minimize the effect of the threat. This appraisal is individual and is nearly always connected with the individual’s earlier experiences of similar threats. The way in which the individual handles the situation depends on what kinds of coping strategies he or she has available. Just like primary appraisal, secondary appraisal also consists of three subcomponents (Lazarus, 1991): blame or credit (either external or internal), coping potential and expectations for the future. Blame or credit is connected with whether the event or situation had been possible to influence in one way or another. Coping potential is nearly always connected with if and how the individual can handle and manage the demands of the event or situation. The expectations for the future are connected with whether psychological changes will lead to something better or worse, i.e. to be more or less goal congruent.

Handling stress
Some people experience a difficult or new situation as a challenge, while for others the same situation may be rather stressful and difficult to handle. This difference may be a result of how the individual copes with the situation, as well as what kinds of strategy or preparedness the individual possesses. It may also depend on the individual’s personality, as will be presented further below.

Problem- and emotion-focussed strategies
The different coping strategies available to the individual depend for instance on education, experience, relations and intellectual ability. Lazarus and Folkman (1984) differentiate between problem- and emotion-focussed coping strategies. According to Lazarus and Folkman, examples of these kinds of strategies are “generating alternative solutions, weighting the alternatives in terms of their costs and benefits, choosing among them, and acting” (p. 152). The reason for using problem-focussed strategies is that the individual through his or her own action and behaviour can solve or improve the threatening situation. The emotion strategy means that an individual processes and handles emotions and reactions caused by the
situation. Examples of emotion-focussed strategies, according to Lazarus and Folkman (1984), are “avoidance, minimization, distancing, selective attention, positive comparisons, and wresting positive value from negative events” (p. 150). The problem-focussed strategies are the most effective ones if the individual judges that there are possibilities to influence the situation, while the emotional strategies are preferable when the individual appraises that the situations have to be tolerated and accepted as they are.

Individual factors and coping

**Personality**
There is research that shows the connection between personalities, coping and stress (see e.g. Welford, 1965; Penley & Tomaka, 2002). Research by Penley and Tomaka (2002) shows how the cognitive appraisal process, for example, can predict how an individual reacts to stress. They have, for example, seen that individuals who score highly on neuroticism (N) can be associated with a low degree of coping ability and a high degree of negative emotions like anxiety and fear. The results of this study also point towards this personality type experiencing decreased performance during stress. The personal trait extraversion (E) can be associated with emotions of joy and pride and that individuals also experience increased performance during stress. Individuals with the personal trait openness (O) seem to have active coping strategies and are also pleased with how they solve tasks during stress. Individuals who score highly on agreeableness (A), showed connections with emotionally focussed coping strategies, while they searched for social support and showed passivity during stress. Finally, individuals who scored high on consciousness (C) saw themselves as competent and sufficiently capable to meet demands during a stressful situation. The results illustrate that this personality type showed self-discipline and goal consciousness and that they were using problem-focussed coping strategies.

**Individual beliefs**
Eriksen and Ursin (2005) argue that coping or mastering of stress is not only about solving a situation, but also about the individual’s belief in his or her own ability to handle the situation. The strategy can either be passive or active depending on the situation and the personality, but the individual’s belief seems to be most important to the individual’s health. This belief seems to weaken the stress reaction and thereby also reduce the risk of illness. This leads to a positive expectation for an individual that his or her strategies are effective and functional. This in turns leads to a feeling
of control over the situation. Karasek and Theorell’s theory about Healthy Work (1990) describes how individuals who are under great pressure or demands and who experience low control over a situation are at risk of developing illness.

Control is also essential for Bandura (1997). His term self-efficacy means that an individual has assumptions of his or her own ability to organize, perform and focus on the task. Self-efficacy influences, for example, what kind of behaviour the individual chooses to use together with thinking patterns, resilience and experiences of stress. Good self-efficacy facilitates performance in different kinds of working environments.

**Internal and external locus of control**
As mentioned above, stress can be seen as a response when an individual risks losing, or fights to keep, control of a situation (Theorell, 2005). When an individual has lost control of a situation, there is no longer any interest in fighting for it, and instead the individual becomes passive to save his or her energy. The feeling of control is nearly always connected with the individual’s personal coping strategy and interaction with the environment. It has been shown in twin studies that locus of control is determined by the experiences and the environment in which the individual is (Theorell, 2005). With external locus of control, the individual believes that he or she cannot influence the problem or situation, while internal locus of control means the opposite. When it comes to treating individuals as well as in education, focus should therefore be on the individual internal locus of control. The purpose is to increase the individual’s possibilities to influence and consequently to handle difficult situations.

**Sense of coherence and hardiness**
It has been shown that there are several ingredients that influence the individual’s experience of stress and performance. Antonovsky (1987) connects these ingredients in *sense of coherence* (SOC). SOC includes three different components: comprehensibility, manageability and meaningfulness. When it comes to severe stress, Antonovsky holds that no matter how terrible the situation is, we still have a chance of surviving and growing with it, if we can experience the possibility to control and predict and therefore find meaning in the situation. There are several theories that illustrate this. Kobasa (Kobasa, 1979; Kobasa, Maddi & Kahn, 1982) states that individuals who experience a high degree of stress but maintain their health differ in personality from those who feel the opposite. This phenomenon is called *hardiness*. An individual with a high degree of
hardiness is characterized by a feeling of control over a situation, enabling them to deal with the situation in a more appropriate way, which leads to stronger health. Hardiness includes the following three components: engagement, control and challenge. A difference between SOC and hardiness is that SOC is based on the individual’s search for stability, while hardiness means that individuals seek change in order to develop (Antonovsky, 1987).

Summary
One way to understand the stressors encountered by leaders of emergency response organizations is to see them in relation to performance. Despite the criticism against Yerkes and Dodson’s U-curve it is still useful in understanding the relationship between performance and arousal.

Stress can also be seen as an imbalance within the individual, i.e. that the imbalance threatens the individual’s striving for homeostasis and survival (McEwen & Lasley, 2003). How people experience stress differs, however, from person to person. Some people tend to experience new situations as a challenge while others experience threatening stress reactions. One explanation for this can be that the appraisal process is individual and that the truth lies in the eyes of the beholder. Much seems to be due to the individual’s belief of whether is possible to take control of the situation. This fits well with Lazarus and Folkman’s (1984) theory of primary, secondary and reappraisal as well as Antonovsky’s (1987) sense of coherence.

The way an individual handle stress depends on their coping strategies, which in turn depend on education and experience, for example. Also personal traits influence the available coping strategies and the individual’s way of handling stress, where some traits are more favourable than others. Sensation seeking may be one reason for applying to work in organizations such as the military force or the rescue services. This personal trait can have negative consequences, i.e. when leaders expose themselves and others to unwanted risks. On the other hand, it seems these individuals recover faster than those with a lower degree of sensational seeking traits.

