Stockholm University

Why jump out of a perfectly good airplane?

Parachute training, self-efficacy and leading in combat

David Bergman

Doctoral Thesis in Psychology at Stockholm University, Sweden 2021

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Academic dissertation for the Degree of Doctor of Philosophy in Psychology at Stockholm University to be publicly defended on Friday 26 March 2021 at 10.00 in David Magnussonsalen (U31), Frescati Hagväg 8.

Abstract

Training military officers to lead in combat has always presented a training paradox: it is impossible to expose individuals to the inherent strains and dangers of real combat, but combat is where they are supposed to lead, making those demands normative for training. To overcome this paradox, the military uses training courses where stress is as realistic as possible within ethical limits. One frequent example of such a course is parachute training. Completing one demanding task (parachuting) can also increase the individual's belief that other tasks with equal or even greater difficulty (leading in combat) can be overcome similarly. The overall aim of this thesis was to investigate whether and how military parachute training can function as a method for leadership development. The purpose of Study I was to investigate whether military parachute training was associated with an increase in leadership self-efficacy. The results show that parachute training increased leader self-control efficacy when compared to the different training of a group of cadets. In addition, the training given contributed to increased leader assertiveness efficacy for both groups. The purpose of Study II was to investigate whether the inability to complete training was associated with any direct and sustained effects. The results show that there were no differences between those who completed training and those who did not. Regarding outcome, leader self-control efficacy decreased significantly for those who were unable to complete training when compared to those who did. The purpose of Study III was to examine how the two sub-domains of leadership self-efficacy examined in the first two studies were associated with leadership behaviors, specifically those described in the developmental leadership model. The results show that leader assertiveness efficacy was the best predictor to the dimensions of developmental leadership. Leader self-control efficacy seems to be more related to functioning within an extreme context. Overall, the thesis indicates that parachute training can help to prepare future military leaders to lead in combat. The results imply that the effects of parachute training are indirect rather than directly associated to leadership and that ability to remain composure in extreme situations in turn enables individual behaviors, including leadership. The thesis also contributes insight into the process of how personal beliefs can be transferred or generalized across different areas or domains in a person's life. The results are also relevant for other professions that routinely work in extreme contexts.

Keywords: *Parachute, leadership, self-efficacy, combat, training.*

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Abstract

Training military officers to lead in combat has always presented a training paradox: it is impossible to expose individuals to the inherent strains and dangers of real combat, but combat is where they are supposed to lead, making those demands normative for training. To overcome this paradox, the military uses training courses where stress is as realistic as possible within ethical limits. One frequent example of such a course is parachute training. Completing one demanding task (parachuting) can also increase the individual's belief that other tasks with equal or even greater difficulty (leading in combat) can be overcome similarly. The **overall aim** of this thesis was to investigate whether and how military parachute training can function as a method for leadership development. The purpose of **Study I** was to investigate whether military parachute training was associated with an increase in leadership self-efficacy. The results show that parachute training increased leader self-control efficacy when compared to the different training of a group of cadets. In addition, the training given contributed to increased leader assertiveness efficacy for both groups. The purpose of **Study II** was to investigate whether the inability to complete training was associated with any direct and sustained effects. The results show that there were no differences between those who completed training and those who did not. Regarding outcome, leader self-control efficacy decreased significantly for those who were unable to complete training when compared to those who did. The purpose of **Study III** was to examine how the two sub-domains of leadership self-efficacy examined in the first two studies were associated with leadership behaviors, specifically those described in the developmental leadership model. The results show that leader assertiveness efficacy was the best predictor to the dimensions of developmental leadership. Leader self-control efficacy seems to be more related to functioning within an extreme context. **Overall**, the thesis indicates that parachute training can help to prepare future military leaders to lead in combat. The results imply that the effects of parachute training are indirect rather than directly associated to leadership and that ability to remain composure in extreme situations in turn enables individual behaviors, including leadership. The thesis also contributes insight into the process of how personal beliefs can be transferred or generalized across different areas or domains in a person's life. The results are also relevant for other professions that routinely work in extreme contexts.

Sammanfattning

Att utbilda blivande officerare att leda i strid har alltid inneburit en träningsparadox: det är omöjligt att utsätta individer för de inneboende påfrestningarna och farorna med riktig strid, men strid är den miljö där de förväntas leda vilket gör den normerande för all träning. För att överkomma paradoxen använder militära organisationer utbildningar som utsätter individer för så extrem stress som möjligt inom etiska gränser. Ett vanligt exempel på detta är fallskärmsutbildning. Att överkomma en svår uppgift (fallskärmshoppning) kan öka individens tilltro att andra uppgifter med lika eller ökande svårighetsgrad (leda i strid) kan överkommas på samma sätt. Det **övergripande målet** med avhandlingen var att undersöka om och hur militär fallskärmsutbildning kan fungera som en metod för utveckling av ledare. Syftet med **Delstudie I** var att undersöka om militär fallskärmsutbildning var associerad med en ökad självtillit. Resultaten visar att fallskärmsutbildningen höjde individernas tillit att utöva självkontroll jämfört med en grupp som fick annan utbildning. Utbildningen höjde individernas tillit att utöva självsäkerhet, men lika för båda grupperna. Syftet med **Delstudie II** var att undersöka om oförmågan att fullfölja fallskärmsutbildningen var associerad med några direkta och ihållande negativa-effekter. Resultaten visar att det inte fanns några skillnader mellan de som fullföljde utbildningen och de som inte gjorde det. Angående utfall, sänktes tilliten till självkontroll för de som ej fullföljde utbildningen jämfört med de som gjorde det. Syftet med **Delstudie III** var att undersöka hur sub-domänerna inom självtillit som undersöktes i de första studierna relaterade till ledarskapsbeteenden, specifikt de beskrivna inom domänerna i den utvecklande ledarskapsmodellen. Resultaten visade att individens tilltro till sin egen förmåga att utöva självsäkerhet var en bättre prediktor till utvecklande ledarskap. Förmågan till självkontroll verkar vara mer relaterad till att kunna fungera i extrema situationer. **Övergripande** visar avhandlingen att fallskärmsutbildning kan bidra till att förbereda blivande militära officerare att leda i strid. Resultaten antyder att effekterna av fallskärmshoppning är indirekt snarare än direkt relaterade till ledarskap och att förmågan att kunna bibehålla lugn i extrema situationer i sin tur kan möjliggöra individuella beteenden, inklusive ledarskap. Avhandlingen bidrar även med insikt i processen för ledarskapsutveckling och hur individers tilltro till sina egna förmågor kan generalisera mellan olika domäner. Resultaten är även relevanta för andra yrkesområden som regelmässigt arbetar i extrema kontexter.

Acknowledgments

”Writing about parachuting is cursed!” The warning came from several of the seasoned paratroopers and skydivers, cautioning me that such projects never end well. I had expected more encouragement from them, following the dismissal of the idea by one professor involved with my undergraduate studies. The professor warned me about getting too involved and recommended maintaining distance. He graphically told the story (probably an urban legend) about the anthropologist who wanted to study motorcycle gangs. The doctoral student committed to research with a participant observation design but soon ended up as a full-patch member, was convicted and received a jail sentence for possession of narcotics, and never finished his thesis. The story from the parachute community was similar in many ways. But contrary to the story about the anthropologist turned biker this story was definitely real. Jens-Henrik Johnsen was a highly experienced Norwegian parachutist, inspired and intrigued by an activity he loved. He wanted to examine why certain people are not only drawn to but also succeed and master high-stress situations like parachuting. In an ironic twist of fate, he died – in a parachute accident – only months before he was supposed to defend his dissertation on parachuting and earn his doctoral degree.

In essence, the argument from my old professor was not to get too involved in your research. One should maintain researcher objectivity and distance, preferably from a desk at the university. The message from the skydivers was that parachuting, an intense and almost spiritual experience, could only be understood by those who fully embraced the lifestyle, and was not meant to be shoehorned into a rigid scientific frame. For them, the search for the heart and soul of parachuting was for all intents and purposes like hunting a unicorn; the pursuit of something that is unobtainable as it does not exist. I dismissed the warnings of a curse and began my doctoral studies. The first part involved three years of data collection on parachute training courses for officer cadets, paratroopers and Special Forces operators. Comfortable in the role of a PhD student, I still took every opportunity I could to jump, both in Sweden and in the United States. Halfway through the thesis, having planned the mandatory half-time seminar, I was involved in a parachute accident. I miraculously walked away from the incident, a bruised ego the only real casualty. But some of the more experienced jumpers just shook their heads and in a low but stern

voice reminded me of the curse. Writing these words, I have no parachute jumps planned prior to defending my thesis.

This is an example of where a project is born out of personal interest and knowledge of the subject and it could not have been completed without the support of so many from different institutions. Most noticeably my main supervisor Erik Berntson and co-supervisor Marie Gustafsson-Sendén at Stockholm University. Also Dennis Gyllensporre from the Swedish Armed Forces headquarters who also served as a co-supervisor. I know I have not been the easiest student to mentor. Without your patience, knowledge and ability to force me to bring my ideas down to the ground – figuratively and literally – I could not have completed this thesis. Thank you also to everyone at the Swedish Defence University (FHS), the Command and Control Regiment (LedR) and the Swedish armed forces headquarters who have supported me along the way.

Studying parachuting is really hard without studying someone who parachute. The main part of the data collection could not have been performed without the open arms and unrestricted access to the parachute training school in Karlsborg (K3 FA/SFS) and their participants: The Military academy Karlberg (MHS K), the paratroopers from the 32nd Intelligence battalion (FJS) and finally the Special Operations Group (SOG). Thank you for the warm welcome. Following so many participants who jump from a perfectly good airplane for the first time has been a joy and a privilege. Finally, not forgetting the international exchange: a warm acknowledgment goes to the US Air Force Academy (USAFA) in Colorado Springs whose freefall program and self-efficacy research was a springboard that started this thesis.

List of papers

The thesis is based on the following papers

I. Bergman, D., Gustafsson-Sendén, M., & Berntson, E. (2019) Preparing to lead in combat: Development of leadership self-efficacy by static-line parachuting, *Military Psychology*, 31:6, 481-489.

II. Bergman, D., Gustafsson-Sendén, M., & Berntson, E. (2020). Direct and sustained effects on leadership self-efficacy due to the inability to complete a parachute training course. *Nordic Psychology*. 72:3, 222-234

III. Bergman, D., Gustafsson-Sendén, M., & Berntson, E. (2021) From believing to doing – The association between leadership self-efficacy and leadership performance, manuscript submitted for publication.

Contents

Introduction

Several detonations light the clear night sky over the small forward operating base in northern Afghanistan. The high-pitched buzzing sound of bullets passing overhead makes the soldiers crouch as they scramble to get their combat gear on and take up firing positions. The small outpost is a fort with sandbag walls located among a cluster of villages on the desert plains. The rhythmic detonations of eight rocket-propelled grenades shake the ground as the Taliban fighters continue to hit the ambushed patrol that has just left the base. On the radio net a first report can be heard: two wounded and one dead from the local police, requesting reinforcements.

Two persons are approaching the base from the east – from the opposite direction to the ambushed patrol. Even with night vision equipment it is impossible to identify if they are hostiles. Local farmers often walk the desert fields at night to reroute the irrigation channels, but the enemy also regularly disguise themselves among the local population. Shooting unarmed civilians might result in protests and in the worst case a riot by the villagers – the small base could be fighting the whole community by morning. But not shooting might let Taliban fighters get close enough to kill Swedish soldiers. Two more silhouettes join the first two and walk toward the base.

Reinforcements scramble from the main base, but they are still at least 30 minutes out. Close air support and helicopters for medical evacuation are on their way. The coordinates are double checked and confirmed on the radio-net. Even one digit wrong could have catastrophic consequences.

Within minutes two American fighter jets fly over the small base toward the position of the ambushed patrol. They are flying at minimum altitude close to the ground. The roar is deafening. 'Danger close' is confirmed on the air net; friendly forces in close proximity to the enemy. The detonations make the night as clear as day.

The local Afghan soldiers cheer. They want to run out into the night and hunt down the Taliban. But they are poorly trained and uncoordinated, as well as lacking night vision equipment. The first ambush might just be a decoy to draw out and ambush a larger force. Saying yes might send them to their deaths. But saying no means perhaps letting those who killed their commander get away.

As the jets clear the airspace the helicopters approach. The German helicopters are double the size of a normal school bus. Their call sign is Nazgûl.

The pilots fly their aircraft completely blacked out and are guided by infrared strobes. One helicopter orbits the base as a gunship while the other lands and unloads a medical team before they both take off and fly off to a holding pattern.

A heated debate erupts in the base. The first reports have caused confusion and misunderstandings. The task of the medical team was to collect wounded Swedish soldiers, not Afghan police officers. Local forces are not the responsibility of the international forces but leaving without treating them would cause an uproar among the partnering forces.

The two wounded arrive back at the base. They have visible injuries on their legs, but it is impossible to tell if these were caused by gunshots or shrapnel. They have been given first aid but are still bleeding. The medical team begin to stabilize them. The last man is still sitting in the vehicle in the same position where he was shot. Death was immediate and probably merciful to him.

It is late in the night, almost morning before the helicopters fly out the wounded and a relative calm settle over the small outpost. With the first light of sunrise, the soldiers can for the first time see the bullet holes and where the detonations have scorched the sides of the vehicles. The pools of blood on the ground are still red but have begun to dry.

The research problem

The extreme context

Competent leaders are central to any organization that aims to improve organizational effectiveness, but they are especially important in military organizations (Ben-Shalom & Shamir, 2011). The context in which such organizations are required to function will often include components of friction, uncertainty, unpredictability and risk where leaders will have to cope with the situation and make decisions based on limited, ambiguous or even contradictory information (Baran & Scott, 2010; Marshall, 1947; Stouffer et al., 1949). It can also (and often will) include an opponent that will actively try to kill the leader and their subordinates, and where the leader in the reverse situation may have to overcome the psychological burden to kill another human being, or order subordinates to do so (Bandura, 2004; Bergman, 2016b; Hughbank & Grossman, 2013; Waaler, Nilsson, Larsson & Espevik, 2013). These settings are commonly referred to as extreme contexts, defined as those with "risks of severe physical, psychological or material consequences […] to organizational members or their constituents" (Hannah, Uhl-Bien, Avolio, & Cavarretta, 2009, p. 897).

The extreme context is the normal setting for leaders in numerous organizations like military, law enforcement, paramedics, fire-fighters, correctional services and other first responders that are required to function and lead others in specific situations which may result in physical harm, devastation or destruction. It is not to be confused with the more common concept of crisis leadership where any organization might be required to handle unexpected crises such as harassment, boycotts, strikes, extortion or hostile takeovers (Pearson & Clair, 1998). Even if crises like these pose serious problems in the workplace they seldom lead to injury or death for anyone involved (Klann, 2003). But the most important difference is that for crisis leaders the situation is something undesirable and unnatural while for leaders in extreme contexts it is a natural part of the profession.

Leading in extreme contexts

Leading in extreme contexts is most often more demanding than leading in more normal settings (Hannah et al., 2009; Osborn, Hunt & Jauch, 2002). Doing so is not a specific style of leadership like transformational or developmental leadership (Bass, 1985; Larsson et al., 2003). It is rather leadership in a specific context that will put greater demands on the leader.

Competent leadership is not the only contributing factor to success in combat, but arguably it is one of the most influential, which has been emphasized throughout the history of warfare. In one of the most comprehensive studies on fear and courage in military settings Shaffer (1947) ranked the fears of 4504 officers and enlisted men that had just endured combat. When meeting the enemy for the first time their primary fears were subjective ones such as failing the unit and being seen as a coward. Somewhat counter-intuitively, the fear of being killed or injured ranked a distant third and fourth. Confidence in one's crew and leaders were also the most frequent responses when asked about factors that assisted in courageous combat behavior. Similarly, in their study on why the German soldiers of the Wehrmacht continued to fight on even though the war had already been lost, Shils and Janowitz (1948) concluded that a soldier's ability to fight was dependent upon the function of the primary group (squad or section), and once vital functions like leadership were taken away the group disintegrated with little resistance. In the classical book *On the psychology of military incompetence* (Dixon, 1976), the assertion that contextual factors are what sometimes make military leaders fall short with catastrophic consequences is graphically elaborated:

> Military decisions are often made under conditions of enormous stress, when actual noise, fatigue, lack of sleep, poor food and grinding responsibility add their quotas to the ever present threat of total annihilation (p. 32)

Similarly, Moran (1967) asserts in his field study *Anatomy of courage* that the physical and psychological burden on a commander in battle is greater than can be described. He emphasizes the relation between officer and subordinate as vital, as well as the peacetime preparation of officers for wartime leadership, which he refers to as substituting external control with a belief in internal control. The historical findings are consistent with contemporary studies of humans in conflict, where the leader's abilities emerge as *the* most influential factor to maintain cohesion and succeed in combat settings (Sweeney, 2010; Sweeney, Thompson & Blanton, 2009).

Consequently, the leader is central in influencing subordinates to facilitate the collective efforts to accomplish the shared objective (Bass, 1985; Bass, 1996; Bass & Avolio, 1994, House et al., 1999; Yukl, 2002). This thesis will focus on a leadership model developed in a Nordic context - the developmental leadership model (Larsson et al., 2003). It is closely related to the transformational leadership model and describes the process of motivating and inspiring subordinates to accept the organization's goals as their own and perform beyond their perceived abilities in a way that improves both the individuals and the organization (Bass, 1999; 2008). When leaders act as exemplary models and also empower and motivate subordinates, they can increase the sense of belonging and secure a team-oriented vision (Bass, 2008; Baumeister & Leary, 1995; Burns, 1978). When leaders enhance followers' internalization of the organization's goals it can change those followers and their performance in a positive way (Hannah, Schaubroeck & Peng, 2016; Shin & Zhou, 2003; Judge & Piccolo, 2004). Hence the 'transformation' or 'development' implied by the names of the leadership models.

