

# Cognitive characteristics affecting rational decision making style

Charlotte Rosenberg



Master of Philosophy in Psychology

Department of Psychology

University of Oslo

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## **Abstract**

Decision making is one of the most important and frequent tasks among managers and employees in an organization. Knowledge about more stable cognitive characteristics underlying decision making styles has been requested. This study aimed to examine the relationship between rational decision making style, cognitive style, self efficacy and locus of control. Possible interaction effects in relation to gender were also analyzed. 186 employees at the Ministry of Defence were surveyed. Cognitive style, self efficacy and locus of control were significantly predicting rational decision making style. There was no interaction effect by gender found in this study. An individuals` approach and thinking practice when facing situations that require decision making, is of practical importance in relation to selection and placement, communication, counseling, team building, training and development.

## **Cognitive characteristics affecting rational decision making style**

It is generally agreed upon that decision making is one of the most important and frequent tasks that managers and employees engage in (Furnham, 2005; Greenberg & Baron, 2008). Drucker (2006) emphasized that it is a dangerous mistake to believe that only managers are engaged in decision making. Employees and leaders at all levels in an organization are continually engaged in decision making, and decision making is therefore an important skill regardless of which level in the organization it occurs at. Consequently, research on decision making in the context of work and organizational psychology is important. Decision making may be considered an exciting and complicated field because it draws on elements from both cognitive, social and personality psychology. Knowledge about decision making and related cognitive variables in organizations may be useful, especially in areas like personnel selection, training, assessments, placement and planning. It also helps to explain social interactions and conflicts in an organization (e.g. Leonard, Scholl & Kowalski, 1999).

Decision making can be seen as a process of making choices based on several existing options (Wedley & Field, 1984). Eight steps have been suggested to illustrate the process and the complexity that lies behind an analytical decision in an organizational context (Wedley & Field, 1984; Greenberg & Baron, 2008). First, an individual has to identify the problem, followed by defining the goals. The individual then makes a predecision concerning whether to solve the problem alone or search for others to contribute to the process. Next, the individual has to map out and generate alternatives of possible solutions, followed by an evaluation of these. Then, the individual has to choose one of the various solution possibilities that have been generated and implement it. Finally, the individual has to evaluate his or hers previous actions in order to monitor the effectiveness of the decisions that have been put into action.

It is important to notice that this process is a general model of analytical decision making in an organizational context. All decisions do not necessarily follow each step of the process (Wedley & Field, 1984; Greenberg & Baron, 2008). Because decisions are made on the basis of previous decisions, decisions being made in the present may have consequences for future decisions and certain alternatives that used to be possible are no longer an option due to prior choices (Harris, 1998).

Decisions in work and organizational life are affected by factors that are located at three different levels of analysis: individual level, group level and organizational level.

This paper examined individual differences in decision making and looked at various cognitive variables which might contribute to the understanding of the individual's rational decision making style (Furnham, 2005; Scott & Bruce, 1995; Greenberg & Baron, 2008; Thunholm, 2004).

Research on decision making was initially concerned about whether humans were rational actors and made decisions on a normative basis (Kahneman & Tversky, 1979). Recent research has increasingly focused on how people actually make decisions. Decision tasks and decision situations have been in focus (Loo, 2000). A normative approach has been replaced by a more descriptive approach (Hastie & Dawes, 2001). Both of these approaches gave little room for individual differences in decision making (Thunholm, 2004). Decision making style is a concept implying individual differences in decision making focusing on characteristics of the decision maker (Loo, 2000). Differences refer to how much information a decision maker has collected or to procedures being used in further processing of collected information. The concept has been applied particularly in the field of career development and vocational behavior, but not so much in the field of decision making (Scott & Bruce, 1995).