Summing up, despite the vast amount of existing research on stress from a psychological perspective, there appears to be a gap when it comes to understand leadership in complex and/or stressful rescue operations.
Methodological considerations

Just as the focus on leadership research has shifted over the years from the identification of personal qualities to a more developmental, visionary and authentic leadership, so has the use of methods of studying leadership (Avolio, Sosik, Jung & Berson, 2003). From more quantitative survey methods with a focus on the leader as an individual, to more qualitative, with a focus on leadership behaviours for example. But no matter which method is being used, they all have their strengths and weaknesses.

The following section contains an overview of two commonly used research methods, qualitative and quantitative. Following this will be a presentation of specific considerations of studying leadership in stressful situations. After that comes a brief overview of using multiple methods, or triangulation, before this section concludes with a summary and a presentation of the present approach of this thesis.

Qualitative methods

The use of qualitative research methods within the field of leadership is increasing and one reason for this is probably the fact that qualitative methods reflect the need to see leadership as a relationship (Popper, 2002). The interest in qualitative methods has also led to a growth in the numbers of qualitative methods, with several sub-paradigms and techniques. One of the most commonly used method in leadership research is the constant comparison or grounded theory method. Following this, a short summary of the method will be presented.

Grounded Theory

Grounded theory (GT) is a commonly used qualitative method in leadership research. The roots of this theory lie in the symbolic interaction, which in turn is derived from pragmatists such as James, Dewey, Cooley and Mead (Hammersley, 1989). It was Glaser and Strauss (1967) who first introduced the constant comparative method of GT. The assumption initially was that there was one objective external reality that could be discovered and recorded (Charmaz, 2003). With the aim of explaining data, this method generates a theoretical framework. This method can be said to be more inductive than deductive, as the researcher makes his or her hypotheses from data instead of testing hypotheses with data. In GT, constant comparisons of data with data, and of categories with categories, will make them emerge (Glaser, 1992).

After the original publication of Glaser and Strauss in 1967, the theoretical foundations underpinning the method have more recently been
reformulated from a more post-positivistic paradigm to a more social-constructivist one (Strauss & Corbin, 1998). The controversy between these two directions concerns the fact that the constructivists believe that the post-positivists place themselves outside the experience of those they are studying. Charmaz (2000) argues that the social-constructive direction instead promotes the development of qualitative traditions by studying the experiences of those who experience them. Glaser (1992) criticizes this reformulation of GT and argues that there exists a risk of forcing data and analysis through their hypothesis and methodological techniques. Instead he states that “Categories emerge upon comparisons and properties emerge upon more comparison. And that is all there is to it” (Glaser, 1992, p. 43).

One criticism of qualitative research methods is the criteria of trustworthiness or validity and reliability (Kirk & Miller, 1986; Kvale, 1997; Charmaz, 2003). The criticism mainly consists of lack of representativeness and generalizability resulting from, for example, small samples and the subjectivity of the researcher (Kuhn, 1970; Kvale, 1995; Szklarski, 2002). Replication and inter-subjectivity are however one way to increase the validity in qualitative research methods (Borg & Gall, 1989).

One great advantage of qualitative research methods is that the researcher gathers a great deal of information on a single occasion. When using interviews, the researcher gets more information than just the verbal interview responses, for example facial and emotional expressions could be observed. The disadvantage of the qualitative interview is that it requires experienced researchers. If the interviewer is inexperienced, he or she might not be able to use the qualitative method with the ability to ask the “right” follow-up questions. An experienced interviewer on the other hand, can be caught in his or her hypothesis and thus miss relevant answers.

**Quantitative methods**

The quantitative method represents reliability, representation, reproducibility, accumulation, verifiability and access to a clearly defined rules method (Starrin, Larsson, Dahlgren & Styrborn, 1991). These kinds of research methods enable the researcher to study the phenomenon with a large sample of informants. This means that the strength of this kind of method is, provided the selection of informants is representative, that the results have good generalizability. When it comes to the phenomenon leadership, the quantitative method could, for example, be used to find out how often a leader uses a specific kind of behaviour.

A common quantitative method is to use questionnaires. A great advantage of questionnaires is that it is quite easy to get a lot of information in
a relatively simple and cost-effective way. A disadvantage is that these questionnaires can be incompletely filled in and that it can be difficult to know if the responses are honest. Another disadvantage is that the researcher has no way of following up the answers with follow-up questions.

**Specific considerations of studying leadership in stressful situations**

Studying leadership during stressful operations has its methodological challenges. One challenge can be that the researchers studying the phenomenon are not able to be present when the operation or the stressful event takes place (Wallenius, 2001). This is one of the reasons why retrospective study in this field is commonly used. There are, however, some aspects of conducting retrospective studies that can be problematic. An example is the time factor. Often some time has passed since the event happened, which may influence the leader’s appraisal and memory of what actually happened. Wallenius (2001) states that this is one of the reasons why case studies are more common in “research in the field of real life danger situations” (p. 14), and that because of this, there are difficulties in replicating these kinds of studies. Yet it has been shown that there is a difference between remembering emotional events and neutral ones (Christianson, 1992). Through, for example, higher emotional arousal in stressful events, detailed information can often be better retained than during more neutral events.

Due to the limitations of both quantitative and qualitative research methods, there is a growing interest in using multiple methods in research (see e.g. Lowe & Gardner, 2000; Bryman, 2006; Gardner et al., 2010). Below is a brief summary of integrative multiple methods.

**Multiple methods**

One label for using both quantitative and qualitative research method is “triangulation.” Jick (1979) advocates this approach as a way to increase validity as it mixes and integrates different methods and data. He also argues that triangulation is a way to get a more “holistic” picture of the studied aspect, and that it can provide variance which could not have been measured by a single method. But the use of multiple methods has its weaknesses. Bryman (2006) argues that multi-strategy research is not always designed and performed in a “thought through” way (p. 110). His criticism is that few studies have been designed properly, i.e. that both the
quantitative and qualitative research lacked different and specific research questions.

A review of the literature reveals that the lack of leadership research especially concerns the influences of contextual aspects (Lowe & Gardner, 2000; Avolio et al., 2003). Though leadership is often defined as including some kinds of relation with other people, and this in a specific context (Bryman, Stephens & Campo, 1996), it is essential for leadership researchers to take account of these aspects as well (Lowe & Gardner, 2000). One way to reduce this lack of knowledge is to use multiple methods when studying leadership. The advantage of using multiple methods in leadership research is that it could increase understanding of the influences of various aspects, such as the leader, the subordinates, the working group, the whole organization the leader acts in, (Lowe & Gardner, 2000) as well as the context. Yammarino, Dionne, Chun & Dansereau (2005) reviewed early leadership research from a levels-of-analysis perspective. According to them, many leadership researchers do not take inter-level differences in consideration when conducting studies. They identify four different important levels of analysis: the individual, the dyad, the group or team, and the whole collective.