The contextual demands of the extreme situation will possibly affect leaders in several ways. Coping with potentially threatening situations is necessary for controlling efforts towards goal attainment in difficult conditions (Hockey, 1997). In the reverse case, leaders with poor cognitive and emotional control can possibly harm themselves and their followers by making ineffective decisions or no decision at all (Kolditz, 2007a, 2007b). Similarly, Gal and Jones (1995) argued that leaders who show strength and confidence will reduce levels of stress among their followers while at the same time increase their own confidence in performing in extreme contexts over time.

When facing more extreme contexts, followers have been shown to be more attentive to their leaders using a more transformational leadership style (Hannah et al. 2009; Hannah et al., 2016; Lim & Ployhart, 2004). In an extreme setting where life is at risk, no amount of formal authority is likely to command the respect and commitment of subordinates, and few contexts require a transformational leadership style as the extreme context (Kolditz, 2007b). The continuum model of impression formation shows that individuals tend to a greater extent to assess the behavior of individuals holding power over them when faced with an extreme threat (Dépret & Fiske, 1999; Fiske & Neuberg,

1990). The extreme context creates a classical outcome dependency (Berscheid, Graziano, Monson & Dermer, 1976; Clark & Wegener, 2008) where subordinates will to a greater extent seek to create accurate attributions of the leader's behaviors and intentions as well as how these will affect them. The extreme context accentuates the impact of transformational leadership while followers in conventional contexts are less attentive to such leader behaviors, thus diminishing their effects (Hannah et al., 2017).

Training for leading in extreme contexts

The characteristics of the extreme context create a paradox that becomes central in training leaders that are required to function in such settings: for practical and ethical reasons it is impossible to expose individuals to real combat to better prepare them for that situation, yet combat is where the individual is required to function, making the context normative for training. It is simply not possible or ethically permissible to expose individuals to the extreme stress and inherent dangers of a real combat situation during peacetime.

Because of the gap that the training paradox presents, military organizations around the world have always faced an inherent problem in how to train future leaders for a context that they cannot expose them to (Shalit, 1982; 1985). The primary way to narrow that gap has been to utilize training courses that expose individuals to extreme conditions but within a controlled environment (Meichenbaum, 1985; 2007; McCormick, Meijen, Anstiss & Massey, 2019). One common form of such activity is the parachute training situation (Aran, 1974; Boe & Hagen, 2015; Samuels, Foster, & Lindsay, 2010; Shalit, Carlstedt, Ståhlberg-Carlstedt, & Täljedal-Shalit, 1986; Taverniers et al., 2011). Parachuting can be an effective tool for developing leaders since it is an activity native to the military that shares common attributes with combat, which increases the likelihood that the personal beliefs transfer to leader abilities (Samuels et al., 2010). It presents an intense experience where subjects are exposed to stress, anxiety and fear (Epstein & Fenz, 1962, 1965; Fenz & Epstein, 1968) and a situation where the perceived threat to life is as realistic as possible within ethical limits (Ursin, Baade & Weinberg, 1978). Such training can make individuals better able to cope with stress in both the parachute training situation as well as in other challenging situations. (Basowitz, Persky, Korchin & Grinker, 1955; Shalit et al., 1986). When individuals can successfully master a stressful situation with a positive outcome, they establish an expectancy of being able to handle subsequent stressful situations with a positive result (Ursin & Eriksen, 2004; 2010). The mastery experience can increase the individual's belief in their own abilities – the individual's self-efficacy – and the belief that other tasks with similar or even greater difficulty can be overcome similarly (Bandura, 1977; 1997). As such, self-efficacy has been argued to be the central mechanism for preparing individuals for leading in combat (Samuels et al., 2010). Self-efficacy is a central concept to the present

thesis which represents "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances. It is concerned not with the skills one has but with judgments of what one can do with whatever skills one possesses" (Bandura, 1997, p. 391).

Specifically, parachute training presents a situation where the individual will have to remain calm (i.e., not panicking or freezing) as well as make correct and timely decisions in executing active points of performance (i.e., perform the right procedures in the air) in order to successfully master and land the parachute (Bazowitz et al., 1955; McMillan & Rachmann, 1988). Thus, the central mechanisms are the ability to retain composure and cognitive functioning despite severe stress (self-control) and the ability to make and execute correct decisions (assertiveness). How individuals motivate themselves when facing difficulties, and the choices they make when motivating others have been argued to be central to the development of self-efficacy (Bandura & Locke, 2003; Hannah et al., 2008; Parry, 1998). Similarly, Kolditz (2007a) asserts that key aspects of successful performance in contexts like combat are the cognitive and emotional ability to retain control and the ability to make decisions. Parachuting, like combat, is an unforgiving environment where success rests only on the individual's ability to retain composure and make correct decisions, and where the strong mastery experience can create the necessary environment for transfer of beliefs between the two activities (Samuels et al., 2010). But it is also unforgiving in the sense that not all individuals will have the ability to handle the inherent feelings of anxiety and stress, an ability that is necessary in order to successfully complete the training (Endler, Crooks, & Parker, 1992; Fenz & Jones, 1972; 1974). Although previous research on the parachute training situation has presented a 5-10% attrition rate (e.g., Basowitz et al. 1955; Samuels et al. 2010) it is not clear how non-completion will affect the individuals who are unable to complete.

Swedish training for leading in extreme contexts

The cadets at the Swedish Military Academy undergo a three-year officer training program to graduate and become commissioned officers in the army, navy or air force. Uniformed professions such as the military and law enforcement are relatively closed systems that use single points of entry and limited external recruitment, and individuals change employer more rarely during their career than in other professions (Sanders, 2008). Employment and commissioning as an officer in the Swedish armed forces also require graduation from the Military academy by law (SFS 2017:1268), making it the primary place for preparing future officers to lead in extreme contexts. Aside from theoretical classes on leadership, the Military Academy places a strong emphasis on personal development in this regard. Historically, one of the most consistent elements of this ranging back more than 60 years is that of the parachute training course (Bergman, 2016a).

The assumption that military parachute training situation will make future military officers better leaders is one that raises two central questions: Does the training given improve leadership in the way we think it does, and do those effects then transfer to actual leadership performance? Since its conception, the parachute training situation has been used as a method for self-improvement based more on a notion that an effect exists rather than concrete knowledge of exactly what that effect is (Bergman, 2016a).

The aim of the thesis

The overall aim of this thesis is to investigate whether and how military parachute training can function as a method for leadership development. The overall aim is comprised of several specific aims described in detail below and visualized in Figure 1.

The first aim is to investigate whether successful completion of a static line parachuting course is associated with leadership self-efficacy in the sub-domains of leader self-control efficacy and leader assertiveness efficacy. How individuals motivate themselves when facing difficulties, and the choices they make when motivating others have been argued to be central to leadership self-efficacy (Bandura & Locke, 2003). Because of this, the aim is to examine whether successful completion of the parachute training course could lead to stronger beliefs in the sub-components of leader self-control efficacy (to maintain cognitive and emotional control) and leader assertiveness efficacy (the ability to make immediate and technically correct decisions when leading others).

The second aim is to investigate whether the inability to complete parachute training is associated with not only the absence of positive effects, but any direct and sustained negative effects on leadership self-efficacy. Because the possible positive effects of leadership self-efficacy rely on the individual coping with the situation of parachuting, it is possible that individuals who are unable to do so could be related to not only the absence of the positive effects but also possibly to direct and sustained negative effects (Ursin & Eriksen, 2004; 2010). The aim also include investigating whether the psychological factors of stress, anxiety and the individual's level of collective identity with the organization have any connection to the ability or inability to complete parachute training.

The third aim is to investigate the associations between leadership self-efficacy and the different facets of the developmental leadership model (Larsson et al. 2003) as indicated by individuals' ratings of their own leadership. Although self-efficacy will generally lead to higher performance in that domain (Sadri & Robertson, 1993; Stajkovic & Luthans, 1998), a belief in one's leadership ability does not necessarily lead to specific behaviors when one is put

in a leadership position. Even if transformational leadership has been associated with both individual and collective performance (Lim & Ployhart, 2004; Sweeney et al., 2009), every leadership model such as transformational and developmental leadership (Bass, 2008; Larsson et al., 2003) consists of different facets of behavior (i.e., exemplary model, individualized consideration, inspiration and motivation). With two sub-components of self-efficacy and several facets of the leadership model it is essential to investigate specifically how leadership self-efficacy is related to the developmental leadership model (Larsson et al., 2003).

Figure 1 visualises the hypothesis for each respective study in relation to the parachute training situation. Study I investigates the possible increases in leadership self-efficacy due to successful completion, Study II the possible negative effects associated with inability to complete the same training and finally Study III the association between self-efficacy and the developmental leadership model.

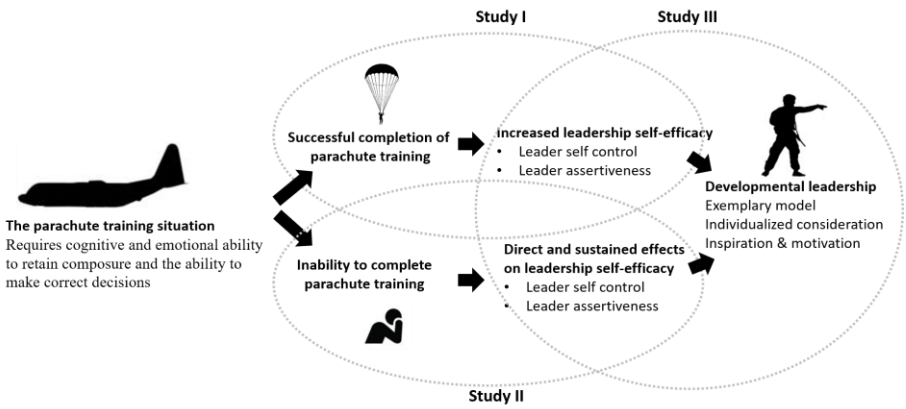

Figure 1: Overview of the thesis

The parachute training situation

Parachuting

Parachuting is the jump from an aircraft with a controlled vertical descent to earth by means of a canopy of cloth which increases air resistance and slows the body in motion. The word is composed of the French word *chute* (to fall) and the Latin prefix *para* (to defend/shield). The parachute was introduced on a large scale in military applications during the Second World War, following the introduction of airplanes. Since then, military parachute training has been used for two primary purposes. The first is as a method of insertion of troops behind enemy lines (Nordyke, 2005, Weeks, 1978). The second is as a method for personal development for future officers (Aran, 1974; Boe & Hagen, 2015; Samuels et al., 2010; Shalit et al., 1986; Taverniers et al., 2011). In 1952, the Swedish armed forces introduced paratroopers into the army and in 1956 parachute training was introduced as a method for leadership development to the cadets at the Military academy (Arméns fallskärmsjägarskola, 1992; Bergman, 2016a; Kernell, 1997).

Today, two types of parachuting exist for both purposes described above. The first is the traditional method referred to as static line, where the jumper attaches the parachute deployment mechanism to a cable in the aircraft (a line that is static) which then automatically opens a round non-steerable parachute when the jumper exits the aircraft at a low altitude (usually about 300-500 m). The static line method is the original method used since the second world war, and because it is easy and very safe it is generally used to deliver large numbers of troops to the battlefield (Weeks, 1978). The static line method is also the one used for leadership development in the present dissertation. The second method is referred to as freefall, where the jumper exits the aircraft from a high altitude (usually 2,000 – 4,000 m) and falls unobstructed through the air (free falling) and manually deploys a steerable parachute shaped like a wing that enables flying and precision landings. The freefall method requires more active points of performance (i.e., a stable body position, check of altitude and heading as well as manually deploying the parachute). This is the method used in civilian skydiving as well as for inserting smaller military units

(i.e., special forces, reconnaissance units, pathfinder units) behind enemy lines. It is also the version used for Haho/Halo-jumps (high altitude high opening/high altitude low-opening) where the jumper jumps with oxygen-equipment above the level of breathable atmosphere (usually between 4,000 to and exceeding 10,000 m). A visualization of the static line and freefall methods of parachuting is presented below.

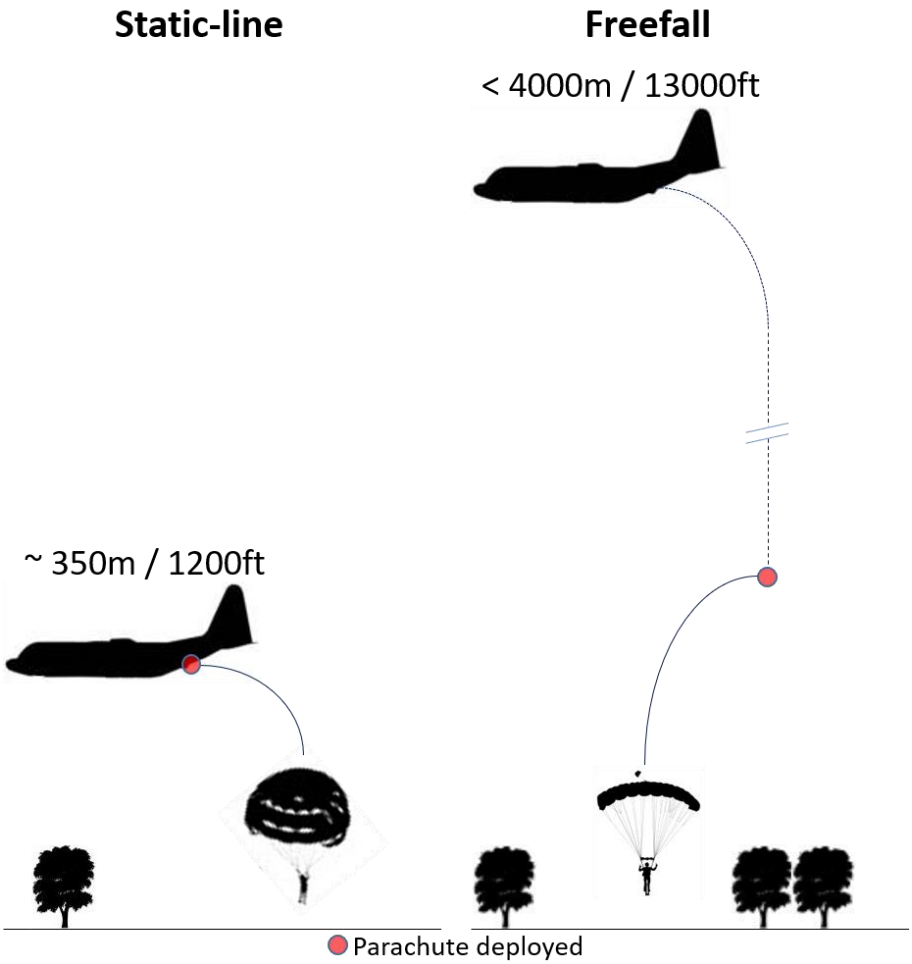

Figure 2: Overview of the static line and freefall parachute techniques

All human behavior exists in an interaction between the individual and the situational context, and participation in parachute training is no exception. The individuals who undertake such training are all selected (cadets volunteer for the Military academy and are subject to a physical and psychological selection process before admission) and represent a restricted range of an observed sample. Those who aspire to and succeed in extreme military training are also often highly competitive individuals (Frueh et al., 2020) which can contribute

to organizational cultures that put a premium on success and winning, and where failure can be regarded with contempt, even in peacetime training (Soeters & Boer, 2000). The context of military parachute training is a limited period of intense instruction where the individual is progressively introduced to the different elements of parachuting, which are then gradually added in more complex drills, and repeated meticulously. Such training is usually conducted at a high pace, even for military settings and the method of drill is used to create "overlearned patterns of response" (Basowitz et al., 1955, p. 26). Such automatic performance has been argued to facilitate the development and activation of the coping strategies necessary for successful performance. The course culminates with performing parachute jumps from an aircraft and the awarding of wings to wear on the uniform, symbolizing successful completion.

Parachuting (like combat) is an unforgiving activity where individuals can die. When talking about the "potential threat to life" of the extreme context it is not to be taken merely as a contrasting factor for academic comparison or a mere hypothetical outcome. The fatality rate in Swedish civilian skydiving is 0.8 per 100,000 jumps (Westman, 2009) and the incidence rates in the United States are similar with 0.5 deaths per 100,000 jumps (Peyron, Margueritte, & Baccino, 2018). Military static line parachuting is generally safer (being highly automated) with fewer fatalities but has a higher incidence rate of back and/or leg injuries (Bricknell & Craig, 1999). The only known fatalities in the Swedish military parachute training were two paratroopers who died by drowning in 1958 after jumping over a lake.[1] In summary, the risks of serious injury or death are extremely low, but still exist. But from another perspective, an activity that was 100% safe would probably not cause the required stress response necessary for the personal development discussed in this thesis and would be unsuitable for this type of training.

The stress and anxiety of parachuting

Jumping from an aircraft is an intense experience for almost all individuals, often described as one of the most frightening and most exhilarating experiences of their life. Despite the logical knowledge that a parachute will slow their descent, jumping from above survivable altitude defies the human survival instinct. The situation creates a "real or at least potential threat to life for which the subjects were unprepared by past experiences" (Basowitz, et al., 1955 p. 23). In mastering the situation, individuals will have to overcome inherent feelings of stress and anxiety (Fenz, 1964; 1975). Since parachuting is

[1] Two additional military jumpers have died but did so while conducting civilian skydiving, and are included in the civilian statistics presented in the dissertation *Dangers in sport parachuting* by Westman (2009).

such an intense experience but also one where rigorous safety protocols are in place, it presents a setting in which fear is as realistic as possible and which involves "real danger but still within ethical limits" (Ursin et al. 1978, p. 14).