Various conceptualizations of decision making style can be found in previous research. This implies that the understanding and operationalization of the concept has been under a certain change. Driver (1979) claimed decision style to be a habitual pattern. Harren (1979) was concerned about features on how individuals perceive and react to a decision making task. Driver, Brousseau and Hunsaker (1990) focused on the amount of information gathered and also the number of alternatives the decision maker considers when a decision is being made. Mitroff (1983) was concerned about individual differences when it comes to making sense of information gathered. Scott and Bruce (1995) supported that decision making style is a habit-based response pattern and not a personality trait. Driver, Brousseau and Hunsaker (1990) highlighted that people tend to prefer one style (primary style), but also have the possibility of using other styles (secondary style). Singh and Greenhaus (2004) expanded this view by claiming that individuals have a repertoire of strategies they can apply. The researchers also pointed at the possibility of using a combination of strategies. Thunholm (2004) called for a wider definition of decision making style. In his study of Swedish military officers he emphasized some mental abilities are theoretically related to decision making. He found that rational decision making style can be partly predicted from measures of self esteem and action control. He also noted that decision making style entails basic self-evaluation and self-regulation. In relation to the findings, he suggested a more holistic understanding of the concept of decision making style. He claimed that the whole individual has to be considered.

He assumed there are more stable character variables of a decision maker. In the light of Thunholms findings, there is a lack of research with regard to understanding psychological mechanisms, cognitive abilities and more stable cognitive characteristics underlying different decision making styles. Gati et al. (2009) supported Thunholm in his assumptions that describing decision making calls for a wider understanding and definition. In their study they used profile instead of style to indicate the complexity of the construct. Style is a concept representing more stable characteristics of a decision maker. The use of profile also indicted the importance of both personality and situational influence when it comes to decision making behavior.

The present study analyzed the quantitative data of employees at the Norwegian Ministry of Defence. Participants were surveyed in relation to rational decision making style, cognitive style, locus of control and self efficacy. The possibility of gender as a potential moderator, was included in this study. As an introduction to this study, the various cognitive constructs will be presented along with the concept, content and research.

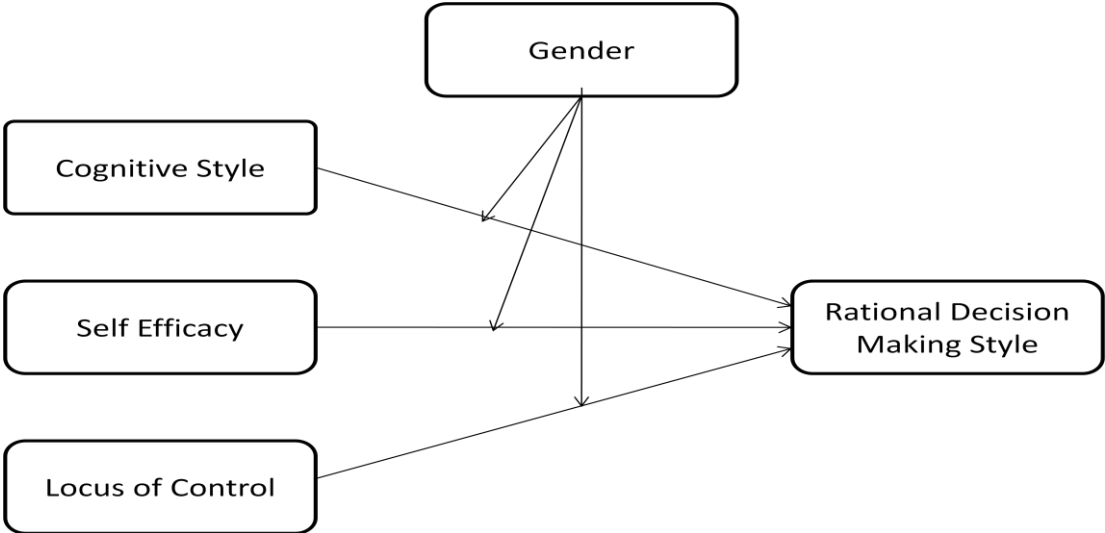


Figure 1. Hypothesized model

This study contributes to the field of research in three ways. First, the study investigates the relationship between cognitive constructs that contribute to an individual's rational decision making style. With a new, more holistic definition on decision making style, more research is needed to understand cognitive contributors to this concept. Second, this study examined gender as a possible moderator between the predictors, cognitive style, self efficacy and locus of control, in relation to decision making style. More research which includes the gender perspective on these cognitive constructs is required. Third, most research in this field has been conducted in the USA. This study is based on a sample of Norwegian employee`s at all levels in an organization, contributing to ascertain the generalizability of previous findings.