**Summary**

Both qualitative and quantitative methods have their strengths but also their weaknesses. The point is that it is possible, and sometimes even desirable, to combine the two different methods.

When it comes to research in general, and leadership research in particular, both qualitative and quantitative methods can be valuable as they can supplement each other discovering as much as possible about leadership. One advantage of using different and more than one method when studying leadership is to utilize the best of each approach. To get more knowledge about a complex phenomenon like leadership, it appears necessary to use several different research methods to get closer to the big picture.

**The present approach**

This thesis is based on multiple methods where both qualitative and quantitative methods have been used. Papers I and III are based on qualitative research methods, using a GT approach, as data were collected through in-depth interviews. The aim of using qualitative methods in studies I and III was to develop an understanding of the studied phenomenon. This approach aims to generate and suggest categories, properties and hypotheses regarding given problems. No attempt is made
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Both qualitative and quantitative methods have their strengths but also their weaknesses. The point is that it is possible, and sometimes even desirable, to combine the two different methods. When it comes to research in general, and leadership research in particular, both qualitative and quantitative methods can be valuable as they can supplement each other discovering as much as possible about leadership. One advantage of using different and more than one method when studying leadership is to utilize the best of each approach. To get more knowledge about a complex phenomenon like leadership, it appears necessary to use several different research methods to get closer to the big picture.

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An additional reason to combine two methodological approaches in the studies, beside to increase the validity was to manage the complexity in leadership and stress in military and rescue operations. The qualitative method used in this thesis is inspired by the constant comparative method of Grounded Theory (GT), and the more classical sub-direction that Glaser stands for.
Empirical studies

In the following, a summary of the four empirical papers that are included in this thesis will be given.

Paper I: Indirect leadership in a military context: A qualitative study on how to do it

Background

Much research on leadership has been focussed on direct or face-to-face leadership. Fewer studies have focussed on indirect leadership or the influences a leader has on employees not reporting directly to him or her. One exception is Yammarino (1994), who analyzed two principal forms of indirect leadership, where one is known as the “cascade model” and the other one the “by-pass model.” Despite the existing valuable structuring of indirect leadership and Yammarino’s (1994) framework in particular, it is argued that knowledge of the hows of indirect leadership rest on a weak empirical ground. This particularly appears to be so when indirect leadership is viewed from the perspective of different kinds of organizational contexts. In this study, which focusses on the military context, the concepts of risk and safety appear to be particularly relevant (cf. the research on so-called high reliability organizations; Roberts, 1989; La Porte, 1996). Following from this, the conclusion is that more generative research approaches are needed to enhance the understanding of the issue.

Aim

The aim of this study was to develop a theoretical understanding of how indirect leadership is done in a military context.

Method

The method used in this study was an explorative grounded theory (GT) approach (Glaser & Strauss, 1967). According to the guidelines of GT, the selection of the participants as well as the organizations was done with a desire to find informants with as wide a variety of experiences as possible.

Data were collected in personal interviews with 28 participants in a two-step procedure. The first data collection involved in-depth interviews with three high-level managers and three of their employees, working at least two organizational levels below them. These interviews were focussed on general aspects of indirect leadership. Also 15 colonels attending a leadership course were interviewed in a focus group format in this first
data collection. The second step included seven participants from two different contexts, the Swedish Air Force and the Swedish Joint Forces Command of peacekeeping forces in different parts of the world. The first group was selected to represent a so-called high-reliability organization and the second to represent a much lower degree of high-reliability organizational aspects.

The interviews consisted of one open-ended question and individual follow-up questions. The question was: “Give personal positive and negative examples of indirect leadership”. Typical follow-up questions were: ‘What did you do?’ ‘What did you say?’, ‘What did you think?’ and ‘Please describe in more detail’, etc.” The interview with the subordinate employees focused on how they had experienced their respective high-level manager’s indirect leadership. Finally group interviews were done with three groups of colonels (five in each group). They were asked to give as many examples of positive and negative indirect leadership behaviours as they could come up with.

Both the interviews and the group session notes were transcribed verbatim and analyzed according to Glaser and Strauss’ (1967), constant comparative method. The interviews and the notes were first examined line by line, i.e. open coding to find themes and patterns in the answers. After that, the codes were sorted into different categories, and later on these categories were sorted into different superior categories. This was done by making constant comparisons between the codes, categories and superior categories. The next step was to fit together the superior categories and the categories using the constant comparative method. This resulted in a process model of indirect leadership.

Results
According to the model (see Figure 2), indirect leadership can be understood as a process beginning with ideas and mental models of higher organizational level managers on what to do (visions and goals), and also on how to get it done (implementation).
The developed model also suggests that indirect leadership can be understood as consisting of two simultaneous processes. One is action-oriented and consists of interaction with a link (usually a small group of directly subordinate managers) which passes the messages down to lower organizational levels. The other influential process is image-oriented and consists of being a role model. Both these processes are filtered through a “lens” which consists of the relative impact of a safety culture on the activities. In the favourable case, the employees at the lower levels trust both the link and the higher management. This appears to be a necessary condition for commitment and active participation. In the unfavourable case, there is a lack of trust. This breeds redefinitions of the messages and a necessity for relying on reward and punishment to obtain obedience.

Paper II: Indirect leadership: A quantitative test of a qualitatively developed model

Background
Little attention has been paid to the ‘hows’ of indirect leadership, that is, what leaders actually do to influence individuals two or more hierarchical levels below themselves. It is argued that knowledge of the ‘hows’ of
indirect leadership rests on weak empirical ground. According to this, a qualitative case study was performed to enhance the understanding of the issue (Larsson, Sjöberg, Vrbanjac & Björkman, 2005 – see paper I), using a grounded theory approach (Glaser & Strauss, 1967). The qualitatively developed model in paper I had, however, its limitations, especially due to its value in providing generalizable evidence. Therefore there seems to be a need to further develop a deeper understanding of indirect leadership. As a result, study II was conducted following up the results from the qualitative study in paper I, which addresses issues of validity related to the theoretical model of indirect leadership.

Aim
The aim of paper II was to explore the applicability of the qualitatively developed model (see paper I) of indirect leadership in a broader military context, using a conventional quantitative approach.

Method
The sample consisted of 281 participants: 147 Norwegians military officers, stationed at six army regiments and eight air force bases in Norway and 134 Swedish military officers, stationed at four army regiments and two air force bases in Sweden.