From a scientific standpoint the parachute training situation has been pointed out as an ideal situation for studying stress since it combines the intense involvement and "high threat to life usually found only in field studies with the stringent controls that can be obtained only in the laboratory" (Fenz, 1975, p. 305). It is also historically and nationally consistent in its methods, and relatively "clean" of confounding variables because of the isolated training setting. Training is conducted at a high-tempo and long days reduces or eliminates external variables or other sources of stress during the period of training (Ursin et al., 1978).

Historically the psychological aspects of the parachute training situation have been examined in a number of studies. The most comprehensive and most relevant to the present thesis have been summarized with regard to their primary focus and findings and are presented in Table 1. All the studies relate to different aspects of the parachute training situation. The participants of the studies were both military paratroopers (paratroopers) and future military officers (cadets) as well as civilians conducting recreational parachuting (skydivers).

The study by Samuels et al. (2010) mentioned in Table 1 was a starting point for the present thesis and one of the few directed at leadership and self-improvement at a military academy that were similar to the conditions in Sweden. It was also the only one that used the self-efficacy framework. Samuels primary finding was that parachute training led to an increase in leadership self-efficacy when participants rated themselves before and after the course. For the third follow-up measurement conducted nine months later, two additional groups were included, one who had undertaken soaring-training (flying glider aircraft) and another who had undertaken none of those voluntary courses. In the follow-up measurement the group that had undertaken parachute training rated their self-efficacy higher than those who had undertaken soaring-training or no training at all, although all three groups indicated lower self-efficacy in the follow up than in the first two measurements of the parachute group. Thus, a methodological concern was the absence of a comparison group parallel to the one undertaking parachute training. A secondary issue was that the style was freefall parachuting, not the static line parachuting more common in military training.

Table 1: *Summary of the more comprehensive studies on the parachute training situation with regard to stress, anxiety, coping and leadership.*

Study	Participants	Primary focus and findings
Basowitz et al., 1955	N = 750 US Army paratroopers	Mixed design. Quantitative study of biochemical stress responses, self-ratings, qualitative interviews & case studies. Found changes in reactions of stress and anxiety during various stages of parachute training.
Fenz & Epstein, 1962-75 (10 separate studies)	N = 16 to 32 US skydivers	Quantitative studies of physiological responses of stress and self-ratings of fear. Found an inverted V-form of responses as a function of experience. Novice jumpers experienced peak in arousal at the time of the jump. The more experienced the jumpers were the earlier they experienced the peak arousal.
Ursin et al., 1978	N = 72 Norwegian paratroopers	Quantitative study of physiological responses during training. Coping is defined as a positive response outcome expectancy and dependent of what the subject learns about their own abilities to handle the specific situation. Laid foundation for the Cognitive Activation Theory of Stress (CATS).
Johnsen, 1995	N = 692 Norwegian skydivers	Quantitative study using several inventories for personality. Examined whether there was personality-traits of "the right stuff" more suitable for extreme activities. Found *some* differences but mainly concluded that those succesful were primarily ordinary people with an unordinary motivation to master and succeed.
Kolditz, 2007a	N = 70 US Army cadets	Qualitative interviews and participant observations focusing on the relationship between parachuting and in-extremis leadership. Found parachuting to be suitable for both development of individual qualities related to leadership in such context as well as developing high-performance teams.
Samuels et al., 2010	N = 126 US Air Force cadets	Quantitative study of the development of leadership self-efficacy. Found that cadets who conpleted parachute-training scored higher also in domains central to leadership than cadets who undertook different training or no training at all.

The context of the parachute training situation seems to affect all individuals and in similar ways. One of the first (and to date the most comprehensive) systematic studies of the individual reactions to parachute training at the United States Army Airborne School at Fort Benning was performed by Harold Basowitz, Harold Persky, Sheldon Korchin and Roy Grinker (1955) in their book *Anxiety and Stress – An Interdisciplinary Study of a Life Situation*. Their main finding was that under the severe physical stress that the parachute training situation presented, all individuals showed high levels of stress and anxiety. Although the study presents a large sample and the general findings of changes in physiological stress responses are clear, the main limitation in their research was that the pattern of response was not connected further to what exactly led to differences in coping or coping strategies. The studies by Walter Fenz and Seymour Epstein show the stress reaction to be a function of experience (Fenz, 1975). Novice skydivers experienced increased fear and stress on a steadily increasing curve leading up to, and culminating, with the jump from the aircraft. Meanwhile, for experienced parachutists the peak experience in reactivity took the form of an inverted v-form which became displaced toward the earlier part of the jump and which then decreased to nearly normal levels in closer proximity to the jump as a function of experience. These results were consistent in both longitudinal and cross-sectional studies (Fenz, 1968), and corresponded with ratings of fear as a function of time (Epstein & Fenz, 1965) and when measured as physiological reactions during ascent in the aircraft (Fenz & Epstein, 1967). Although an analysis comparing three points of measurement with a peak will by default created an inverted "v", the data did not support a single point of immediate decrease in stress response that "v" suggests, and arguably an inverted u-form analogy would have been better suited. In addition, these studies were all experimental, using volunteers and had a small sample size, raising the question of a possible selection bias. In other words, those continuing to become more experienced jumpers might simply be those best suited to cope with such situations. Nevertheless, the previous studies are unanimous in finding that the parachute training situation is a setting where individuals will experience significant levels of stress and anxiety that they will have to successfully cope with.

Coping with the stress and anxiety of parachuting

Although all individuals will be affected by the parachuting training situation, most also seem to possess the ability to successfully master it. The ways individuals learn to manage the situation are commonly referred to as coping. Coping is the individual's effort to minimize stress and conflict and master the situation. Coping occurs when individuals believe that most responses will lead to a positive result, which in turns reduces stress (Ursin & Eriksen, 2010). This is consistent with classical views of coping as adaptable thoughts and

actions that solve problems and thereby reduce stress (Lazarus & Folkman, 1984; 1991)

Just like the stress response, coping is something that is common for all individuals, although the way and time to reach such a state might vary. Basowitz et al. (1955) found that just as all individuals experienced heightened levels of stress and anxiety, most individuals subsequently found a way to handle the situation. What differed was usually that they did so at varying stages during the training course, although they offered no explanation as to exactly what facilitated such coping. Basowitz et al. (1955) studied paratrooper trainees, who are highly selected even within military settings, and represent a restricted range of observed sample. But similar results have been found in samples with greater variation in civilian skydiving as well (Johnsen, 1995). Jens-Henrik Johnsen was a Norwegian skydiver who, influenced by the personality research on the first astronauts, tried to determine if there were individuals made of "The right stuff" (Wolfe, 1979). Are there psychological traits that simply make some individuals more suitable for high-risk activities such as skydiving? Despite his efforts, he concluded that almost everyone tested had the ability to perform parachute jumps, and that those who became successful simply seemed to be ordinary people with an unusual motivation to master and succeed in what they do. In a cruel twist of fate Johnsen died in a parachute accident in March of 1992, just as he was about to turn in his doctoral dissertation on parachuting at the Norwegian School of Sport Sciences (Norges idrettshøgskole) in Oslo in the autumn of the same year. It was subsequently released by his tutor in 1995 (Johnsen, 1995).

The word 'coping' is not specifically used in the earlier studies on the subject (i.e., Basowitz et al.,1955; Fenz, 1975). This is not that surprising since the concept as we know it today was not utilized at the time. Despite this, a trend suggesting such a phenomenon is evident in the data. Basowitz et al. (1955) noted that the pattern of changes in cognitive and physiological responses gradually decreased during varying stages of training for different individuals. Similarly, Fenz and Epstein (Epstein 1967; Fenz 1964; 1969) described the parachute training situation as a classical psychological approach/avoidance-rationale that has both positive and negative effects. When confronted with the situation the individual develops a gradient of stress and anxiety and a gradient in inhibition of that stress and anxiety. When the individual learns to handle the situation with repeated successful exposure the inhibition of the anxiety has a steeper gradient than anxiety itself, causing a reduction in stress and anxiety and an increase in functioning. In one word, 'coping'.

The earlier studies have also described the process of coping primarily through the reduction in physiological stress responses, but with time the concept has developed to encompass the individuals' beliefs in their abilities. The lowering of stress responses comes as a function of individuals being convinced they can handle the situation with a positive result. In the study by

Ursin et al. (1978) they concluded that it was primarily the subjective feeling of being able to perform that reduced the stress response. Their findings from laboratory research (Coover, Ursin & Levine, 1974; Davis, Memmott, Macfadden & Levine, 1976; Davis et al., 1977) led up to the parachutist study on a class from the Norwegian Army Parachute Training School that is described in the book *Psychobiology of Stress – A Study of Coping Men* (1978). Coping is initially explained as "When my stomach does not hurt" by Levine (in Ursin et al., 1978). The research was subsequently developed into the *Cognitive Activation Theory of Stress* or just CATS (Ursin, 1988; 2009; Ursin & Eriksen, 2004; 2010). There, coping is defined as "positive response outcome expectancies", meaning that the individual has established the expectancy of being able to handle the situation with a positive result (Ursin & Eriksen, 2010, p. 879). Thus, the individuals' beliefs in their abilities become central to handling an extreme situation with a positive result.

Leadership and parachuting

Since the formation of parachute units, the parachute jump itself has been closely connected to leadership and the practice that the leader is the first person to jump from the aircraft. This practice is today established as an unwritten international standard and has since formed the *Follow me*-analogy common to military parachuting.[2] Early commanders like James Gavin argued that parachuting places a certain strain on individuals and was in the beginning perhaps the most vocal spokesperson for the practice that the officer should always be the first person out of the door (Gavin, 1947; 1958; 1978). His view on leadership following this practice has been best summarized by his subordinates in that a leader is "the first man out of the airplane and the last man in the chow line" (cited in Nordyke, 2005, p. 17). The *Follow me* principle of leading by example has also evolved as an international standard (Dayan, 1976; Gal, 1986).

The *Follow me* analogy has two elements. First the notion that parachuting is sometimes as frightening as combat, and to inspire and motivate subordinates the officer must be the first man out, leading by example for others to follow. The practice means that everyone who is about to jump knows that someone has just done so before them, which helps them overcome the fears associated with jumping (Lofaro, 2011). The reasoning is closely related to

[2] The tradition that the highest-ranking officer is the first to jump rests more on institutional knowledge than written law. The historical jump-logs from the parachute school confirm the practice. When the parachute ranger school was founded in 1952, its commander Nils-Ivar Carlborg was the first to jump. When parachute training was introduced to cadets at the Military Academy in 1956 their company commander Nils Engelhart was first out of the airplane. In 1994 when supreme commander Owe Wiktorin visited the parachute training school the four-star general was the first officer out of the door.

the psychological development of beliefs related to our own competence where vicarious experiences of seeing people similar to us succeed by concentration and sustained effort raises our beliefs that we too possess the ability to master the same activities (Bandura, 1997). Secondly that more extreme conditions place a premium on commanders having close individual consideration for their subordinates, hence the analogy of eating last (Nordyke, 2005). The "first man out/leaders eat last" practice has with time become a general analogy for leading by example in military as well as civilian settings (e.g., Sinek, 2014).

The connection between the parachute training situation and leading in combat has been argued to exist at both an individual and organizational level. From an individual leader perspective, parachuting can promote authenticity and character in leaders. Kolditz (2007b) argues that leaders taking more than equal risks by jumping first out of the airplane or placing themselves in the lead vehicle should not be seen as merely symbolic acts or gimmicks to score quick popularity points, but as "authentic elements of the individual's character and the leader-follower relationship" (p. 171). Parachuting has been shown to be a promising tool for developing the personal requisites for leading in combat since the demands on the individual are similar and learning to cope with danger in one context will facilitate personal development in a positive way (Kolditz, 2007a). Similar reasoning can be found in the developmental leadership model where the capability to cope with stress is emphasized as a fundament for successful leadership (Larsson et al. 2003). On an organizational level, the parachute training situation is argued to be a prominent place to directly build teams required to function in extreme settings since it is "tailored to the unforgiving elements" (Kolditz, 2007a, p.161). Characteristics such as authenticity, shared risk with followers and a common lifestyle can be seen as a breeding ground for a high-performance leaders and high-performance teams. The research builds upon participant observations in actual combat settings (Wong, Kolditz, Millen & Potter, 2003; Kolditz, 2006) and shows how the parachute training situation can be a prominent tool for preparing leaders and teams for such situations (Kolditz, 2007a; 2007b). In Sweden, it was the founder of the parachute ranger training school who later, as commander of the Military academy, introduced both mandatory parachute training and the subject of leadership to the officer training curriculum in the 1960s (Andersson, 2001).

The inability to complete parachute training

Occurrence of non-completers

Previous studies have usually made an implicit assumption that successful completion is the outcome when individuals participate in parachute training. But although most individuals may possess the ability to perform jumps from an aircraft, the parachute training situation still represents an intense and unforgiving activity that individuals will have to master within the curriculum of a given course, in a specific social setting during a narrow timeframe. Consequently, not all individuals will be able to complete the training. Despite this, no known systematic review has to date been conducted on those unable to complete parachute training. When rates of non-completers have been reported it is most often to define the sample in the statistical analysis of the positive main effects on those who completed training. A summary of the rate of non-completers from previous studies on the parachute training situation can be seen in Table 2. The rates of non-completion are generally below 10 percent.[3] All studies have in some way referred to and exemplified that cases of non-completers exist but have not always offered any data as to numbers.

[3] The high rate of attrition of Ursin et al. (1978) is because parachute training was combined with the initial selection period for paratroopers in the Norwegian army, designed specifically to make individuals quit. The low validity and toxicity of this "selection by attrition" method have been described in the related field of selection and training of fighter pilots (Carlstedt, 1979; Sandahl, 1981; 1988).

Table 2: *Rate of non-completers for each respective study*

Study	Participants	Non-completers	%
Basowitz et al., 1955	N = 750 US Army paratroopers	67	8.9
Fenz & Epstein, 1962-75 (10 separate studies)	N = 16 to 32 US skydivers	Unknown	
Ursin et al., 1978	N = 72 Norwegian paratroopers	28	38.9
Johnsen, 1995	N = 692 Norwegian skydivers	Unknown	
Kolditz, 2007	N = 70 US Army cadets	Unknown	
Samuels et al., 2010	N = 126 US Air Force cadets	8	6.3

Individual factors

Non-completion can occur for several reasons. On the individual level, the inability to complete parachute training could simply be an effect of individual differences (e.g., medical, physiological, cognitive). The stress response often involve complex cognitive evaluations of situations and their potential consequences (Ursin & Eriksen, 2010). This could mean that the individual's general cognitive ability is a factor that can possibly affect the ability to handle stressful situations with a positive outcome. Similarly, defense mechanisms – like coping strategies – could also determine individuals' ways of dealing with adversity in that a high activation of defense mechanisms inhibit coping (Cramer, 1998).

Empirical studies on individual differences between completers and non-completers are inconclusive, and sometimes even contradictory. For example, Ursin et al. (1978) noted that that those who completed training scored significantly higher in intelligence and lower in masculine role taking as well as sensation-seeking. In contrast, Basowitz et al. (1955) found that individuals who were unable to complete training were the ones who scored highest on intelligence. When Værnes (1982) tested the Defense Mechanism Test on Norwegian paratrooper trainees he found significant results for the reaction formation variable on those unable to complete the jump, although the rest of the results of the DMT test showed no variations. Honestly, these are all relatively small differences that are in some cases outright contradictory. It is hard to argue that any of them could have a significant impact on an individual's

successful completion. Furthermore, in a broader perspective it is important to emphasize that most variables tested in the above-mentioned studies did *not* differentiate between the groups of completers and non-completers, raising a warning flag about spurious correlations. If a large enough number of variables are tested post-hoc then eventually some of them will show a significant difference, but not necessarily one relevant to the study. Both Basowitz et al. (1955) and Ursin et al. (1978) warned explicitly that the sample sizes in their studies were too small for any detailed analysis. Basowitz et al. (1955) summarized that regardless of the individual reasons for completing training or not they simply "did not imply as much psychological differences as one might have anticipated in advance" (p. 82).

Non-completion could also be related to the process of coping and the individual's self-perception. If the levels of stress and anxiety are too high, they take precedence and impede the individuals' capacity to develop the coping strategies required to deal with them (Ursin & Eriksen, 2004; 2010). Similarly, an underestimation of the situational demand and an excessively low stress response can hamper the development or activation of the coping strategies necessary for goal attainment.

Both the experience and inhibition of stress can be central to the coping process and goal attainment in dangerous situations (Hockey, 1997). In previous studies on parachutists, excessively high levels have shown to impede the development of individual coping strategies necessary to master the situation (Endler, Crooks & Parker, 1992; Fenz & Jones, 1972; 1974). Excessively high levels of stress in the initial stage when individuals appraise the situation can lead to a shift in inhibitory control that can redirect focus and effort away from the task (Dorenkamp & Vik, 2018; Eysenck, Derakshan, Santos, & Calvo, 2007). In the same way, if the stress experience is not strong enough it can impede the development of coping mechanisms similarly. Johnsen (1995) labeled this as the "over-confident" individuals, in describing those underestimating the situational demands of an extreme situation and overestimating the personal resources available to meet those demands. In this way, overconfident individuals did not activate the necessary coping mechanisms. Thus, nervousness and uneasiness should not be seen as bad but merely as normal signs of a correct appraisal of the situational demands and the activation of necessary coping mechanisms.