The methodology of this study was theory-driven, in an attempt to assess the generalizability of the previously developed model. The superior concepts and codes of the previous model were operationalized into three specific questionnaires: one for the high-level managers, one for the middle-level managers, and finally one for the lower-level employees. The wording of the statements in the questionnaires was inspired by the previous interview responses to make them more comprehensible to the participants.

As attitudinal scales are generally regarded as having ordinal-level characteristics, non-parametric methods were used on all statistical analyses but one. An exception was made with the responses from the lower-level employees. Here, a hierarchical multiple regression analysis was performed in order to test the full theoretical model. The Results scale was used as the dependent variable. The independent variables were entered in the following order: (1) Visions and Goals, (2) Safety Culture, (3) the Top Manager’s Image-Oriented Influence, (4) the Own Manager’s Action-Oriented Influence, (5) the Own Manager’s Image-Oriented Influence and (6) Trust. This parametric procedure was regarded as legitimate since the scales had acceptable response dispersions and reliability, and since the number of lower-level respondents was reasonably high. The multiple
regression analysis was carried out using data from the whole sample as well as on the national sub-samples separately, in order to evaluate the stability of the regression model.

**Results**

Using the responses from the lower-level officers, six sets of predictor variables were regressed on the Results scale in the order suggested by the theoretical model. The regression equation of the final model was statistically significant \( F = 7.24, p < .001 \). Two sets of predictor variables made a significant contribution to the proportion of explained variance: Top Manager’s Image-Oriented Influence and Own Manager’s Image-Oriented Influence. An almost identical result was also found in the national subsamples. In the final model, only two single variables had a significant F value: Own Manager’s Inspiration \( F = 9.78, p < .002 \) and Top Manager’s Communication \( F = 4.11, p < .046 \). The latter variable had a negative Beta value (-0.19). Similar results were obtained in the national sub-samples. In order to better understand the reverse direction of the contribution of the variable Top Manager’s Communication, bivariate correlations (Pearson) were computed between all predictor variables in the multiple regression analysis and the Results scale. All scales showed a positive correlation with Results and all bivariate correlations but Safety Culture vs. Results was statistically significant \( p < .01 \). The correlation between Top Manager’s Communication and Results was 0.23 \( p < .001 \).

Comparisons were also made between the high-, middle-, and lower-level officers in the model. Statistically significant differences across the three hierarchical groups were noted on Visions and Goals, Rule breaking, and the total Safety Culture score. Pair-wise comparisons showed that the high-level managers had significantly more favourable scores than the other two groups on these scales. When it comes to comparisons between the Norwegian and Swedish officers, the results show that the Norwegian officers, at all levels, scored higher (more favourably) than the Swedish counterparts on all scales. On the scales which were identical for all participants, the difference was statistically significant \( \text{Mann-Whitney } U \)-tests, \( p < .05 \) on the following indices: Visions and Goals, Mistakes and Results. On the scales where high- and middle-level managers reported their indirect leadership, the difference was significant for seven (out of 21) scales (Selection of link, Interaction with link – Behaviour, Value base – Preferences, Conscious effort – Behaviour, Appreciation – Behaviour, Competence development – Behaviour, and Information handling – Behaviour). A comparison of the lower-level officers from the two countries on the last-mentioned scales also showed that the Norwegian
officers had significantly more favourable scores on five scales (Clarity – own manager, Information handling – own manager, Selection of link – top manager, Interaction with link – top manager, and Clarity – top manager).

**Paper III: Leadership in complex rescue operations: A qualitative study**

**Background**

The rescue services have a reputation for adequately handling smaller events such as car fires and limited apartment fires, but perform less well in large-scale operations. This is understandable from a prevalence perspective. Large-scale and long-lasting rescue operations are not so common for Swedish rescue services. These more complex operations often involve staff from several rescue services, personnel from other organizations such as the police force and health care, as well as several volunteers, etc. These events usually also last much longer than the smaller more everyday ones, and also frequently attract more interest from the media. The existing research in this field has dealt with post-operation support such as psychological debriefing or computer-based fire simulations. The research in the area of leadership in stressful, large-scale rescue operations is apparently lacking.

**Aim**

The aim of the current study was to develop a theoretical understanding of leadership in stressful, complex rescue operations.

**Method**

The method used in this study was a qualitative grounded theory approach (Glaser & Strauss, 1967). All in all, twenty rescue operation commanders who had been working on four different complex rescue operations in Sweden were interviewed. The selection of rescue operations was guided by the desire to find operations that involved rescue personnel from at least a whole region (several municipalities) and that were generally regarded as complex and stressful in nature. In cooperation with the Swedish Rescue Services headquarters in Sweden, four rescue operations and one contact person from each operation were selected. The informants were selected to represent a variety of occupational roles in the rescue operation. All operations took part in Sweden. The operations were:
(1) A flood in 2000, the most extensive in the country’s history. It was caused by heavy rain in combination with mild weather conditions. Thousands of properties were threatened as well as local infrastructure. Several organizations were involved as well as many volunteers. Although the operation was large and complex, it was fairly stable and predictable. Five informants were selected from this operation: two Chief Fire Officers, one Logistics Manager from the rescue services and two people from the municipality administrations.

(2) A train derailment in 2000. This accident was caused by an intoxicated driver who entered a curve at a railway station at too high speed. Seven wagons loaded with propane were derailed. Parts of the town where the accident happened were shut off. Rail traffic was greatly reduced and a local shopping mall was closed for a whole week. One of the biggest decisions during this accident was if the wagons should be emptied where they were, or be lifted away first. For this accident, six interviews were conducted with the following individuals: one Chief Fire Officer, four Incident Commanders and one observer/member of the support staff.

(3) Fire in a national park in 1999. This rescue operation had continued for eight days until rain finally ended it. Several rescue services and other organizations, plus almost a thousand people were involved in this operation. Two big issues in this operation were the warm and dry weather conditions and the location in a national park. Four interviews were done, with the Chief Fire Officer, two Incident Commanders and one Chief of Staff.
The last incident is a 2003 fire where a firefighter was killed. This operation was the shortest but the most dynamic of those selected. The operation was fairly ordinary until one of the SCBA fire fighters did not return after trying to locate the fire inside a restaurant. In this operation the most difficult decision was to stop searching for the missing firefighter. Five informants were interviewed related to this operation: one Chief Fire Officer, one Incident Commander, one Operations Officer, one Incident Site Officer and finally one Chief of Staff.

The twenty informants were interviewed according to a prepared interview guide. The interviews were transcribed verbatim and then analyzed according to the constant comparative method by Glaser and Strauss (1967). The first step was “open coding” where data were examined line by line in order to identify the informants’ descriptions of thought patterns, feelings, and actions related to the interview themes. The codes were then sorted into different categories. The next step consisted of fitting together the categories using the constant comparative method.

**Results**

The codes and categories identified resulted in a hypothetical model of leadership in complex, stressful rescue operations (see figure 3).
A model was developed which suggests that leadership in stressful, complex rescue operations can be understood as a causal process consisting of three broad time-related categories. The pre-operation everyday working conditions affect leadership during rescue operations, which in turn affect the post-operation everyday working conditions, etc. Everyday working conditions include training and exercises, previous mission experiences,
personal knowledge of co-actors and organizational climate. Leadership during a complex rescue operation is affected by the leader’s appraisal of the balance between what is at stake, human lives in particular, and the manageability of the situation. Patterns of stress reactions among rescue commanders and their leadership behaviour and managerial routines were identified. Three problem areas were noted: role shifts during long-lasting operations, staff work and practical routines. The post-operation conditions include the leader’s evaluation of the outcome, organizational climate, and post-event stress reactions.

**Paper IV: Leadership in Complex, Stressful Rescue Operations: A Quantitative Study**

**Background**

Leaders in professions such as the ambulance service, police force and rescue services have to deal with many different types of rescue operations. The way these leaders handle the operations can have a great impact on saving lives and reducing human suffering (Kivimäki & Lusa, 1994). Some rescue operations are easier to handle than others, for example more complex operations. These complex rescue operations often involve several people, units, organizations, and sometimes even several countries (Fredholm, 2010). From a leader’s perspective these operations can be problematic as the demands become different and bigger and the leaders have to go beyond their well-established frames and routines. Research on leadership and decision-making in highly stressful operational events has generally focussed on face-to-face leadership in a military context (Larsson et al., 2001). There seems to be a lack of integration of leadership and decision-making during new, complex and stressful rescue operations. Following this, a qualitative case study (Sjöberg, Wallenius & Larsson, 2006 – see paper III) was performed to enhance the understanding of the issue. The qualitatively developed model had, however, its limitations, especially when it comes to value in terms of providing generalizable evidence. According to this, study IV was conducted to follow up the results from paper III, which addresses issues of validity related to the theoretical model of leadership in complex, stressful rescue operations.

**Aim**

The aim of paper IV was to explore the universality of a qualitatively developed model of leadership in complex and/or stressful rescue operations (see paper III), this time in a broader context, using a conventional quantitative approach.
**Method**

The sample consisted of 385 participants from three organizations with experiences of leadership during complex and/or stressful rescue operations. The sample could be described as a convenience sample rather than being randomly selected. The organizations were: the ambulance service \((n = 129)\), the police force \((n = 93)\), and the rescue service \((n = 163)\). These organizations were selected in cooperation with a contact person at the Swedish Rescue Services Agency headquarters. The aim of the selection was to mirror three of the most frequently cooperating organizations in these kinds of rescue operation.

A self-made questionnaire was used, which represents an attempt to operationalize the codes and categories of the qualitatively developed model (Sjöberg et al., 2006). Attached to this questionnaire was the Emotional Stress Reaction Questionnaire (ESRQ) (Larsson, 1987; Larsson & Wilde Larsson, 2010). Three time segments were covered: (1) the everyday working conditions before a complex and stressful rescue operation, (2) different aspects during such an operation and (3) the outcome of the operation.

Inspired by Fredholm (2010) the during-phase in turn was divided into two sub-phases: “what-is-this phase” covering the time from the alarm to the point where the respondent knew what the incident was about, and “gain-control phase” which refers to the phase when the respondent knew that he or she could control the event.

Non-parametric statistics were used to analyze differences between subgroups (Kruskal-Wallis test and Mann-Whitney U-tests) and bivariate correlations (Spearman). Statistical significance was assumed at \(p < .05\). However, as multiple comparisons were made, a Bonferroni correction was performed \((0.05/24)\) yielding a significant level of \(p < .002\). Hierarchic logistic analyses were performed within the What-is-this-phase as well as the Gain-control-phase in order to find contributions to the odds of the leaders’ reporting favourable outcome of the operation: Dichotomized scores \((1 - 3 = 1 \text{ and } 4 - 5 = 2)\) on the leader’s evaluation scale were used as the dependent variable. The Everyday condition scales were entered on step 1, the leader’s degree of positive stress reaction on step 2, and the leadership and decision-making scales on step 3.

**Results**

The results show that most scales that are designed to measure the codes developed in the preceding qualitative study were significantly correlated with one of the outcome indices: the leaders’ own evaluation of the mission outcome. Most of the correlations with the other two outcome indices,
The sample consisted of 385 participants from three organizations with experiences of leadership during complex and/or stressful rescue operations. The sample could be described as a convenience sample rather than being randomly selected. The organizations were: the ambulance service ($n = 129$), the police force ($n = 93$), and the rescue service ($n = 163$). These organizations were selected in cooperation with a contact person at the Swedish Rescue Services Agency headquarters. The aim of the selection was to mirror three of the most frequently cooperating organizations in these kinds of rescue operation.

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The results show that most scales that are designed to measure the codes developed in the preceding qualitative study were significantly correlated with one of the outcome indices: the leaders' own evaluation of the mission outcome. Most of the correlations with the other two outcome indices, organizational climate and stress reactions respectively, were low. The analysis using What-is-this-phase data indicates that the following scales contribute to the odds of reporting a favourable outcome: Organizational climate (Everyday conditions), Positive stress reaction and Personal knowledge of the co-actors (the two last mentioned scales were mission-specific). Turning to the Gain-control-phase, the two last-mentioned scales once again made a statistically significant contribution. The total regression models were statistically significant in both analyses ($p < .001$). In the analysis of the What-is-this-phase data, all three steps made a statistically significant contribution ($p < .05$). In the Gain-control-phase data analysis, the Everyday condition scales (step 1) and the Positive stress reaction scale (step 2) made a significant contribution ($p = < .01$), while the remaining mission-specific scales (step 3) did not ($p = .134$).

The study showed that the most important factors in explaining the outcome of complex rescue operations were organizational climate before the incident, positive stress reactions, and personal knowledge of the co-actors during the episode. Cases where the leader appraised that the situation could not be resolved with the available resources were characterized by less favourable ratings, irrespective of whether humans were perceived as being threatened or not. The strength of this controllability aspect was interpreted in terms of a professional action-oriented identity.
Discussion

The four papers included in this thesis have endeavoured to further the understanding of leadership in military and rescue services operations, especially during highly stressful or complex situations. Papers I and II have attempted to answer the first research question: How can indirect leadership in a military context be understood. The focus of papers III and IV has been to answer the second research question, i.e. How can leadership during stressful rescue operations be understood.

In the following, the findings in these papers will be discussed. After this, an attempt is made to identify general aspects across all four studies. Finally, methodological issues, practical implications of the findings, and some suggestions for future research will be presented.