In the subsequent stage of coping with the stressful situation, individuals can still fall short if the selected coping strategies prove ineffective for meeting the task at hand. When individuals are faced with a fearful situation, regardless of how simple, there will still be a rich variety of coping strategies that will at least in some part be dependent on antecedent conditions and a complex interaction among individuals in the group (Ursin et al., 1978). Fenz (1975) described this breakdown in coping mechanisms as a "too calm" phenomenon that manifests as a gradual reduction leading to a near total absence

in stress response. This is not to be confused with the earlier mentioned inverted v-form that reduces stress as an effect of experience and functioning coping mechanisms; it is something that completely removes stress as an effect of a breakdown of the same coping mechanisms. Similarly, Basowitz et al. (1955) reported the paradoxical results that those unable to continue training actually showed a *lower* stress response than the more successful trainees, where those who would refuse to jump showed a gradual passive reduction in autonomic responding. They admitted that "differences were small and insignificant but entirely in the opposite direction from what one might expect" (p. 82). It is likely that these individuals indeed experienced greater stress and anxiety earlier in the training cycle, but on coming closer to the actual jump the demands became too great, resulting in a breakdown of coping mechanisms and the reduction of stress and anxiety. Ursin & Eriksen (2004; 2010) argue that a negative outcome expectancy can hamper performance in the same way that coping can enable it. They identified that when the individual experiences hopelessness (no way to affect the situation) or helplessness (there are ways to affect the situation but all lead to a negative result) they will generally gradually withdraw from the situation since no action will lead to the desired result. With a breakdown in coping mechanisms, individuals will no longer experience stress and anxiety about a parachute jump they no longer expect to make.

Organizational factors

Non-completion could also be related to organizational factors. Cohesion in military units has historically been stronger than in other groups, and highly cohesive groups also add peer pressure. Excessively high social pressure could redirect focus and effort away from the task, causing a shift in inhibitory control (Eysenck et al., 2007). Possible signs of this were found in previous research. Basowitz et al. (1955) emphasized the overall intensity of stress caused by peer pressure and "the threat of failure and not achieving the desired wings" (p. 24). In other words, individuals are more worried about social exclusion or reduced social status than they are of performing the parachute jump. Such reasoning is supported by the rating of fears in extreme settings from previous research (Shaffer, 1947).

The same factors could also cause a shift in activation of coping strategies aimed toward maintaining one's self-perceptions or position in the group rather than toward performing the parachute jump. If non-completion is seen as a possibility, the individual will sometimes try to protect the self from adverse consequences. Using specific coping techniques in order to protect one's self-perception and social position can manifest as external attribution and self-handicapping (Martin, Marsh & Debus, 2001; Rhodevalt & Davison, 1986; Rhodewalt & Fairfield, 1991). For example, to attribute external causes and

exaggerate (or even aggravate) a "bad knee" instead of admitting a shortcoming in ability to oneself or others. Attributing medical symptoms (being beyond the individual's control) can be a more socially acceptable reason for non-completion than inability to meet the required standards (being completely and only under the individual's control) (Bergman, 2019). The training setting offers an obvious and natural predisposition toward such a shift in coping and self-handicapping. Parachute training is physically demanding and it is normal to experience somatic symptoms such as fatigue, bruises, abrasions and soreness during the course. In this regard it not unusual that individuals will try to seek a medical discharge as a socially acceptable excuse, at least in part to be allowed to save face in front of peers (Basowitz et al., 1955). This activation of coping mechanisms aimed at maintaining social status can be seen in previous research:

> The medical officer also collaborated with the men and the instructors; some of his exclusions may not have been purely medical but could at least in part represent a 'face-saving'. He also tended to give medical assistance and avoid exclusions if the man wanted very strongly to go training in spite of minor medical problems. (Ursin et al., 1978, p. 32)

As noted by Ursin et al. (1978) in the quote above it is equally common that individuals will try to use minor somatic symptoms as an excuse for non-completion as it is for highly motivated individuals to sometimes try to hide or diminish more serious injuries or seek medical treatment to reduce symptoms in order to be able to continue and complete the training with their peers.

Effects of non-completion

The possible negative effects of non-completion of parachuting represent an area that has been given little attention in previous research. The positive effects of completing parachute training that have been discussed somewhat simplified rests on the individual coping with the training situation and the positive beliefs in their abilities associated with that accomplishment. Using the same rationale, it is possible that the inability to cope with the situation can also have effects on the individual's belief in their own abilities.

Coping has been described as dependent on what the individual learns about their own abilities to handle the specific situation (Ursin & Eriksen, 2004; 2010). As such it is natural to assume that if successful mastery does not occur then the individual's beliefs in their own ability will reflect the outcome. Specifically concerning the parachute training situation, Kepecs (1944) pointed out a possible negative effect of not completing parachute training, namely being labeled substandard in the group of soldiers, thereby lowering the individuals' belief in their own abilities as well as reducing their social status. In the selected case-studies of non-completers Fenz (1975) stated that

the inability to perform was sustained at subsequent follow-up counseling but did not offer any specific information. Although it sounds intuitive that the inability to perform parachute jumps could have possible negative consequences just as successful performance could have positive effects, very little support exists for this from previous research.

Self-efficacy

Despite having the same physical abilities and the same amount of training, individuals can still behave differently, whether in everyday situations or extreme contexts like jumping out of airplanes or leading in combat. One explanation for this is that the individuals' actions in a specific situation are not only related to their ability but also to their belief in that ability. In this respect, one of the main frameworks to describe the individuals' perceptions of their abilities is that of self-efficacy.

Self-efficacy is defined as the individuals' "judgments of their capabilities to organize and execute courses of action required to attain designated types of performances. It is concerned not with the skills one has but with judgments of what one can do with whatever skills one possesses." (Bandura 1986, p. 391). The concept is a part of the social cognitive theory (Bandura, 2012) and the definition is centered around the events over which individuals exercise personal control including their motivation, thought processes, affective states and actions in doing so:

> Such beliefs (self-efficacy) influence the courses of action people choose to pursue, how much effort they put forth in given endeavors, how long they will persevere in the face of obstacles and failures, their resilience to adversity, whether their thought patterns are self-hindering or self-aiding, how much stress and depression they experience in coping with taxing environmental demands, and the level of accomplishment they realize. (Bandura, 1997, p. 3)

Self-efficacy is a theoretical framework used in numerous areas, but it began in research on snake-phobia. The patients were those who had a phobic (exaggerated and debilitating) fear of snakes. Although knowing rationally that a boa constrictor did not have any poison or nearly enough strength to kill them the subjects were still unable to handle, hold or even touch one. The obstacle was entirely psychological in nature. The situation was in many ways similar to the present research on the parachute training situation in that it presented a perceived threat to life which required active mastery. In an exposure treatment program that operated through direct mastery experiences the subjects were assisted to engage in more and more threatening interactions until they reached the point where they could hold and handle the boa constrictor (Bandura, 1977). It was found that self-efficacy could function in a cyclic manner.

Through mastery experiences the individual experiences reductions in defensive behavior as well as increased belief in the ability to perform which affect their behavior in a positive way; by successful accomplishment the efficacy beliefs are reinforced and the positive cycle begins again.

Self-efficacy should not be confused with more everyday concepts such as self-esteem, which is most often centered around the degree of self-worth that individuals ascribe to themselves (Marsh, 1993). Since concepts such as self-esteem are mainly centered around the individual's general perception of themselves as worthy, they often fail to contribute to specific behavior (Stanley & Murphy, 1997). In contrast, self-efficacy has been described as a "can do" cognition that mirrors a sense of control over one's environment by taking adaptive action (Scholz, Doña, Sud & Schwarzer, 2002). Feeling good about oneself is certainly a good thing but has arguably little effect on specific behaviors like handling a boa constrictor, jumping out of airplanes or leading in combat.

Expectations of personal self-efficacy are generally based on four major sources of information, according to Bandura (1977). First and often strongest, performance accomplishments based on personal mastery experiences increase the experience of self-efficacy. Secondly, vicarious experiences of seeing others perform dangerous activities without adverse consequences. Third, verbal persuasion from others into believing they can cope successfully with what has overwhelmed them in the past, and fourth, physiological states where the cognitive appraisal of arousal to a large extent determines the level and direction of motivational inducements to action.

The parachute training situation and the *Follow me* analogy connect directly to the self-efficacy framework. The routine in parachute training has always been the same. At the two-minute mark the soldiers in the airplane sing a short chant urging the lead-man – the drifter – to jump. The drifter, always the commander or the highest-ranking officer, turns around and asks "Will you follow me?" As far as anyone knows, the answer has never been anything but a loud and uniform 'yes' creating the verbal persuasion. That the leader is always first out of the door creates a vicarious experience, seeing others (the leader as well as anyone before them in the airplane) perform dangerous activities without adverse consequences. When an individual sees others around them – especially those considered role models – succeed by sustained effort they tend to increase their own belief that they too possess the capabilities to master the activities needed for success in that area. The uniform response to the symbolic act of asking if subordinates will follow creates a positive emotional state. When followed by a successful parachute jump the mastery experience can be added.

The concept of self-efficacy also has many similarities to the process of coping with a threatening situation discussed in the previous chapter. For example, the definition of coping with a threatening situation in the CATS theory of Ursin and Eriksen (2010) as a "positive outcome expectancy" (p. 567), is

highly similar to the description given by Bandura (1997) when he argues that "positive outcome expectations" (p. 284) represent the self-efficacy that the individual can handle the situation with a favorable result. In subsequent works by Eriksen and Ursin (2013) the concept of coping is further explained as both the strategies individuals use to solve a problem but also their belief in doing so. Furthermore, when discussing coping, the researchers make an explicit close connection to self-efficacy and state this construct is crucial in achievement settings.

Having a belief in one's abilities to perform specific tasks will generally enable one to actually perform, but it is not by any means a guarantee of success. High self-efficacy in a specific domain will generally lead to better performance in that domain but it is not the sole determinant of behavior (e.g., Sadri & Robertson, 1993; Stajkovic & Luthans, 1998). Falling short of reaching one's objectives can inhibit the belief in being able to do so, but such effects are more likely to occur early in the course of events, forming efficacy beliefs. The longer that strong self-efficacy beliefs are developed and reinforced by repeated success, the less occasional setbacks will reduce that belief (Bandura, 1977). But occasional setbacks happen to everyone and can be central, even necessary, in balancing beliefs about abilities and to avoid the phenomenon that Johnsen (1995) labeled the "over-confident": those underestimating the situational demands and overestimating the personal resources available to meet those demands. In this regard, occasional setbacks could be argued as necessary for defining the belief in one's abilities. Furthermore, Bandura (1997) argues that occasional setbacks can strengthen self-motivation and persistence by reminding individuals that difficult obstacles can be mastered by sustained effort.

Self-efficacy domains and domain transfer

Self-efficacy is most commonly viewed as a domain-specific construct (Bandura, 1997). That an individual can handle a boa constrictor does not necessarily mean that the same person will be comfortable in other arenas, such as public speaking in front of a large auditorium. The two are simply completely separate contexts which require different skills and therefore can have varying levels of self-efficacy attached to them. The efficacious beliefs related to ability in a specific context are most often referred to as domains (Hofstetter, Sallis & Hovell, 1990). Generally, having strong beliefs in one does not necessarily mean it will be equally strong in another, especially if those two represent disparate domains with no logical connection. But there are situations where the formation of beliefs in one domain has been shown to affect the formation in others as well, which is referred to as domain transfer.

There is no common definition of exactly what constitutes a 'domain'. The domain needs to cover a certain area or topic but still address specific behaviors relevant to that context. This creates a somewhat contradictory "not too general but neither too specific" principle that is easier to understand if exemplified. In their study of academic self-efficacy, Jackson and Dimmock (2012) described the domain as scheduling, planning, monitoring progress and overcoming barriers in college work. As such, it is not a general construct for all future academic situations, nor is it specific to a particular test. Similarly, in their measurement of physical/sports self-efficacy, McAuley and Gill (1983) specified examined gymnastics. As such, they did not measure beliefs aimed at every sport in the Olympics but did not mention specific events within gymnastics either. These domains are examples of what Bandura (1997) would label the intermediate level of assessment, with beliefs in performance under conditions sharing the same commonalities. If too broad, the definitions will border on the concept of self-esteem and lack predictive value.[4] In contrast, excessively specific definitions would eventually boil down to motor-functioning, lacking the cognitive functions where efficacy beliefs are formed. The concept of leadership self-efficacy (Hannah, Avolio, Luthans & Harms, 2008) is one that meets the criteria of the intermediate level (Bandura, 1997).

Even in the early studies on snake phobia, a number of subjects reported that the treatment increased their confidence that they could cope effectively with other fear-provoking events as well, most noticeably social phobia and public speaking (Bandura, Blanchard & Ritter, 1969). The observed transference effects showed that self-efficacy in one domain tended to generalize to other situations and that "behavioral functioning may improve across a wide range of activities" (Bandura, 1986, p. 399). In the previously discussed studies on stress and coping, Fenz and Epstein (Epstein and Fenz 1962; 1975) found that the abilities to handle stressful situations such as parachuting could indeed transfer to other sources of conflict and stress that could be overcome similarly. In one study, chronic stutterers undertaking parachute training experienced a significant alleviation of speech impairment following the jumps (Epstein & Fenz, 1962). In terms of coping, Ursin and Oiff (1995) argued that outcome expectancies toward coping tended to be generalized in the same way. The expanded view of coping as both a strategy and the belief in one's abilities supports the notion that such strategies and beliefs are indeed closely related to the efficacious beliefs of the individual and that these are applicable

[4] Some research has argued for general self-efficacy (GSE) as a broad sense of personal competence across different situations, but although such a general form of self-efficacy can indeed have its uses, previous research has shown that the "top-down" perspective from a general self-efficacy type instrument fails to address specific activities, and that a "bottom-up" approach using domain-specific self-efficacy instruments is better in this regard (Cervone, 1997; Cervone, Mor, Orom, Shadel & Scott, 2011).

across a wide range of demands (Eriksen & Ursin, 2013). The transfer of personal beliefs across domains was not the main focus of any of the previously discussed research (Bandura, 1969; 1977; 1986; Epstein & Fenz, 1962; 1975; Eriksen & Ursin, 2013; Ursin & Oiff; 1995) but it provides support that such an effect may exist and offers insight into the underlying mechanisms.

More recent research has supported the notion that self-efficacy can be generalized between domains (e.g., Bong, 1997; Brody, Hatfield & Spalding,1988; Jackson & Dimmock, 2012; Massar & Malmberg, 2017; Samuels & Gibb, 2002; Samuels et al., 2010). Or as Samuels et al. (2010) summarized it: "the broad beliefs associated with overcoming a difficult task transfer to beliefs that other difficult challenges can be overcome similarly" (p. 122). But despite this, and also in contrast to the vast research into self-efficacy in general, domain transfer is an area that has received relatively little attention (Feltz, 1992).

Although limited research has been conducted, previous research has offered some insight into the specific mechanisms that may enable the transfer across domains. Even in the earliest studies, perceived commonalities were emphasized. For example, although handling snakes and public speaking had no logical connection and the two were disparate domains, they still had perceived similarities in that they were both phobias that required similar self-regulatory skills to master (Bandura, Adams & Beyer, 1977; Bandura, 1986). Later research has supported this insofar that greater transfer effects have been observed when participants report a high level of perceived similarity between task demands (Bong, 1997). But the chance of transfer has also been argued to be moderated by individual motivation, and a greater chance of domain transfer exists if the individual perceives the secondary domain to be of similar or greater importance to them (Jackson & Dimmock, 2012).

Building on the early works, Bandura (1997) argued that there are several ways that personal efficacy can produce transfer across domains. First, when activities *require similar subskills*. Few activities are entirely new to an individual; in fact most contain a mixture of familiar and novel aspects. For example, the confidence in running a small company can be transferred to personal efficacy in running a community fund-raising campaign since the activities require similar organizational and problem-solving skills. Secondly, domain transfer can also exist through *codevelopment*. If activities are socially structured so that skills in dissimilar domains are required together, then transfer of perceived efficacy can occur even if they depend on different cognitive skills. For example, academic and athletic skills that are developed in parallel classes of instruction in a college setting are codeveloped and performance in one domain can therefore influence the other. The third way is when tasks require *similar self-regulatory skills* where the individuals will use the same self-regulatory capabilities in their self-appraisals and exhibit at least some transfer in their sense of personal efficacy across different activities. If activ-

ities elicit similar levels of anxiety and fear the individuals can use transferrable skills for diagnosing task demand and selecting courses of action as well as for managing stress and debilitating thoughts (Bandura, Jeffrey & Gardos, 1975; Meichenbaum & Asamow, 1979). Fourth, self-efficacy can transfer when mastery-oriented activities cultivate *generalizable coping skills* that enable individuals to exercise control over diverse threats. For example, women who were taught physical skills for handling sexual assailants presented a widespread increase in efficacy in handling a rich variety of potentially threatening situations, both before and after they get out of hand (Ozer & Bandura, 1990). Fifth, when activities are constructed in a way that frames and highlights commonalities it can create linkages between activities by *structuring commonalities cognitively* (Cervone, 1989). Put more simply, by just emphasizing the commonalities between two activities to the individual, beliefs can transfer more easily. And lastly, powerful mastery experiences can also lead to a *transformational restructuring of efficacy beliefs*. This last one is emphasized as the most powerful and one that enables beliefs to be generalized across widely disparate domains without any logical connection. Sometimes, success is so swift and so powerful in a domain where success was previously seen as so unlikely that it can lead to profound changes in participants' beliefs in their personal efficacy to exercise better control over other key aspects of their lives as well.