How can indirect leadership in a military context be understood?

In papers I and II, a model was developed which suggests that indirect leadership can be understood as a process, beginning with the ideas and mental models of managers at higher organizational levels regarding what to do and how to do it. Two simultaneous influence processes were identified, action- and image-oriented.

Action- and image-oriented influences

The higher organizational level manager has two co-occurring pathways to influence the subordinates. One is action-oriented i.e. leading through a link, which can consist of an individual or as more common, a group of individuals. This fits well with Yammarino’s (1994) cascade form of indirect leadership. The interaction between the indirect leader and this/these links is essential for indirect leadership, as it is the link or links that conveys the messages to the lower organizational levels. According to the findings, the selection and relation with this or these links is essential for indirect leadership.

The other pathway of influence is image-oriented, which involves being a role model for the subordinates. In the favourable case, the indirect leader influences the subordinates by being a good role model, with the result that subordinates have trust in both the link and the higher management. This favourable case is a necessary condition for commitment and active participation, and is particularly important as lives may depend on this trust. However, in an unfavourable case, there is a lack of trust, which could result in rewards and punishment being necessary to reach the goals outlined by the higher-level management.
The findings in paper I indicate problems which the informants had in distinguishing direct and indirect leadership. This, in combination with the content of the two influence processes, the action-oriented and, even more so, the image-oriented influence process, have many similarities with previously presented leadership research. The codes, categories and superior categories in paper I show a clear resemblance to some direct leadership theories, such as the major components of transformational leadership (Bass, 1998), developmental leadership (Larsson et al., 2003), and authentic leadership (Gardner et al., 2005). Thus, it supports the idea that these kinds of leadership also have great relevance for leadership in indirect form. Empirical support of this has been reported by Avolio et al. (2004) in a hospital setting and by Dvir, Eden, Avolio & Shamir (2002) in a military context (platoon level). Hersey and Blanchard (1969) argue the need for high social skills at all levels of management, and from this it could be assumed that transformational, developmental and/or authentic leadership offers a rich platform for practising a successful indirect leadership.

The full model test in paper II partly supported the model concepts in study I. Higher importance was attributed to image-oriented influences than to action-oriented influences when leading through one or more link/links. Four out of six sets of model-based predictor variables did not contribute significantly to the amount of explained variance in the regression analysis. However it should be noted that all of these predictor variables but one, Safety Culture, showed a statistically significant bivariate association with the results rating, made by employees.

The significant contribution in the multiple regression analysis of the Top Manager’s Communication, with a reverse direction is difficult to understand. Looking at the bivariate correlation between this scale and the Results scale, a logical outcome was found (a positive and statistically significant correlation of 0.23). A likely alternative explanation is that the outcome in the regression analysis illustrates the problem of multicollinearity.

The high-level officers scored higher (more favourably) than the middle- and lower-level officers on the scales designed to measure Visions and Goals and Safety Culture respectively. A possible explanation is that they may feel more responsible for these aspects, and, in the case of visions and goals, a stronger identification. However, on most comparisons between the high- and middle-level officers a high degree of agreement was found. A possible explanation is the tendency for high-level managers to select subordinate managers who think and act like themselves. Another possibility is that the two groups have interacted effectively and reached a
shared mental model. This could be understood in light of the research tradition on situation awareness (Endsley, 1995; Endsley, Holder, Leibrecht, Garland, Wampler & Matthews, 2000) or organizational sensemaking (Weick, 1995).

The Norwegian officers reported significantly more favourable results than their Swedish counterparts on several scales. This could depend on the selection of the participants. The drop-out rate was considerably higher in the Norwegian sample and it is possible that only the individuals with the most positive attitudes responded. Another reason could be that most army and air force units in Norway are smaller than those in Sweden. This could have a favourable effect on mutual personal knowledge and organizational climate. Third, despite great similarities between the two countries, there are also differences, particularly related to military issues. Norway was heavily involved in World War II, while Sweden was not. Norway is a member of NATO, Sweden is not. These past and present realities may contribute to a stronger sense of cohesion within units in the Norwegian defence. The smaller unit size, the high demands on safety routines and trust are potential reasons for the more favourable scores on some scales among the Swedish Air Force participants.

The safety culture lens
The safety culture lens is located between the hierarchical levels within an organization, which filters and affects the potential influence of the high-level managers. The findings in study I identified that this safety culture lens consisted of the following three categories: safety thinking, mistakes and rule breaking. However, later studies on indirect leadership have led to a revision implying that the safety culture lens is now seen as a part of the broader concept filter (which exists between all hierarchical levels, see Larsson, 2010). Because of this, it will not be discussed further here.

How can leadership during stressful rescue operations be understood?
In papers III and IV, the findings show that leadership during stressful rescue operations can be understood as a process consisting of three broad time-related parts: everyday working conditions, during the rescue operation, and outcome of the rescue operation.

Complexity
From a leader’s point of view, rescue operations become trickier and more difficult to handle, the more complex they become. With increased complexity, the demands on the leader also become different and higher.
Leading a complex operation could mean that the leader has to go beyond his or her ordinary frames and routines and think in a new way. One example could be that the leader has to lead approximately one thousand individuals instead of a small group, which is more common in ordinary routine rescue operations (Sjöberg et al., 2006).

But not only are these bigger and more complex operations challenging for a leader. Small-scale operations can also be rather complex in nature and also perceived as stressful. Although the respondents in paper IV were asked to report a large-scale complex incident, most episodes were small in nature. This is probably due to the fact that large-scale accidents and disasters are unusual and most participants did not have any such experience. The comparison which was made between the large-scale events and the smaller ones showed almost no differences in terms of the model components. This can be interpreted as additional support of the importance of the controllability appraisal aspect discussed above. Also small-scale accidents can be perceived as highly stressful if leaders appraise them as unresolvable with the available resources.

Complex rescue operations imply a need for field staff as well as strategic staff. This was often associated with a lack of clarity regarding roles and tasks, and with communication problems. Personal knowledge and exercises were mentioned as facilitating factors here. These results are consistent with those noted in military peacekeeping missions (Johansson, 2001). Practical routines appeared to be related to difficulties arising when routines from less complex operations were to be applied in long-lasting and complex ones. This required creative solutions, which in at least two of the cases did not work well until the rescue services were assisted by military personnel. The latter group typically has experience of large-scale, long-lasting operations. In this area, the rescue services can probably benefit by incorporating knowledge and experience from the military (Van Creveld, 1977).

**Everyday working conditions**

Personnel within organizations such as the military forces or rescue services are prepared for and experienced in handling stressful situations. Through selection, education and experience they have had opportunities to develop skills to keep performing well, despite a high degree of stress. It is however important to not forget or neglect the need for rest, recovery and even sleep (Åkerstedt & Kecklund, 2005), which could especially be the case during stressful and long-lasting operations. It is also important to maintain these skills and keep training and educating for further and unexpected challenges. One way to maintain and further develop these skills can be to
increase the awareness of different factors’ interaction in stressful and complex situations or operations.

Leadership during stress can be understood in light of several interacting factors (Larsson et al., 2003). Paper III shows that the interaction between leader and organizational characteristics forms the everyday leadership, which, in turn, affects what happens during an operation. There are particularly two main groups of leader characteristics which are significant for leadership during acute stress, the generally personal descriptive and the professional-related (Larsson et al., 2003). The personal descriptive includes physical capacity, a confident personality and confident values. The professional-related characteristics include professional skills, social competence, consideration, identification and engagement. For this reason it seems essential to take these traits into account when selecting leaders for these kinds of tasks. It has been described earlier that leaders who are transformative, developmental or authentic have good starting points to become trustful leaders. When it comes to leadership in military and rescue operations, and especially during stressful operations when lives could be at stake, this implies great demands on the leader’s ability to handle these situations. One advantage is the possibility of selecting leaders for higher positions from internal recruitment, which is common in these organizations (Andersson et al., 2006). By this selection process, it is possible to have seen the leader in real action as well as to have personal knowledge of him or her. This has been shown, in paper III, to be an important factor in everyday working conditions, to have a good starting point when a stressful event occurs.

**During the rescue operation**

The findings in studies III and IV show that there are several components which interact during complex and stressful rescue operations. The four cases studied in study III differ considerably when they are described using well-established situational concepts from stress theory (Lazarus & Folkman, 1984) such as duration, intensity, ambiguity, predictability, controllability, etc. However the interpretation of the interview stories points to greater similarities than differences between the episodes when analyzed from a leadership perspective. Episodes evaluated as uncontrollable and, at the same time, having people who are threatened, generated the strongest stress reactions among the rescue operation commanders. This result fits with Lazarus’ (1991; 1999) stress theoretical formulations. Evaluation of people at risk can be seen as primary appraisal and assessment of possibilities to control the situation as secondary appraisal. The issue of people at risk was recurring in most interviews. This
strong emphasis probably reflects the primary goal for all rescue services in Sweden – to save lives.

The core category of the theoretical model is the leader's appraisal of whether people are threatened or not and if the situation can be influenced or not. A cross-tabulation of these two kinds of appraisal reports showed that they appeared to affect almost all model components. It also showed that the key variable was whether the leader appraised that the situation could be influenced or not. The impact of the appraisal regarding the likelihood of a threat to humans was weaker. This finding implies an elaboration of the model and shows something which could not be asserted on the basis of qualitative data alone. The influence or control aspect finds considerable support in general working life research (see e.g. Karasek & Theorell, 1990). The relative superiority of this aspect versus the threat to humans could be interpreted as an indication of the strength of a professional action-oriented identity of being able to handle difficult situations. More research is needed to clarify this.

**Outcome of the rescue operation**

In study IV, the outcome of bivariate correlations between the individual components of the theoretical model and the participants’ experiences of the outcome of a self-chosen complex and stressful rescue operation shows that almost all components seem to be important. The outcome of the logistic regression analyses indicates that two model components are particularly important: the leader’s degree of positive stress reactions (the more positive the better) and the leader’s degree of personal knowledge of the co-actors in the rescue work situation (the more the better). The stress reaction result is in line with previous research using the same instrument (ESRQ) in highly stressful situations among athletes (Larsson, 1987) and police officers (Larsson, Kempe, & Starrin, 1988). The impact of social support from colleagues or buddies has been studied before (see e.g. Fullerton et al., 1992). In previous studies the impact of the personal knowledge of the co-actors in these kinds of contexts has not, however, been demonstrated as explicitly as here. The emphasis placed on previous experiences of complex rescue operations can be seen in the light of Klein’s (1989; 1993) writings on recognition-primed decision-making. The results indicate that many fire chief commanders are at a disadvantage when a complex event occurs because they have no previous experience of such events.
Common themes across all studies
Although the thesis is built up around two different research questions, where empirical studies have been performed in two different professional groups, an attempt will be made in this section to identify common themes which appear to be relevant in all studied settings. Beginning at the paradigmatic level, the interactional person-by-situation perspective (Endler & Magnusson, 1976) can be regarded as a firm theoretical ground for both developed models. This means that the suggested model of indirect military leadership, as well as the model designed to illuminate leadership in complex and stressful rescue operations, both have an anchorage in a mainstream psychological framework.

A second common theme which appears to be relevant in both military and rescue services settings is the identification of important individual antecedent conditions. These consist of psychological traits such as emotional stability, social competence and stress resilience (cf. Yukl’s (2006) list presented in the section Theoretical framework) as well as knowledge, skills and experiences gained through professional socialization processes. Further studies are needed to evaluate the generalizability of these findings to other professional groups operating in severely demanding situations.

A third common characteristic of both models is that they include an appraisal or sense-making part. When the person-environment relationship is combined with the subjective process of appraisal, the personal significance of the relationship is highlighted. Lazarus (1991) labels this the relational meaning of a given person-environment encounter.

A fourth common aspect is that both models can be related to significant parts of the transformational, developmental and authentic leadership models. The resemblance between these three established models on the one hand, and the image-oriented (role model) influence process in the indirect leadership model on the other, has already been discussed. The role model aspect is also important in the model of leadership in complex and stressful rescue operations. The leader’s appraisal of a given situation affects his or her stress reaction and behaviour. This, in turn, could be assumed to affect the stress reaction level and trust experienced by the subordinates, and ultimately the quality of the operational behaviour. This line of reasoning finds support in two recent theoretical papers on leadership (Eid, Mearns, Larsson, Laberg & Johnsen, 2012; Larsson & Eid, in press).
Methodological issues
All kinds of methods have their strengths and weaknesses, as discussed above. In this thesis multiple methods have been used, i.e. both qualitative and quantitative ones. The main reason for that is that these methods can complement each other and can also increase the validity of the developed models in the papers.

The qualitative studies
The strength of study I is the identification and modelling of a number of limit-setting conditions, thought patterns and behaviours used in indirect leadership. The main weakness of the both studies I and III, as often in qualitative methods, is the lack of representativeness. In constructing the models in both studies, one limitation was that interview data were obtained from a limited group of informants. Thus, the studies rely on self-reported data only, which may be inaccurate.