Although the research of transfer between self-efficacy domains has been limited, especially regarding training for extreme settings, some research has been performed in neighboring areas of research such as academic self-efficacy in educational settings. Studies have shown self-efficacy transfer between different educational subjects (e.g., English, Spanish, history, chemistry) in high school settings (Bong, 1997; Fryer & Oga-Baldwin, 2017) and between different activities on a campus setting for university students (Jackson & Dimmock, 2012; Massar & Malmberg, 2017). The mentioned studies have shown domain transfer to occur but rests largely on the premise of similarities between domains. It is also generally difficult to determine how much of learning in a school setting is the effect of a student's self-efficacy and how much is simply the result of general cognitive capacity and aptitude for learning subjects that are similar to each other, making these studies less relevant for the present research.

When it comes to transfer of more distant domains, research on physical self-defence has been found relevant for this thesis objective. In a study of self-defence for college women by Weitlauf, Cervone, Smith and Wright (2001) a physical self-defense course designed to handle violent and/or physical assault was given to one group and compared to a group of women who were on the waiting list for the same training. Participants were taught both physical techniques to defend against an assailant (e.g., basic punches, hammer fist-punches, groin and knee kicks) as well as verbal techniques to dissuade them, which was implemented in a realistic training setting. The results

showed that training led to increased self-defense efficacy but also that it had a generalizing effect on numerous other domains, including general coping and self-regulatory skills (coping efficacy), sport-specific physical competencies (sport self-efficacy) and interpersonal assertiveness (assertiveness self-efficacy). Bandura (1997) argued that strong mastery experiences in areas where success were thought unlikely was the most powerful mechanism for efficacy transfer to occur and fighting off an assailant in a realistic training setting as described by Weitlauf et al. (2001) fits well with this description and has similarities with the present research. Although the evidence for efficacy transfer is somewhat scarce, these findings suggest that such transfer can occur, and consequently, in terms of parachuting it is possible that the mastery experience of jumping may transfer to other relevant domains such as leadership self-efficacy.

There are several connections between the parachute training situation and leading in combat that could facilitate a domain transfer. Although they are disparate domains, they both represent situations of severe stress and anxiety which require similar self-regulatory mechanisms and coping skills. They are arguably similar in task demands and are both activities to which participants attribute great importance. Completing parachute training has also been described as a powerful mastery experience (Fenz, 1975; Samuels et al., 2010, Ursin et al., 1978) that could lead to a transformational restructuring of efficacy beliefs. Although parachuting and leadership represent disparate domains, the two share the psychological properties required for a domain transfer to occur.

Leadership self-efficacy

Leadership self-efficacy refers to leaders' "beliefs in their perceived capabilities to organize the positive psychological capabilities, motivation, means, collective resources, and courses of action required to attain effective, sustainable performance across their various leadership roles, demands, and contexts" (Hannah et al., 2008, p. 2). It is the specific form of confidence in the knowledge, skills and abilities associated with leading others.

Although several factors can arguably affect leadership self-efficacy, this thesis focuses on the sub-components of leader self-control efficacy (to maintain cognitive and emotional control) and leader self-assertiveness efficacy (the ability to make immediate and technically correct decisions when leading others) (Samuels et al., 2010). These sub-dimensions are consistent with other conceptualizations of leadership self-efficacy (Hannah et al., 2008). Leader self-control efficacy can contribute to efficacy in thought, self-motivation, and action, whereas leader assertiveness efficacy can contribute to efficacy in means and action (Samuels et al., 2010). Both the ability to retain composure

and make correct decisions when leading others have also been emphasized as essential, especially for leadership in extreme settings (Kolditz, 2007a).

These two sub-dimensions of leadership self-efficacy can help leaders in several ways. Leader self-control efficacy can facilitate cognitive control and functioning in stressful situations and allow the leader to focus on leading subordinates toward a common goal (McCormick et al., 2002; McCormick & Martinko, 2004; Murphy & Ensher, 1999). The ability to manage stress has specifically been associated with effective developmental leadership (Larsson et al., 2003). A leader's level of assertiveness efficacy will probably affect the development and execution of a leader's strategies and goals for any given leadership situation (McCormick, 2001). In other words, how the leader plans, prioritizes and executes in a leadership situation. High leadership self-efficacy has generally been connected to higher levels of transformational leadership (Chemers, Watson & May, 2000; Dvir & Shamir, 2003; Finn, Mason & Bradley, 2007; Luthans & Peterson, 2001). But in the reverse situation, individuals low in self-efficacy have been shown to be more likely to adopt a laissez-faire, or "non-leadership" leadership style (Courtright, Colbert & Choi, 2014).

Leadership

Leading in combat

For many individuals, a stereotypical image of a military leader in combat would probably be an authoritarian autocrat who screams orders that subordinates must reflexively obey. But contrary to stereotypical beliefs, the truth is usually the opposite. In a setting where life is at risk, no amount of formal authority is likely to command the respect of subordinates. Few contexts require a transformational or developmental leadership style as much as the extreme context (Kolditz, 2007b).

It is primarily the complexity and unpredictability of the context that creates a need for better leaders. The very nature of the context demands a decentralized way to command, which in return requires independence and initiative on all levels (Ben-Shalom & Shamir, 2011). This requires that followers have accepted the vision of the leader and the organization, can adapt it to the unique settings of the context, and perform beyond the capabilities they previously thought they possessed (Bass, 2008). In his doctoral thesis in sociology concerning the winter war in Finland, Pippings (1947) found that the formal discipline instilled in the barracks dissolved on the battlefield and that command in combat was an act of balance in managing humans. One of his main findings was that soldiers tended to strive for autonomy and liberty of action in meeting the contextual demands during combat, and that leaders needed to facilitate such behavior within the organizational framework. The extreme context is where the limitations in the stereotypical image of the military leader becomes evident. An authoritarian military leader who relies too heavily on formal discipline and centralized command will simply not be effective in influencing subordinates to achieve a common goal or be able to adapt to the adversities of the dynamic context (Borell, 1989).[5] The conventional "stick and carrot"-method of reward and punishment or authoritarian methods based on formal authority are almost completely ineffective for leaders in extreme contexts. That is not to say that transactional incentives such as

[5] This is not to be confused with the context of basic military training where formal and functional discipline is still a cornerstone in the pedagogy of drill and overlearning patterns of response for certain skills (i.e., weapons handling, radio procedures, directing fire, reporting coordinates) vital to enable autonomous behavior in later combat settings. (see e.g., Borell, 1989; Shalit, 1988).

pay, promotion or medals are completely irrelevant in military organizations – just less relevant, and especially in the specific context of combat.

A transformational or developmental leadership style does not exclude that certain leadership behaviors more resembling conventional or transactional leadership might be better suited in certain situations. Larsson et al. (2018) explicitly states that the positive aspects of conventional leadership may be seen as complementing rather than contradicting developmental leadership, for example, providing clarity in the leader's vision and expectations when facing adversity. In expanded conceptualizations like the full range leadership model, Avolio (2011) has also added "clear goals" as a more active form of conventional leadership. There might also be times when the leader will not have the time or possibility to explain certain orders to subordinates or for security reason will not be permitted to do so. But such leadership behaviors under certain conditions should not be viewed as a regression in leadership but rather as something made possible by asserting a transformational leadership style the rest of the time. In the extreme environments of combat the level of trust built through the competence and good character of the leader has been shown to determine the amount of influence subordinates accept (Sweeney et al., 2010). For example, in split-second moments when the leader is compelled to give an order to be obeyed immediately, the subordinates conform not because the formal authority exempts the leader from giving a reason, but rather because of a high level of trust that a good reason exists.

The development of leadership theories has been relatively parallel to the evolution of military organizations. Although a lot of research have been conducted, some have been more influential in shaping the view of leadership in military organizations in general and the Swedish armed forces specifically (for an overview, see Andersson, 2001). The early theories relied heavily on trait-theory – you're either born with leadership skills or not – and for example Lewin (1939) were among the first to test and categorize individuals into the styles of laissez-faire, authoritarian or democratic. Following this, motivational theories of leadership introduced that motivation of both subordinates and leaders can influence leadership. One theory was introduced by Herzberg (1959) who relied heavily on Maslow (1954) when he formulated the two-factor theory, arguing that both factors within the job itself and also those surrounding the job could influence motivation of subordinates and thereby organizational effectiveness. Another was McGregors (1960) X and Y-theory which recognized that managers perceptions and actions can affect follower's motivation in a cyclic way. Managers adopting a X-theory perspective perceive workers as lazy and therefore use a transactional method of rewards or punishments as motivation to a larger extent. In effect, their subordinates are more likely to do what is required and nothing more, thus reinforcing the leader's behavior. In contrast, Y-theory managers work on the assumption that subordinates are motivated and as a result employ a more interpersonal relation with them, enhancing their motivation in the same cyclic manner.

McGregor (1960) did not introduce the styles as opposites and asserts that both have advantages depending on context and type of group. The fact that both clarity in clear goals (transactional) and the motivation to make subordinates internalize and strive for them (transformational) are needed is recognized still today in the transformational and developmental leadership models (Bass, 2008; Larsson et al., 2003). During the 1960s research focused heavily on contextual factors and the complexity of the task. One of the primary theories to incorporate these factors was the situational leadership model (Hersey & Blanchard, 1969). The fundamental principle is that there is not any single best style of leadership, that effective leadership is task relevant and that the most effective leaders are those who successfully adapt their styles to the subordinates and the contextual demands. Due to its emphasis on contextual characteristics it was widely used in western military organizations up to the introduction of transformational leadership (Andersson, 2001).

In some ways the contextual demands will also change the leader-follower relationship in a fundamental way that also favors transformational/developmental leadership styles. The extreme context creates a classical outcome dependency (Berscheid et al., 1976; Clark & Wegener, 2008). The extreme context will make subordinates to a greater extent assess the leader's competence and intentions as well as how these will affect them. When a group is faced with a greater threat the individuals tend to a greater extent to assess and recategorize the behavior of those holding power over them. This categorization of others is dependent on two main factors: the available information and the perceiver's motivation (Dépret & Fiske, 1999; Fiske & Neuberg, 1990). In a context with a real or potential threat to life, the common vision becomes more salient and clearly demarcated from other issues, and the perceiver's motivation will be survival. Ironically, the extreme context will make the leader's job easier in that they will probably not have to compete for the attention of subordinates, but it will also be significantly harder in that the subordinates' evaluation of the leader as worthy and competent will be more scrutinizing. Kolditz (2007a) made similar observations when he argued that "In fear of their life, people don't care about fairness, equity, future rewards, or anything else except being led out of the circumstances that threaten their existence. In-extremis settings are the perfect incubator for transformational leadership" (p. 8). When facing more extreme contexts, followers will be more attentive to their leaders exerting the behavioral facets of a more transformational/developmental leadership (Hannah et al. 2009; Hannah et al., 2016; Lim & Ployhart, 2004). A more transformational or developmental leadership style is indeed good in any given context, but the importance increases in extreme situations. In a more traditional context with a given framework and clear requirements of performance, a transactional leadership style can be sufficient, sometimes even preferable. The extreme context accentuates the need for transformational leadership while followers in more conventional contexts are less attentive to such leader behavior, thus diminishing its effects (Hannah et al., 2017).

Transformational and developmental leadership

At the core of leadership are specific behaviors, and when certain behaviors are combined a leadership style is created (Larsson, Lundin & Zander, 2018). When models are compiled they present a hierarchy. The first, and least desired form of leadership, or non-leadership, is commonly referred to as laissez-faire. The laissez-faire approach is defined as the absence of leadership, where leaders avoid making decisions, and it reflects avoidance and withdrawal from leadership duties (Avolio, 1999; Bass, 1999; Larsson et al., 2006). In subsequent research, the bottom-part of the model has been expanded to not only include non-leadership but also directly negative effects of certain behavior described as 'destructive leadership' (Brandebo, Nilsson & Larsson, 2016). The second form of leadership is the conventional (or transactional) leadership style. Conventional leadership relies on contingent reward where the leader exercises a high degree of control in relation to subordinates. It is primarily concerned with formal agreements where the leader hands out tasks and the subordinates execute them, because that is what the hierarchy and organization stipulate. Compliance is often motivated primarily by reward or threats of sanctions or punishment. The third form of leadership is the developmental or transformational leadership where the leader's behavior inspires subordinates to perform beyond their perceived abilities in a way that improves both the individuals and the organization.

Transformational leadership includes enhancing the motivation, morale and performance of subordinates when the followers accept the values and the mission of the organization as their own because of positive influence (Bass, 1985; Burns, 1978). The leader's behavior inspires subordinates to perform beyond their perceived abilities in a way that improves both the individuals and the organization, hence the 'transformation' implied by the name. The transformational leadership model is widely used and has been associated with greater follower satisfaction, leader task performance and leader effectiveness (Banks, McCauley, Gardner & Guler, 2016). It has also been related to better performance on both the team and organization levels in a variety of contextual settings and has been shown to have an augmentation effect over transactional (conventional) leadership in predicting individual and team-level performance (Wang, Oh, Courtright & Colbert, 2011).

The leadership model used by the Swedish Armed Forces today is the developmental leadership model (Larsson et al. 2003; Larsson, 2006a). The model builds heavily upon transformational leadership (Bass, 1998) as well as the full range leadership model (Avolio, 1999; Bass, 1999). The differences between the two models are mostly oriented around cultural variations where DLM has been adjusted based on research within a Scandinavian context. For example, the element of charisma, central to transformational leadership (Bass, 1999), was found unsuitable in a Scandinavian leadership culture (Larsson et al., 2003). A more developmental leadership style has been shown in

longitudinal studies to increase favorable leadership behaviors and to significantly reduce unfavorable leadership behaviors (Larsson, Sandahl, Söderhjelm, Sjövold & Zander, 2017); however, it has not been as thoroughly evaluated as the transformational leadership models or other more international equivalents.

Certain facets of leadership behavior are commonly referred to as dimensions that constitute a leadership style (Larsson et al., 2018). The first dimension in the developmental leadership model is the *exemplary model*. It relies more on state of the mind and a "live as you learn" mindset than specific behaviors. This dimension relates strongly to the concept of being a role model where the leader's actions and words correspond. In this regard, it is very similar to the concept of authentic leadership (Gardner, Avolio, Luthans, May & Walumbwa, 2005) and having the courage to be genuine. Authenticity has also been pointed out as vital in in-extremis settings (Kolditz, 2007a). Liden and Mitchell (1988) argued that leaders will try to present a favorable image to subordinates and act in ways that convey confidence by asserting moral conviction and will demonstrate the integrity to stand and live by these principles even when they may not be popular. The second dimension is *individualized consideration,* which means providing support that makes subordinates feel important and competent, which in turn increases their potential for development. This consideration includes both encouraging and providing support as well as confronting individuals and resolving conflicts when they arise. In this regard, a developmental leadership behavior has been argued to not only include different subfactors of support, but also specifically how this is done. For example, confronting unwanted behavior from subordinates in a hostile and judgmental manner will probably cause blowback and negative consequences. But by confronting the problem with an open mind the leader can find out if there were additional factors involved, and trust will increase if it is clear to all involved that the leader's reason for confronting is based on genuine concern for the individual (Larsson et al., 2018). The third and last dimension is that of *inspiration & motivation* and refers to the ways leaders act that inspire their subordinates and which promote a common understanding of higher objectives as well as increased participation by subordinates in reaching those objectives. Inspiration and motivation are intricately linked to the concept of emotional and behavioral contagion where a leader's emotional state influences how their subordinates feel (Johnson, 2008). A leader spreading a "can do" attitude will probably instill such a mindset in the subordinates as well. But the opposite can also be said. Someone who has doubts in their abilities or fosters negativity can discourage the most enthusiastic subordinate.

Individual behaviors can be influenced by several factors, on both the individual and organizational levels, at any given time (Endler & Magnusson, 1976). In previous studies, it has been argued that developmental leadership is constituted by a combination of individual characteristics and the context of

the leader. On the organizational level, different contexts create varying possibilities for leaders to show certain types of leadership behaviors. Influencing factors can include both bureaucratic structures that restrict the autonomy of the leader, cultural aspects or norms that regulate how individuals relate to each other. In this regard, the military, although all wear the same uniform, is not a homogenous organizational culture. Shalit (1988) pointed out that the different modus operandi of the various units affects the organizational culture and therefore leadership behaviors.

On the individual level, developmental leadership behaviors have been argued to be predicted by a number of characteristics. In relation to the present thesis, this is especially interesting because some of these characteristics bears resemblance to the concept of self-efficacy, making it relevant to include these in the analysis to determine how they contribute to leadership behavior in relation to each other. They are comprised of the basic prerequisites like physical and psychological prerequisites of the individual but foremost desirable competencies that they possess. The first desirable competence is *task-related competence* which concerns 'hard' aspects of being knowledgeable in one's field. Secondly, *management related competencies* such as the ability to prioritize and make decisions within one's own organizational framework, but also being attentive and adaptive to external factors affecting one's own organization. *Social competence* is the third and comprises the human ability to listen, to be conscious and attentive to how one is perceived, as well as to be attentive to expressed or uncommunicated feelings of subordinates and engage in a good communicative dialog. Lastly is the *capability to cope with stress*. This includes both the ability to master one's own emotions under stress (commonly referred to as intrinsic regulation) but also being able to behave in a way that enables others to manage their feelings as well (extrinsic regulation). The capability to cope with stress builds heavily on Folkman and Lazarus' (1984) view on appraisal and coping as well as the theory of emotional contagion (Gross, 2002; 2014), when emotional synchrony occurs between individuals and one person's emotions trigger similar emotions in others.

A scale used to measure how individuals perceive themselves regarding both desirable competencies and the different characteristics of a developmental leader is the Developmental leadership questionnaire (DLQ; Larsson, 2006b). The scale is based upon and is highly similar to the Multifactor leadership questionnaire (MLQ; Avolio, Bass & Jung, 1998) measuring transformational leadership. Both scales consist of similar number of items and besides the adjustments described in the previous section the DLQ was modified by "de-Americanization" to better adjust items for a Scandinavian context. The DLQ was evaluated in a separate study and has since been used to assess and develop leaders in the Swedish armed forces (Larsson, 2006b).

Developmental leadership in the extreme context

The developmental leadership model does recognize that the external environment will influence leadership styles (e.g., Larsson & Hyllengren, 2013). Even if the extreme context will not fundamentally change the factors affecting leadership (i.e., Bass, 2008; Larsson et al., 2018) it can change the weighting on how and to what extent different factors affect successful leadership (Wang et al., 2011).

One important factor that can vary between contextual settings is the tolerance to stress, listed as a basic prerequisite in the developmental leadership model (Larsson et al., 2003). Arguably, the capability to cope with stress is more needed in contexts with higher levels of inherent stressors. But the description by Larsson et al. (2018) also relates directly to in-extremis leaders where for example the emotional contagion of extrinsic regulation exemplified from Gross (2002) (if leaders stay calm, the followers stay calm) is very similar to the vicarious experience of seeing others perform (including to retain composure) described by Bandura (1977; 1997). This experience is comparable to the leadership effect described by Kolditz (2007a) as vital for in-extremis leaders: "a leader who appears confident sends a tacit message to subordinates: that they should rely on the leader's competence because the leader is convinced it exists" (p. 75).

The extreme context has also been argued to in some cases redefine the dynamic among leader, followers and the contextual demands. One example of a changing concept is that of 'motivation' which can differ between classical and more extreme contexts. When the participants of the national parachute team were asked to rank behaviors from leaders, Kolditz (2007a) noted that motivation ranked second last from the bottom. The explanation given for this somewhat counter-intuitive finding is that the context is inherently motivating, unlike the intrinsic motivation of the individual. In extreme contexts, motivation is not primarily given interpersonally directly toward subordinates but through the leader responding to the contextual demands, making factors like shared risk and shared lifestyle not only symbolical but crucial. Kolditz (2007a) argues that leaders could actually make things worse by trying to add interpersonal motivation by a pep-talk or cheer leading if this is not accompanied by the motivation instilled in subordinates when leaders master the contextual demands.

Although it sounds reasonable that an extreme context holds a different motivation than a conventional context, there is no definitive explanation of why and how this redefines the leader/follower dynamic. Weick (1988) argued that in extreme situations the increased need for sense-making in extreme situations tends to make individuals shift focus toward the contextual factors creating the crisis. In this regard, subordinates will probably assess a leader to a greater extent from their interaction with the contextual characteristics than the interpersonal interaction. The extreme context can also change the framing

for decision-making, thereby possibly creating a biased decision-making model (Kahneman & Tversky, 1979; 1984). In situations which involve risk and uncertainty, individuals will dislike losses more than liking the prospect of gains. Arguably the risk of losing one's life is more threatening (and more serious) than winning medals or promotions, affecting choices in such situations regarding mitigating negative outcomes. The extent to which biased decision-making occurs depends on the weighing of probabilities. It is reasonable to assume that the degree of threat affects decision-making to varying extents in different situations, depending on the weighing of probabilities of adverse outcomes. Put more simply, the more acute the threat of injury and death the more attentive subordinates will be to leadership behaviors aimed at mitigating such risks. As discussed earlier, death is not always the primary fear in combat settings (Shaffer, 1947), but arguably the biased model of decision-making could be equally applicable to any fears within the extreme context.

In summary, preparing to lead in combat is not fundamentally different from preparing to lead in other contexts. But the contextual nature will add more weight to certain factors of the specific leadership models (i.e., Bass, 2008; Larsson et al., 2018). It can also in some instances reshape the dynamic formed among the leader, the followers and the contextual demands. Organizations that routinely work in extreme contexts will naturally rank the importance of a leader's competencies differently than more normal organizations (Kolditz, 2007a; 2007b).

Summary of studies

Three empirical studies were conducted in order to address the aims of the thesis. The approach is quantitative, combining a longitudinal and cross-sectional method. Below is a table with an overview of the studies included in the thesis, including their respective research question, sample and participants, design and analytical method used. Study I investigated whether successful completion of a static line parachute program would transfer to the neighboring domains of leadership self-efficacy as had been demonstrated with a freefall parachuting course by Samuels et al. (2010). Study II investigated whether non-completion of the same static line parachute course was associated with not only the absence of the positive effects, but any direct and sustained negative effects on leadership self-efficacy. Study III built upon the results of Studies I and II and investigated how leadership self-efficacy is associated with the facets of the developmental leadership model (Larsson et al., 2003).

The study by Samuels et al. (2010) on a freefall parachuting program for cadets at the US Air Force Academy was a methodological starting point for this thesis. Study I built upon their work with the methodological additions to add a control/comparison group for all repeated times of measurements. In addition, the parachute technique was changed from the more mastery-oriented freefall parachuting to the static line parachuting that is more common among military organizations worldwide.

A pre-study was conducted prior to Studies I and II where the leadership self-efficacy scale (LSES; Samuels et al., 2010) was translated and validated in a separate sample (N = 165) by means of a factor analysis. The result was a shortened version of the LSES used in Studies I to III, presented more thoroughly in the measurements section below.

Table 3: *Overview of the methodological approach*

	Study I	**Study II**	**Study III**
Research question	If participation in a parachute training course is associated with higher leadership self-efficacy	If the inability to complete a parachute training course is associated with direct and sustained effects on leadership self-efficacy	How leadership self-efficacy is associated to the developmental leadership model
Sample & participants	231 cadets (152 jumping, 79 non-jumping)	199 cadets (181 complete, 18 non-complete)	111 officers
Design	Longitudinal	Longitudinal	Cross-sectional
Time of data collection	2014-2016	2014-2016	2019
Method of data collection	Paper questionaire	Paper questionaire	Online survey
Analytical method	Repeated measures Anova	Repeated measures Anova	Hierarchical linear regression

Data collection and sample

Studies I and II

Studies I and II included a total of 278 cadets from the Military academy. The three-year long officer training program includes both academic classes of instruction as well as practical elements of instruction. Data collection was conducted from three consecutive classes over three years. The curricula for all courses were identical during the period. During the beginning of their second year, after the summer break in early August but before the beginning of the academic semester, the individuals undertook the two-week course aimed at personal improvement.

The total of 278 cadets participated in different courses of instruction. Cadets from the army (N = 152) and air force with future positions on flight status (future pilots and aircrew) (N = 29) undertook the basic airborne course designed to teach static line parachuting. Those who for any reason were unable to complete the course (inability to meet the required standards on safety tests, medical reasons, removed by instructors, voluntary withdrawal) were also followed up in a separate group (N = 18). All non-completers came from the army group. Cadets from the navy and air force (ground personnel not on flight status) took part in courses of instruction in basic seamanship on a navy ship and basic airmanship at an air force base (N = 79). The courses for navy and air force personnel had no acute evolutions presenting a perceived threat to life or exclusionary tests like the parachute course, and no dropouts.

The participants completed questionnaires on three different occasions. The first was before training had commenced at each training site. The second was after the completion of each course two weeks later. The third follow-up measurement was performed five months later when all participants were gathered at the Military academy.

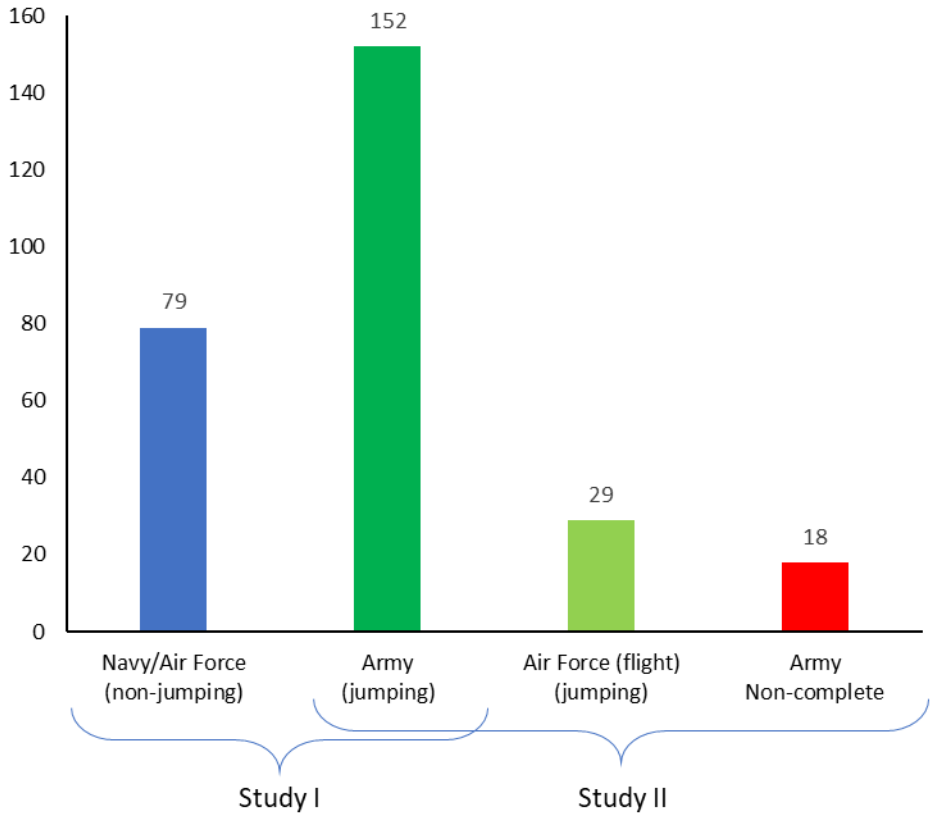

Figure 3: *Overview of participants in Studies I and II*

In Study I, the 152 cadets from the army formed the jumping group and the 79 cadets from the navy and air force formed the non-jumping group. For Study II, the 181 cadets from the army and air force (on flight status) who had undertaken the basic airborne course formed the completers group. The 29 jumping cadets from the air force were not included in Study I, but the decision was made to include them in the jumping group for Study II. Although an additional reason for them undertaking the course was for flight safety they undertook the course with the same basic learning objectives as the army cadets. It was also preferable to include everyone who had jumped (or tried to) in the same course for a more accurate comparison of completers versus non-completers. The 18 individuals who had been unable to complete training (all from the army) formed the non-completers group.

Study III

The participants were 111 military students and teachers from the Swedish defense university. All belonged to the higher officer training program that is

required for officers in order to be promoted to the higher rank of OF3 (major/lieutenant commander) and OF4 (lieutenant colonel/commander). The students came from all branches of the armed forces, had applied voluntarily and qualified for the training by meritorious service and a prognosis for higher leadership positions. The teachers also came from all branches of the armed forces and had been appointed due to previous meritorious service relevant to the present course.

Data collection was carried out online by measuring factors related to leadership. Participants were contacted using internal e-mail and were asked to visit the online site for the survey where they were given additional information about their participation and responded to an online questionnaire.

Measurements

Leadership self-efficacy was measured using a short version of the Leadership Self-Efficacy Scale with the subscales of self-control efficacy and assertiveness efficacy (LSES; Samuels et al., 2010). The original LSES scale was translated into Swedish and validated by factor analysis in a separate study before commencement of the studies in this thesis. The three items of the factor analysis that met the inclusion criteria and best matched the two original subscales were selected. Both subscales included six items, for example "I can easily shift attention away from thoughts that scare me" (self-control) or "I can easily lead others, maintain the same high standards, and not be seen as hypocritical" (assertiveness). The responses were assessed on a seven-point response scale (1 = do not agree, 7 = fully agree). LSES was used in all three studies. The Cronbach's alpha ranged from .70 – .81 for self-control efficacy and .61 - .74 for assertiveness efficacy between the samples of each study.

Developmental leadership was measured using the Developmental Leadership Questionnaire (DLQ; Larsson et al., 2003; Larsson, 2006b) with the three dimensions of exemplary model, individualized consideration and inspiration and motivation. The dimensions each had three or four items, such as "Discuss what values are important before making decisions" (exemplary model), "Show empathy for people's needs" (individualized consideration) and "Create enthusiasm for a task" (inspiration and motivation). Respondents marked their answer on a on a nine-point response scale (1 = do not agree, 9 = fully agree). DLQ was used in Study III. Cronbach's alpha in this study was: .77 for the exemplary model, .84 for individualized consideration and .80 for inspiration and motivation.

Anxiety was measured using the State Trait Anxiety Inventory – State scale (STAI; Spielberger, Gorusch & Lushene, 1970). The scale includes 20 items, for example "I feel tense" or "I feel calm", assessed on a four-point response scale (1 = almost never; 4 = almost always). STAI was used in Study II. Cronbach's alpha = .83.

Stress was measured with the stress/energy form (Kjellberg & Iwanowski, 1989). The scale includes six adjectives to answer the question "How have you felt at work for the last week?", for example "Tense" or "Relaxed", thereby describing the person's state at that specific time. The adjectives were rated on a six-point response scale (1 = not at all, 6 = very much). The stress/energy form was used in Study II. Cronbach's alpha = .80.

Collective identity was measured using the Collective Self-esteem Scale (CSES; Crocker & Luhtanen, 1990), sub-scale Importance to Identity that assesses the importance of one's social group memberships to one's self-image. The scale includes four items, for example "My belonging in the Swedish Armed Forces is an important reflection of who I am", rated using a seven-point response scale (1 = strongly disagree, 7 = strongly agree). The CSES was used in Study II. Cronbach's alpha = .72.

Ethical issues

All procedures and questionnaires that were used were approved by ethical vetting by the Swedish Ethical Review Authority. Studies I and II were approved in 2014 and 2015 with reference number 2014/582-32/5 for the first year and 2015/1032-32 for the second and third year of data collection with the additional measurements used in Study II. Study III was approved in 2019 with reference number 2019-03118.

Participants were also treated in accordance with the human research principles and good research practices formulated by the Swedish Research Council (2000). At the beginning of every course described in Studies I and II the participants were: 1) given information about the aim and scope of the research. 2) informed about consent and voluntary participation as well as their right at any time, without explanation, to discontinue their participation, and that if they wished, any collected material regarding them would then not be used in the study. 3) informed about the confidentiality of the collected data and that they were guaranteed anonymity. 4) informed that the data was collected for a specific use and would not be used for any other purposes than the present research project. With Study III the same information was given before participants took the online survey.

The research principles formulated by the Swedish Research Council (2000) specifically call for caution when studying individuals in emotional crisis. The parachute training situation certainly meets this criterion. However, the same principles also state two requirements for such research to be conducted: first, that the goal of the research conducted should be to acquire knowledge relevant to the present group, and secondly that other groups are unavailable for studying the same phenomena. Since this type of military

training is not given to outsiders, and the present research was performed explicitly in order to improve the training conducted, both requirements were arguably met.

Since the researcher (a military officer in uniform) was present during training for the data collection used in Studies I and II, the participants were informed that the presence was solely in a scientific role. It was emphasized that no data collected about the participants' individual performance would be reported to the Military academy or would in any way affect their future professional career in the armed forces.

Study I – Preparing to lead in combat: Development of leadership self-efficacy by static line parachuting

Background and aim

One of the main challenges in training military officers has always been to prepare them to lead in combat. This is vital because the extreme context is normative for military leaders and a failure could lead to the death of the leader and their subordinates (Fisher, Hutchins, & Sarros, 2010; Hystad, Eid, Laberg, & Bartone, 2011; Klann, 2003). During peacetime it is almost impossible to expose individuals to the inherent dangers and extreme stress of actual combat; therefore, the military uses training courses that expose individuals to extreme conditions but within a controlled environment which will make them better prepared to handle future situations (Meichenbaum, 1985; 2007). One such form of training is military parachuting (Aran, 1974, Boe & Hagen, 2015; Samuels et al., 2010; Shalit, et al., 1986).

Jumping from an aircraft is an intensely frightening situation where individuals will experience stress anxiety and fear (Epstein & Fenz, 1962; 1965; Fenz & Epstein, 1968). By mastering one stressful situation the individuals establish an expectation to handle other situations with a positive result as well (Ursin & Eriksen, 2004; 2010). The overall purpose of the study was therefore to investigate whether military parachute training was associated with an increase in the separate domain of leadership self-efficacy.

Previous research has shown that successful completion of a military freefall parachute course was associated with an increase in the individual's belief in their leadership abilities – the individual's leadership self-efficacy (Samuels et al., 2010). Self-efficacy is generally a domain-specific construct, but under specific conditions the beliefs in one domain can transfer to other domains, so that the individual believes that other tasks with equal or even greater difficulty can be overcome similarly, even if they have no logical connection (Bandura, 1997). Although such transfer of beliefs (domain transfer) has been indicated in the more mastery-oriented freefall parachuting, the aim of the first

study was to examine whether self-efficacy transfer occurs with the more common method of military static line parachuting.

Main findings and conclusions

The analysis performed in Study I was a repeated measures analysis of variance (ANOVA) conducted covering the three assessment times for the jumping and non-jumping groups. Since random assignment of participants was not possible, the two groups were compared on the variables of gender, age as well as self-efficacy before the course and between the three years when data was collected.

The groups did not differ between gender, age, year sampled or self-efficacy before the commencement of the course. The main finding was an interaction effect for group and time for leader self-control efficacy. The confidence intervals were non-overlapping for the jumping group between the before and after measurements and indicated that the jumping group increased leader self-control efficacy during the course and that this effect was sustained at the follow-up measurement five months later. The second ANOVA for leader assertiveness efficacy showed a main effect of time but no interaction effect. The means and confidence intervals showed that the two groups both increased their leader assertiveness efficacy during the study, but not significantly so.

The results from the study support the hypothesis that self-efficacy can develop in disparate domains using the static line parachute method, although only for leader self-control efficacy. A possible reason is that it is the perceived threat to life and the acute stress of the parachute situation, not the specific method of parachuting, that creates the necessary conditions for efficacy to develop in disparate domains.