In study I it could be argued that, for reasons of social desirability, the informants paid more attention to aspects such as strategic ideas of what to do and being an exemplary model, rather than on everyday issues such as countless brief meetings, e-mails, telephone calls, etc. (cf. Watson, 2001). A broader range of context-specific data would also have been desirable. The issue of indirect leadership via mass media is also deficient in data. Yet another area not covered is the potential impact of indirect influence from lower levels to higher levels (Yammarino, 1994). Theoretical models tend to be over-simplifications of reality and bidirectional arrows of influence may be more accurate.

It should also be emphasized that the concepts derived from the data in both studies I and III are of a sensitizing rather than definitive character as described by Blumer (1954). In study III for example, bringing a variety of leadership actions together under the heading “managerial routines” could be questioned, although this actual word occurred frequently in the interviews. The rather narrow kind of data related to the post-operation situation illustrates this. A broader range of outcome aspects, for instance material resources and economic issues, would probably have been illuminated if additional data collection methods had been used.

Another limitation in study III concerns the retrospective descriptions of the incidents as two to six years had passed between the incidents reported and the qualitative interviews. In spite of this, studies have shown that memories of stressful events can be fairly reliable (Norris & Kaniasty, 1992) and that central detail information from demanding or stressful episodes is often retained better than information from more neutral ones.
(Christiansson, 1992). However, it cannot be excluded that various kinds of psychological processing may have affected the memory.

The quantitative studies

In study II, the operationalization of the theoretical model developed in study I resulted in three organizational level-specific questionnaires. Strengths of these instruments include the fact that the items and scales are related to an empirically based model of indirect leadership. The scales also had acceptable reliability and a meaningful differentiation pattern between subgroups was obtained. A weakness is that not all aspects of a top-down influence process are covered. Another weakness is that most items in the three questionnaires are not identical, which limits the possibilities of inter-level comparisons. There are, of course, several other study limitations. One, and this is because of the content of the theoretical model, is that only top-down processes of influence were mapped. In reality, indirect leadership is obviously also affected by bottom-up influences.

One of the strengths in study IV was the high number of reported events. A further strength of this study was the selection of the three organizations as they frequently cooperate in complex and stressful rescue operations. This adds to the generalizability of the results. On the other hand, having participants from three different contexts reduces sample homogeneity.

In study IV, the modest reliability coefficients of some scales and the high drop-out rates among participants from the police force and the rescue service are weaknesses that limit the generalizability of the findings. The drop-out rate is, however, difficult to assess properly due to the method of questionnaire administration. The high drop-out rate could depend on the lack of leaders with experience of these kinds of rescue operations, or on the way the contact people administrated the questionnaires. Among the ambulance personnel, where the researchers were personally present, there were no drop-outs. Finally, the dichotomization of the outcome variables in the logistic regression analyses inevitably implies a reduction of the details provided in the original raw data.

One can, of course, ask oneself what is required to regard the results from these types of quantitative studies as sufficient evidence to conclude that a theoretical model is supported or not. Compared to the gold standard study design in terms of evidence weight, the randomized controlled trial (RCT), the present cross-sectional approach comes out as lightweight. On the other hand, given the complexity of indirect leadership in organizations as well as leadership in rescue operations, RCT designs are
extremely difficult to realize in a meaningful way. Thus, accepting the second best kind of approach, a thorough evaluation of the presented models would still require a number of studies in different organizational settings. In the present cases, one study only can be reported in each case, where some, but not all, operationalized model concepts showed statistically significant relationships with a rating of organizational results made by employees.

**Practical implications**

**Indirect leadership**

Compared to existing models of indirect leadership, the model presented in study I identifies a number of potentially important thought patterns and behaviours. Additional studies of indirect leadership in a variety of organizations are needed to further develop, formalize, and evaluate the effectiveness of this model. If such studies confirm the suggested process model and its underpinning parts, it may be a valuable tool in higher management education.

In study II, meaningful patterns of subgroup differences were obtained. The main theoretical implications are: (1) that all central model concepts are supported in themselves by existing research and (2) that the identification of two parallel influence mechanisms adds a potentially valuable how-aspect to the relationship between these concepts. A practical implication is that the results support and legitimize the model as a tool to be used in higher military education and coaching.

The findings in both papers I and paper II may contribute by enhancing the theoretical understanding of the how of indirect leadership in a military context. The theoretical developed model has also been tested and validated in a civilian setting. Due to this, it can also be used as a tool in higher management education and coaching, as well as a tool when designing an organization, for example regarding how to select senior leaders and their links.

**Leadership in complex rescue operations**

Practical implications based on studies III and IV are that the results give preliminary support and legitimacy to the model as a tool to be used in training and exercises. A complementary practical implication, based on the observed importance of knowledge of one’s co-actors, is that exercises should be arranged where actors from these commonly mission-involved professional groups come together and get to know each other. This knowledge may make a difference at later stages when accidents occur.
Both these papers highlight various interacting factors that may be decisive in a rescue operation and the findings can thus serve as a guide when selecting a rescue leader as well as designing the organization before operations.

**Suggestions for future research**

**Indirect leadership**

One of the limitations of the studies about indirect leadership was that the theoretical model only shows top-down processes. Obviously, indirect leadership is also affected by bottom-up influences, and one suggestion for further research in this area would be to further develop the understanding of indirect leadership processes from a bottom-up perspective.

Another suggestion for future research is to test the model in other contexts, and especially in a more heterogeneous context, this to study if there are any gender-related differences within indirect leadership. Other suggestions include testing the model in study II in organizations less characterized by the line-management tradition and more focussed on distributed leadership in a network of teams. Still another suggestion for future research is to analyze the relationship between high-level managers’ personality and indirect leadership (cf. the emphasis on moral aspects, confidence, hope, optimism and resiliency in the recent writings on authentic leadership; Gardner et al., 2005).

**Leadership in complex rescue operations**

Just like the military forces, the rescue services in Sweden are a male-dominated work environment. It would be interesting to study if there are any gender-related differences within the leader’s appraisal of, and behaviour in, a stressful rescue operation. It would also be interesting to study the influence of time, i.e. in relation to when the event occurred. Another suggestion is to complement self-report data with other sources such as formal reports and expert ratings. It could also be worthwhile to study the theoretical developed model after a leadership intervention of any kind to find out how the leadership changes over time and over education.

One problem area that was noted in each of the three large-scale rescue operations in study III was role shifts. Having different roles during different shifts in a long-lasting rescue operation appeared to create a lack of clarity in leadership management, partly for the leader, partly for those around him or her. Having practiced role shifts during exercises, and having good personal knowledge of each other, were mentioned as facilitating factors. As the issue of role shifts appears to be complex for
leaders as well as for those being led, and since there seems to be a lack in the leadership literature about this issue, it could be suggested that future research should addressed it directly. One guess is that role shifts in stressful situations increase the likelihood that behaviour is determined more by the core of one’s personality than by role identities built up in the work socialization process.
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