Study II – Direct and sustained effects on leadership self-efficacy due to the inability to complete a parachute training course

Background and aim

Falling short of our goals is something that happens to all of us. Doing so is an unwanted and often unexpected outcome where the individual will have to deal with both an undesired outcome as well as deal with their perceptions of their own abilities. Although this can, and will, happen in all aspects of life, doing so in military settings, which place a premium on performance and winning, can have more adverse consequences (Klann, 2003).

The central idea behind military training courses aimed at developing leadership skills is to expose individuals to a high but manageable level of stress (Meichenbaum, 2002; 2007; Maddi, 2006; 2007). Such courses function with, and are dependent on, high levels of stress in order to facilitate the desired personal development but not so much that the individuals cannot complete them. An effect of working with high levels of stress is that not all individuals will be able to successfully complete the training courses.

The desired positive effects of undertaking extreme training courses are dependent on the mastery and successful completion of the courses (Bandura, 1997). Therefore, it was relevant to investigate whether there are any differences between those who successfully complete such courses and those who do not, and if non-completion was associated with not only the absence of a positive effect but also possible direct and sustained negative effects.

Main findings and conclusions

The two groups of completers versus non-completers were compared on demographical variables such as age and gender before the course. Additionally, they were compared on leadership self-efficacy, anxiety (Spielberger, Gorsuch, & Lushene, 1970), Stress (Kjellberg & Iwanowski, 1989) and collective identity (Crocker & Luhtanen, 1990). To test for the effects of non-completion, two repeated measure ANOVAs were conducted for each of the subcomponents of leadership self-efficacy to examine differences between the two groups.

The results showed no pre-existing group differences in any of the demographic variables or in the psychological variables of stress, anxiety or collective identity. Somewhat unexpectedly, the non-completers actually rated themselves *lower* on both stress and anxiety prior to the course. The differences were small and insignificant but opposite to what one might expect.

The ANOVA for leader self-control efficacy showed a significant main effect of group, and more importantly qualified by an interaction effect of time and group. Calculation and comparison of the confidence intervals showed that while the completers group had a significant increase in leader self-control efficacy the non-completers had a significant reduction, and this effect was sustained at the follow-up measurement five months later. The ANOVA for leader assertiveness efficacy showed no significant main effects or interaction effect. The calculation and comparison of the confidence intervals indicated that while the completers showed a steady increase in leader assertiveness efficacy (although not enough to be significant) the non-completers did not show the same increase.

The results indicate that the non-completion of a parachute training course is associated with not only the absence of the desired effects but with direct and sustained negative effects in leader self-control efficacy. From a scientific perspective, the results indicate that the reduction in self-efficacy beliefs can

have effects across domains in the same manner that increased beliefs have been shown to do. Although the sample size was limited and the distribution uneven between the two groups, they were sufficient to show a clear significant result in regard to outcome in leader self-control efficacy.

Study III – From believing to doing – The association between leadership self-efficacy and the developmental leadership model

Background and aim

Cognitive beliefs in one domain will generally be associated with behavior within that specific domain. However, the individual will always function in different social, organizational and contextual settings that will present unique strains (Chan & Drasgow, 2001; DeRue & Wellman, 2009; Dragoni, Tesluk, Russell, & Oh, 2009; Porter & McLaughlin, 2006).

When individuals report a high degree of self-efficacy in a specific domain it could be argued to be associated with behaviors related to better performance in that area (Stajkovic & Luthans, 1998) like leadership (Hannah & Luthans, 2008). Although this is generally the case, it is not clear exactly how self-efficacy will affect leadership. Most leadership models are, for good reasons, complex models that try to encompass different factors relevant to the leader.

There is a lack of knowledge on exactly how the concept of leadership self-efficacy is related to specific models of leadership. Although it has been argued *that* self-efficacy is associated with leadership, it is not as clear exactly *how* it relates to the dimensions of specific leadership models. Therefore, the aim of the study was to examine how the two sub-domains of leadership self-efficacy (Samuels et al., 2010) were associated with the facets of the developmental leadership model (Larsson et al., 2003).

Main findings and conclusions

To investigate the association, a cross-sectional design was used on a sample of teachers and officers from the higher officer program at the Swedish Defense University. The participants were selected since they had all qualified for the position by previous meritorious service in leadership positions. Three separate hierarchical multiple regressions were calculated for each of the three dimensions of exemplary model, individualized consideration and inspiration & motivation that distinguish developmental leadership in the model.

Leader self-control efficacy only predicted developmental leadership in the exemplary model dimension and when other variables were included in the form of desirable competencies from the leadership model in the later stages of the regression analysis it lost its predictive value. Leader assertiveness efficacy predicted two dimensions (exemplary model and inspiration & motivation) and remained a significant predictor even after the variables of desirable competencies from the leadership model were added.

Leader assertiveness efficacy seems to be a better predictor than leader self-control efficacy of the dimensions of developmental leadership. The study does not distinguish how the two sub-components relate to the desirable competencies specific to the leadership model, which is a topic recommended for future research. One possible explanation for the difference between the two sub-components of self-efficacy might be that self-control efficacy contributes to efficacy for thoughts and self-motivation while assertiveness efficacy contributes to means and action (Samuels et al., 2010). Put more simply, self-control might be what enables the individual to function within an extreme context, but leader assertiveness can be what most determines the leadership behavior within that context.

Discussion

The overall aim of this thesis was to investigate whether and how military parachute training can function as a method for leadership development. More specifically, whether successful completion of parachuting can increase leadership self-efficacy; secondly, whether inability to complete training was associated with any direct and sustained effects; and lastly, how leadership self-efficacy was associated with the developmental leadership model. The results indicate that parachute training was associated with increased self-efficacy, but they also indicate that not completing training can lead to similar but negative effects in decreased self-efficacy. There were associations between leadership self-efficacy and developmental leadership, but not the ones expected from the results in Studies I and II. In the sections below, each of the respective aims of the separate studies is discussed. Finally, practical implications and some overarching topics are addressed.

Completing parachute training

The aim of the first study was to examine whether participation and successful completion of parachute training was associated with higher self-efficacy in disparate domains. Study I used the more common method of military static line parachuting as compared to the freefall parachuting previously studied (Samuels et al. 2010). The freefall parachute method is one that is more mastery-oriented and requires more active points of performance from the individual. Static line on the other hand is highly automated and is the more common method taught in military settings. Jumping from an airplane requires individuals to handle inherent feelings of stress and anxiety (i.e., to exercise self-control) and execute certain active points of performance required to master the task at hand (i.e., to show assertiveness), which according to theories of self-efficacy transfer (Bandura, 1997) could lead to the development of self-efficacy in sub-domains of leadership. The results from Study I supported the hypothesis that self-efficacy can develop in disparate domains using the static line parachute method, although only for leader self-control efficacy. Leader assertiveness efficacy increased over time, similarly for both groups and in a non-significant way without being affected by completion of parachute training.

The results indicated that the perceived threat to life and acute stress is inherent in the parachute situation and are not dependent on the specific method of parachuting. Although differences exist, at the most basic level both freefall and static line parachuting involve jumping from a perfectly good airplane, descending with a parachute, and performing a controlled landing. Different studies on freefall parachuting (i.e., Fenz, 1975; Johnsen, 1995) and static line parachuting (i.e., Basowitz et al., 1955; Ursin et al., 1978) indicate that the stress response and coping mechanisms needed are similar, which could create the necessary conditions for efficacy to develop in disparate domains.

The sub-domain of leader assertiveness efficacy increased between all points of measurement but did so for both groups. The continuous increase could have several explanations. On the individual level, this could be due to the fact that static line parachuting requires the individual to execute fewer active points of performance, which could influence the level of assertiveness. On the organizational level, all participants from both groups were future military officers taking part in a three-year program which placed a premium on leadership development. That leader assertiveness efficacy increased similarly for both groups could indicate that parachute training indeed facilitated the development of assertiveness efficacy, just not more than in relation to other courses aimed at personal development that the individuals undertook. In addition, cultural factors could contribute to variations between countries. For example, the "Follow me" practice (Gavin, 1947) rests heavily on the inspiration/motivation component of transformational leadership described by Bass (1985), but the developmental leadership model has reduced the importance of such aspects due largely to cultural differences (Larsson et al., 2003). As leadership can vary in different cultural settings it is reasonable to believe that the development of efficacy beliefs can vary in the same way as well.

Other organizational aspects that could affect the development of efficacy beliefs, not only domains related to leadership, are the symbolic value within the organization. Successful completion of the parachute course allows the individual to wear jump wings on their uniform, and special badges are traditionally given for special achievements and imply higher status within the military collective (Aran, 1974). The symbolic value has been argued to be a factor that influences the desired identities of the individual as well as the institutional processes to attain and live up to those identities (Thornborrow & Brown, 2009). The socializing effects have been described as reducing anxiety for employees and as assisting them in coping with ambiguity (Alvesson & Willmott, 2002). It is reasonable to believe that such symbols could affect the development of self-perceptions through the development of social identity, but little research exists as to the extent and specific effect they have on the individual.

In summary, completion of a parachute training course was associated with the development of self-efficacy beliefs in the domain of leader self-control efficacy, which represents the individual's ability to retain composure. The

parachute training situation seems to be suitable for such training regardless of the specific type of parachute technique used. It remains to be explored how these beliefs relate to other forms of training given and how and to what extent the social and organizational context influences the development of efficacy beliefs.

Non-completion of parachute training

Courses like parachute training function on a high but tolerable level of stress that can be mastered only by sustained effort. Even if all individuals taking part possess the capability to complete the course, actually doing so will also be dependent on social and contextual factors. Consequently, not all individuals will be able to complete such courses. Because the positive effects of undertaking extreme training courses are dependent on the mastery and successful completion of parachute training (Bandura, 1997) it was relevant to investigate whether non-completion led to not only the absence of positive effects but also any direct and sustained negative effects.

The rate of non-completers in Study II was 9.9%. The number is roughly comparable to the 8.9% reported by Basowitz et al. (1955) and the 6.3% reported by Samuels et al. (2010). It is hard to draw any conclusions at all from the reasons for non-completion. In Study II, those who were unable to complete training were removed for both medical reasons (N = 5) and an inability to meet the requirements on specific tests (N = 13). As noted by Ursin et al. (1978) the somatic and psychological symptoms tend to overlap, and it can be equally common for individuals to use minor somatic symptoms as "face-saving" for non-completion as it is for highly motivated individuals to hide or diminish more serious injuries or seek medical treatment to reduce symptoms in order to be able to continue and complete the training with their peers. All 199 individuals undertaking the course certainly experienced psychological symptoms of stress and anxiety as well as somatic symptoms such as fatigue, bruises, abrasions and soreness. But it is impossible to determine from the current data to what (if any) extent the varying reasons affected the rate of non-completion. The specific coping mechanisms of handling non-completion have been examined in a separate qualitative study (Bergman, 2019).

The design of Study II involved both antecedent conditions for non-completion as well as the consequences thereof. Interestingly the comparison of completers versus non-completers showed no significant differences in either demographic factors or any psychological variables prior to taking part in the course. One interesting finding worth mentioning is the differences in mean values in Study II. The non-completers actually scored themselves *lower* on both stress and anxiety. The differences were small and insignificant, but the opposite of what one might expect. The exact same *too calm-phenomenon* of lower rates by non-completers was noted by Basowitz et al. (1955) and Fenz

(1975) in the self-assessments of non-completers. Both these studies describe how, in situations where demands become too great and individuals are unable to cope, they gradually withdraw from active participation in the threatening world around. The breakdown of coping mechanisms will then lead to a reduction of stress and anxiety. The results in Study II do not offer any conclusive explanation for this counter-intuitive finding. One small difference is that the decrease in stress and anxiety occurred earlier in the cycle in Study II when compared to Basowitz et al. (1955) and Fenz (1975). It is possible that some individuals had already anticipated not completing the course and therefore did not experience stress and anxiety about a parachute jump they did not expect to make. Another possibility is that individuals suppressed such reactions, causing a delayed effect. The inhibition of autonomic responses in extreme settings like parachuting has been reported to often cause a delay in response until an appropriate time and place for their expression appears, and that experiences of stress and anxiety as well as somatic reactions such as crying, vomiting and fainting often occur hours to days after the event (Epstein & Fenz, 1965). Basowitz et al. (1955) reported similar effects and described this as the *end-phenomenon*. The inhibition and delay of stress responses is not uncommon in high-stress settings, and heightened levels of anxiety and stress can occur days, or even weeks later, including long-term effects such as post-traumatic stress disorder (Koba et al., 2001; Koolhaas, Meerlo, Boer, Strubbe & Bous, 1997, Matuszewich, 2007). Consequently, it is possible that individuals unable to complete training indeed experienced greater stress and anxiety at some point in time. Either to an extent they could not handle before training leading up to a *too calm-phenomenon,* therefore experiencing a peak in stress response early in the course. It is also possible that the strict inhibition of response during training leading up to the delayed expression of autonomic responses leading to the delayed effect of an *end-phenomenon*, therefore experiencing a peak in stress after the course ended.

The results from Study II regarding the effects of non-completion indicate that not completing a parachute training course was associated with not only the absence of the desired positive effects but with direct and sustained negative effects in leader self-control efficacy. Although small in sample size the non-completers group showed significant lower leader self-control efficacy than the completers at the end of the course and at the time of the follow-up measurement. Just as in Study I, only one sub-domain, leader self-control efficacy, significantly changed between the times of measurement. The sub-domain of leader assertiveness efficacy that increased in Study I decreased over time for the non-completers in Study II, although not significantly.

The results indicate that non-completion can influence restructuring of efficacy beliefs across domains in the same manner that increased beliefs have been shown to do. The positive generalization of self-efficacy has been argued to rest in large part on a *powerful mastery experience* (Fenz, 1975; Samuels et al., 2010, Ursin et al., 1978). It is possible that a similar but negative *powerful*

helplessness experience when the individual feels that the actions they take all lead to a negative result (Ursin & Eriksen, 2004; 2010) could cause a similar transformational restructuring of efficacy beliefs in disparate domains as well.

In summary, those who were unable to complete parachute training and those who did complete it were not different in any significant way. They did not vary either in regard to reasons for non-completion, demographical factors or any psychological variables tested. But just as completion could cause an increase in self-efficacy, non-completion was associated with decreased self-efficacy beliefs in disparate domains in a similar way.

Self-efficacy and developmental leadership

Although having a strong belief in one's ability to do something will generally lead to better performance in that domain (Sadri & Robertson, 1993; Stajkovic & Luthans, 1998) it is not the sole determinant of behavior. Moreover, leadership is not a single activity but a complex interaction among the leader, the subordinates and the contextual characteristics (Endler & Magnusson, 1976; Hannah et al., 2009; Osborn, Hunt & Jauch, 2002). In this regard, it was relevant to examine specifically how leadership self-efficacy was related to leadership of military leaders.

The results from Study III showed that leader assertiveness efficacy was a better predictor of the dimensions of the developmental leadership model, most noticeably the domains of exemplary model and inspiration & motivation. The sub-domain of leader self-control efficacy that was more associated with parachute training, were not as strongly associated to the leadership model as could have been expected. This result is interesting from several perspectives.

Retaining composure has been argued to be a central factor concerning leading others in difficult situations (McCormick et al., 2002; McCormick & Martinko, 2004; Murphy & Ensher, 1999). But it has primarily been related to facilitating cognitive control and functioning within a specific situation, in order to let the leader focus more on the task at hand rather than handling the inherent stress of the situation. Similarly, the ability to manage stress is one of the individual factors from the leadership model associated with effective developmental leadership (Larsson et al., 2003). But it works by making individuals master themselves under stress; it does not argue that managing stress in itself should be associated with the patterns of behavior comprising a certain leadership model. Samuels et al. (2010) defined the sub-components similar to this reasoning when stating that self-control efficacy contributes to efficacy for thought and self-motivation while assertiveness efficacy contributes to means and action.

Although all participants came from the armed forces, the respondents in the different studies varied in several ways. For example, the participants in

Study III were all experienced officers, whereas in Study I and II they were cadets. However, Study III participants were far from an extreme operational context at the time of sampling. Kolditz (2007a) points out that answers regarding for example motivation may vary between those who presently work in extreme settings and those who have done so sometime in the past. For future research it would be valuable to conduct research in a more operational context closer to combat.

It is interesting that age was a better predictor to two of the three dimensions of developmental leadership than any of the dimensions of leadership self-efficacy. Since the sample had a mean of 24.6 years of military service in leadership positions and on average 2 international deployments, age can perhaps best be viewed as a measure of leadership experience. The assertion that a greater amount of leadership experience can contribute to a greater level of developmental leadership is not hard to imagine. It is possible that with increased experience leaders act less on self-efficacy beliefs that they can do something and actual certain knowledge that they can do so. Such an explanation would mean that self-efficacy has a greater importance to bridge the gap between initial training and the early transition into the profession but loses predictive value with time and experience.

Overall, one possible interpretation of the results is that the parachute training is not as directly linked to leadership as hypothesized, but better viewed as something that can prepare individuals to master complicated and extreme situations. The self-control that individuals gain might be what enables them to function within an extreme context, but leader assertiveness can be what most determines the leadership behavior within that context. The level of assertiveness efficacy will probably be more closely related to how leaders plan, prioritize and execute, affecting the development of strategies and goals for any given leadership situation (McCormick, 2001). Retaining cognitive functioning can in effect be something that facilitates functioning in that context, including but not limited to asserting leadership and that age and experience more clearly defines the specific leadership behaviors. Although the data and chosen analytical method in the present thesis limit any conclusions in this regard, future research could benefit to more closely examine the relationship of how the different sub domains relate to both each other and to specific leadership behaviors in varying contexts.

Research on leadership self-efficacy and performance has often involved models including specific behaviors and environmental factors (e.g., McCormick, 2001; McCormick & Martinko, 2004). But less research exists on the connection to the dimensions of specific leadership models. Self-efficacy is sometimes included as one factor mediating specific leadership styles but has not necessarily been examined in terms of exactly how it affects specific domains within those leadership styles. In this regard, more remains to be done in order to understand the connection between leadership self-efficacy and

specific leadership models such as transformational leadership (Bass, 1999) or developmental leadership (Larsson et al. 2003; Larsson, 2006a).

In summary, retaining composure can be a vital function when leading in extreme situations but it seems to be assertiveness in making decisions that most influences specific leadership behaviors. The self-control to retain composure can be best viewed as what enables individuals to function in an extreme context, but the assertiveness in making decisions is what is more directly associated with specific leadership behaviors within that environment.

Methodological considerations

There are a number of methodological considerations relevant to this thesis. These concerns both theoretical and practical aspects of the research and are developed below.

A first methodological issue is the use of the self-efficacy concept in regard to generalizing and transfer between domains. In early works, Bandura (1977) used the term *transfer* to describe the effects on disparate domains, in that beliefs tend to "transfer not only to similar situations but to activities that are substantially different" (p. 195). In subsequent works the same phenomenon has been more thoroughly developed as *generalization* in describing that "what generalizes is the belief that one can mobilize whatever effort it takes to succeed in different undertakings" (p. 53). Subsequent works on the relation between self-efficacy domains have used the terms 'transfer' and 'generalization' interchangeably (e.g., Samuels & Gibb, 2002; Samuels et al., 2010). When discussing transfer, it is not to be regarded in the literal sense of moving something from one domain to another, but rather as the simultaneous development, side effect or spill-over to another secondary domain as a function of an increase in the primary domain in focus (Bandura, 1997). But the truth is that few studies employ this type of design, which can test this assumption specifically. For example, this thesis has not studied transfer or generalization between the primary domain of parachute self-efficacy to a secondary domain of leadership self-efficacy, but rather rests on accomplishment in one and measurement in another. As such, it cannot be certain that it constitutes a transfer, only that beliefs in a disparate domain increased as a function of a specific activity. Other methodological approaches have been utilized to study the direct transfer, with measurements across several domains measured equally. There have been examples of cross-sectional studies with parallel measurements of several domains (Massar & Malmberg, 2017) and other studies have utilized a longitudinal design with parallel and longitudinal measurements (Jackson & Dimmock, 2012) not focusing mainly on transfer but on self-efficacy as a mediator of performance. Most commonly, transfer is discussed in terms of observed and measured effects in different areas (Bandura, 1997; Bandura et al., 1969). When discussing overcoming the fear of public

speaking as the result of handling a boa constrictor, they did not study snake self-efficacy as a primary domain and public speaking self-efficacy as a secondary domain. The primary method of assessment was rather through the change from avoidance to approach behavior in an experimental setting and the ad-hoc reports of increased belief in overcoming other fear-provoking situations as a result (Bandura, 1977). Domain transfer as described by Bandura (1997) rests largely on power mastery experiences. It is the sense of accomplishment, not necessarily a high level of efficacious beliefs in the main domain, that can lead to the transformational restructuring of efficacy beliefs. Powerful mastery experiences exist on the basis that efficacy beliefs are lower than individual capabilities; the individual accomplishing something previously thought unlikely or even unimaginable. As such, it is more the mastery experience that can affect both domains simultaneously, not necessarily a transfer in the traditional or literal sense. It is also possible that the mastery experiences of parachuting have developed self-efficacy in domains not included in this thesis. Parallel measurements of self-efficacy in disparate domains together with additional measures of performance could possibly offer further insight into the transfer of efficacy beliefs.

In regards to stress, the term has been used to describe the stimulus, the physiological response and the cognitive abilities (Eriksen & Ursin, 2013). Using self-report measurements of stress and anxiety is efficient and inexpensive but is also a possible source for method bias where variations are the effect of the method of measurement rather than caused by the respondents (Campbell & Fiske, 1959; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). But using physiological measures also has disadvantages since what is actually being measured is sympathetic arousal and not necessarily the individual's experience of stress and anxiety. In addition, since self-efficacy is by definition related to the individual's perception of their abilities, self-report measures of stress and anxiety are arguably better in the same design. However, it should be pointed out that research combining physiological and psychological measurements of stress has been used in the neighboring area of training police officers for high-threat environments (Bertilsson, 2019). There are several areas where a combination of measurements could possibly offer further insight, for example the relation between the process of coping and the formation of efficacy beliefs.

Another question related to the results concerns gender differences, or more specifically the lack thereof. In the different analyses in the separate studies, gender has been one constant variable for comparison. Yet no effects of gender have been identified. Previous research has often found gender differences in self-efficacy research. For example, self-efficacy has often been found to vary between men and women in sporting and athletic activities (Lirgg, 1992; Spence et al., 2010) as well as in academic settings (Huang, 2013). But more importantly, gender differences have also been examined in the present field of leadership and how women rate their leadership self-efficacy (Robinson,

Ruggs, Huet & Medina, 2016). Such effects have also been argued to be strong within male-dominated working contexts (Eibl, Lang & Niessen, 2020), which has been presented as a factor contributing to difficulties integrating women in military organizations (Wood & Charbonneau, 2018). The military is arguably a male-dominated work environment. The proportions of women in the present thesis were 9.2%, 9.5% and 11% for Studies I, II and III respectively. This is slightly higher than the ratio of 8.8% female officers in the armed forces by the latest count in the annual report (Försvarsmakten, 2019). Consequently, one might have expected that women should express lower self-efficacy than men. The absence of gender differences could have different reasons. Those who choose to enter and retain in military service often do so to a greater extent based on certain values and beliefs (Bachman, Sigelman & Diamond, 1987) possibly contributing to a more homogenous sample by self-selection. In addition, the socialization process is arguably stronger in the development of military leaders than in other professions (Dalenberg & Bujis, 2013). These factors could reduce any gender differences in self-efficacy. Kolditz (2007a) argues that a more extreme context generally "reveals the true character" (p. 42) of an individual. In effect, individual tendencies to maintain facades or acting bravely or impervious to appear more "macho" are less likely to occur. In addition, there have been indications that the perception of the military as a macho environment could be more related to the stereotypical expectations from outsiders than actual factors inside the organization (Miller & Williams, 2001; Titunik, 2008). In his works, King (2013) argues that due to the professionalization of the modern military, cohesion in military units emerges to a large extent out of shared hardships, and that professionalism based on the mutual experience is a core component of integration. King (2013) gives numerous examples of when the more extreme settings of combat reduce social boundaries and reinforce a cohesion that is based on professional knowledge. Likewise, Junger (2010) in his observational studies of intense fighting in Afghanistan emphasizes the "clean" standard of the extreme situation and gives other examples of reduced social barriers, for example people of color and openly racist individuals overcoming their differences through shared experiences and meeting the same standards. Or as one soldier eloquently summarized: "it won't matter (who you are) because it's of no consequence in a firefight, and therefore of no consequence, period" (Junger, 2010, p. 234). It should be noted that from a practical perspective, the absence of gender differences is something positive, indicating that future military officers – both male and female – seem to possess the individual beliefs associated with leading in combat from maintaining the same standards and passing the same demanding training course. But it is impossible to draw any conclusions from the present results (or lack thereof) and the finding is relevant to examine in future research on training for and leading in extreme contexts.

Regarding the sample as a whole, one could always wish for more data, especially about those who were unable to complete training. However, restricted range and limited sample size is inherent to this type of research on real-life settings, the limitations being factual and not the effect of chosen design. Since it would be highly unethical to withhold training from individuals whose life might depend upon it, it would be impossible to implement strict experimental designs in this type of research and assign participants randomly to equally sized groups. Furthermore, it is evidently not possible to make individuals quit in order to better study the effects of non-completion. From a statistical standpoint, limited sample sizes often result in low statistical power and reduced reproducibility. In addition, comparison of unequally sized groups can impede the interpretation of mean values, which is one reason that confidence intervals were used (Cumming, 2012; Wiens & Nilsson, 2017). One could argue that the limited number of participants as well as use of self-selection present a group that is a restricted range of sample (which it is), which makes detection of possible differences more difficult (which it does). But the groups were still large enough to detect a significant difference in the outcome of training in regard to forms of self-efficacy in both Studies I and II.

One final issue to consider is the role and distance of the researcher and the study participants. An approach in following and observing the courses in uniform was selected. The reason behind this was to promote the individual's willingness to participate and add scientific insight into a setting rarely studied. An active presence communicates an interest and a sense of importance from both the organization and the researcher adding credibility to the research. Similar approach of researcher presence adding to high response-rates has been demonstrated in studies on police selection (Annell, 2012). Another issue was that undertaking the course oneself early in the military career and studying it from a scientific perspective are two completely different things. In this regard, observing the course in a new role was crucial – even necessary – in shifting perspective from soldier to scholar.

However, a possible negative side-effect of this approach is concerns about possible response bias. It is conceivable that the presence of a researcher in uniform to some extent shaped the responses of the participants. From another perspective, full unrestricted access to special units and hazardous training is rarely given to outsiders. Previous research has also shown that identification with the researcher can enable ingroup trust, prevent "party line"-answers and facilitate honesty in participant responses, especially in extreme military settings (Bar & Ben-Ari, 2005; Ben-Shalom, Lehrer & Ben-Ari, 2005). Future research could employ several researchers and possibly combine the access and ingroup trust of a researcher from the profession together with the unbiased perspective of an outside researcher and provide overlapping perspective for further insight.

Practical implications

The current thesis was initiated through a need to validate and investigate the effects of a system for training that had already been in place for more than 60 years (Bergman, 2006a). Consequently, the practical implications of the current work are not hard to find. There are however some issues that are worth mentioning regarding the implementation of the present research in military organizations and generalization to other professions.

Military parachute training is one of the most prominent as well as historically and internationally consistent methods of preparing future officers to lead in combat. But it is in no way the only one. On the contrary, such training represents two weeks out of three full years in the Military Academy and although a certain portion of the course will always be classroom teaching, much of the training to become an officer is aimed at personal development from a general leadership standpoint. Other more specific forms of training that have been studied are boxing and combative training (Samuels & Gibb, 2002). But arguably any training that can present a perceived threat to life and that requires active mastery can be used as a tool for personal development. One area that has many similarities to parachute training is training in survival, evasion, resistance, and escape – commonly referred to as SERE-training (Schmied et al., 2015). In a highly realistic mock prisoner of war-environment the individual is exposed to high levels of stress and anxiety from a perceived threat to life in an adverse context that requires adaptable coping skills to successfully master. Arguably, lessons from the present research could in many ways be applicable to this specific training course and others like it. At present, several parts of military instruction function on the same level as military parachute training based on an institutionalized belief *that* an effect exists more than scientific evidence of exactly *what* that effect is. Consequently, more work is needed to determine the usability of other aspects of training.

From a general standpoint, courses like parachute training function on the fine line between being challenging yet not traumatizing. If the context did not contain any perceived threat to life it would probably not cause the stress response needed to facilitate necessary coping skills as well as the development of self-efficacy. Yet if individuals are pushed too far it can have negative consequences that generalize to other areas just like the positive effects that they aim to achieve. This has not been discussed in any length in military settings, and more can be done to mitigate adverse consequences. Even the negative effects of non-completion can probably be turned into a positive outcome with the right tools. Even though special selection is utilized, everyone attempting training simply might not be suited either to parachuting or leading in combat. However, individuals undertaking training at the Military Academy represent a substantial investment in time and money, making it relevant from both from an individual and organizational standpoint to maximize their chances of suc-

ceeding. At present, there is no follow-up-program or systematic way to handle individuals who for any reason do not have the ability to complete training. Good examples of personal consideration have been observed by parachute instructors and teachers from the Military academy, but such efforts function on an individual basis and lack systematization. A simple follow-up program that could offer the opportunity to return at a later date and retry the course could be a simple tool in this regard.

Another point of concern is the absence of a systematic approach to guidance. Despite being directed toward the personal development of ability to function in high-stress environments, the training offers little guidance in handling stress specifically. Although much training is given in how to master the different practical aspects of parachuting, no formal instruction is given as to exactly *how* individuals can better psychologically cope with the high level of stress and anxiety. The approach from a coping standpoint is more of a psychological *sink or swim method* where the individuals either learn to cope during training or do not. No training or specific guidance is given in this regard. As noted by (Ursin et al., 1978) individual reactions to extreme training courses like parachuting will vary greatly and will always to some extent be dependent on antecedent conditions and a complex interaction among individuals in the group. In effect, there will also be a rich variety of specific strategies toward coping with the contextual demands, making the teaching of specific coping strategies problematic. But although there will probably always be a within-group variation as to specific strategies, there are more general approaches that could facilitate more specific strategies. Within the concept of stress inoculation training, Meichenbaum (1985; 2007; 2009) presents a number of tools such as relaxation training, general cognitive schemes, guided self-dialog etc. that could be applied as general resources to reduce stress in specific situations (Kashani, Kashani, Moghimian, & Shakour, 2015). Such techniques often build upon a rationale similar to the emotion-focused coping presented by Folkman and Lazarus (1984) which alters the way individuals experience situations in order to become less emotionally reactive. Specifically related to the parachute training situation, a study by Boe and Hagen (2015) showed that those participants who were given mindfulness training showed lower anxiety and higher self-confidence at different stages leading up to the parachute jump. It should also be pointed out that such general techniques are a critical factor in military settings in general, not only in parachute training, making them even more relevant.

Soldiers are not the only ones required to function in extreme contexts. The present research also has implications for numerous professions such as law enforcement, paramedics, fire-fighters, correctional services and other first responders. Several other professions work in more conventional contexts but could still be required to function in extreme situations. For example, the primary mission for airline pilots and flight attendants is to deliver passengers from A to B in a non-extreme manner. But in the unlikely event of a crash

landing or a hijacking they will be responsible for their own well-being as well as the passengers and preparing for handling such situations is necessary in their training (St. John, 1991).

But most professions work in contexts that are simply not extreme at all. Should leaders in more everyday professions learn to parachute? The simple answer is no. But the lessons from leadership in extreme contexts are valuable for leaders everywhere. For example, one point argued as vital for leading in extreme contexts are to embrace continuous learning because understanding the dynamics of the situation increases. Arguably, to embrace continuous learning can make leaders more adaptive to any context with a "work smarter, not harder" analogy (Kolditz, 2007a). Individuals who push themselves outside their own comfort zone will generally also become more resilient, making them comfortable with being uncomfortable, which in turn can make unexpected events challenging but not paralyzing. It will also facilitate the process of reflection on and re-examination of personal strengths, weaknesses and values, and an authentic leader who is more aware of their core beliefs is less likely to deviate from them (Gardner et al., 2005; Gardner, Cogliser, Davis & Dickens, 2011).

The present thesis has presented some insights into the process of leader development for future military officers, but more remains to be done. From a theoretical standpoint, the concept of transfer or generalization of efficacy beliefs as suggested by Bandura (1977; 1997) is not as defined or frequently studied as one might think considering the overall impact and influence of the social cognitive theory.

More can also be done in order to determine the specific influence of contextual factors on leader behaviors. From a practical standpoint there is a need for future studies to more closely examine similar training courses resting more on institutional knowledge than scientific evidence, and consider exactly how they contribute to leader development. Contexts such as parachuting and combat are naturally hard for researchers to study from a distance without some level of participation. For example, Steven Samuels was the first civilian professor at a military service academy in the United States to participate in and complete the military parachute training he would later go on to study. Additionally, several of the scholars frequently cited in this thesis, such as like Sean Hannah and Thomas Kolditz, are military officers who have served in leadership positions in combat and whose research often takes on a more hands-on, less abstract form. Emphasizing this this type of research is not meant to in any way disregard or disparage the important research being done from the side of the airfield and the battlefield, but rather to encourage more research on them.

Conclusions

The overall aim of this thesis was to investigate whether and how military parachute training can function as a method for leadership development. Because it is impossible to expose future military leaders to contexts that include any real threat to life, it is necessary to utilize training courses like parachuting that can simulate extreme stress as realistically as possible within ethical limits. What this thesis has shown is that parachute training can function as a method for preparing individuals to lead in combat, and the belief that they can retain composure when performing one task can generalize to a belief that they can retain composure when leading in combat as well, but exactly how that translates into specific leadership behaviors remains largely to be explored.

The type of training that this study has examined functions on the fine line between being challenging yet not traumatizing. It requires the extreme situation of a perceived threat to life in order to cause the stress response necessary to develop necessary coping skills as well as the powerful mastery experiences needed to increase the individual's belief in their own abilities to function in other situations. Completing different forms of parachute training seems to facilitate beliefs about other areas like leadership as well, where overcoming one difficult task can increase the individual's belief that other tasks with similar or even greater difficulty can be overcome similarly. What this thesis has also indicated is that just as *powerful mastery experiences* of completing such a course can increase individuals' beliefs in other areas, the *powerful helplessness experience* of not being able to complete such a course can cause a negative generalizing effect to other areas in the same way.

The effects of leadership training do not connect as directly to leadership behaviors as previously assumed. What this thesis has also indicated is that the individual's belief in their ability to retain composure can best be viewed as a factor that enables them to function within an extreme context such as combat, but that assertiveness and making rational decisions can be what most determines the leadership behavior within that context. Self-control seems to be related primarily to the facilitation of cognitive control and functioning within a specific situation, in effect letting the leader focus more on the task at hand than handling the inherent stress of the situation. Within that situation, the level of assertiveness seems to be more closely related to specific dimensions of specific leadership behavior and how leaders plan, prioritize and execute their actions.

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