### **Rational decision making style**

Scott and Bruce (1995) distinguished between five different decision making styles. These styles reflect an individual's approach to different decision making situations. The rational decision making style is characterized by the use of a logical and structured approach to decision making. The search for information, the assessment of information, and evaluation of the information are all carried out in a logical manner. An avoidant decision making style is the opposite of a rational approach. This style is identified by trying to postpone a decision situation and to avoid making a decision. The dependent style is characterized by individuals seeking information and advice from others before a decision is taken. Intuitive decision making style is of a more emotional character because the individual listens to the feelings and impressions in a decision situation. Finally, a spontaneous decision making style seeks to finalize a decision process as quickly as possible.

The main focus in this paper is the rational decision making style. A rational approach to decision making has been extensively researched in previous studies (Scott & Bruce, 1995; Thunholm, 2004). It has been described by an extensive way of searching for information. When gathering information a rational decision maker tends to focus on details. The extensive manner of searching for information results in a large amount of information that has to be considered. The decision maker actively and consciously search for this information, and generate several alternative solutions to the problem. The generated alternatives are subjected to a logical assessment. Decision makers who prefer a rational approach to decision making have a sense of personal responsibility and control. They also have a greater sense of confidence when facing challenges (Thunholm, 2004; Scott & Bruce, 1995). Approaching a problem rather than avoiding a problem, is also a feature of rational decision making (Loo,



2000). According to McKenny and Keen (1974), the information gathering of a rational decision maker is recognized by using existing concepts and known cognitive categories when filtering the data. When facing a challenge, a known method that often leads to a solution, is preferable. Innovative behavior is not related to a rational approach. The systematic way of facing a decision reduces the possibility of innovativeness. There is some evidence for rationality being limiting when it comes to generating alternative ways of solving a problem (Scott & Bruce, 1995). Gati et al. (2006) conducted a study in order to find out where in the decision making process individual differences have an effect, and found that information gathering and structuring of the gathered information are of importance. Further, recent research (Galotti et al., 2006) has shown that an individual's affective responses in relation to the decision making process, as vital with respect to individual differences.

Gender differences have been reported in personality and cognitive domains. Consequently, Loo (2000) suggested that there may be gender differences in decision making styles. In a study of management undergraduates, no gender differences were found in relation to decision making styles. This may be due to the sample being homogeneous and that a selection had already taken place (Loo, 2000). Individuals seek congruence between their personal style and their environments. When searching for a job, people may tend to apply for positions in organizations they believe match their own personal style (Scott & Bruce, 1995).

Much of the research involving gender differences has been devoted to consumer decision making and ethical decision making (Mitchell & Walsh, 2004). In terms of personality traits relevant for decision making, men tend to be more independent and confident than women (Areni & Kiecker as cited in Mitchell & Walsh, 2004). Further, men have been reported to be more field independent than woman. Individuals characterized as field independent have an ability of separating objects or phenomena from its surroundings. They also prefer to emphasize details in their problem solving. Such field independence has been related to a rational decision making style (Mitchell & Walsh, 2004). Field dependent individuals, on the other hand, do not show the same ability to separate objects or phenomena from its surroundings. Instead, they utilize more intuitive and global approaches when they solve problems (Henderson & Nutt, 1980).

Park (1996) assumed that depending on whether individuals have a masculine or feminine role identity, they would have different preferences regarding decision styles. He found that individuals with masculine role identity preferred a decision style that is more task-oriented and analytical in nature, while individuals with a feminine role identity were more relational and conceptual in their decision making style. Risk willingness in various decision

making situations has also been studied in relation to gender differences. Women have been found to be less willing to take risks in financial decision making processes than men (Powell & Ansic, 1997; Mitchell & Walsh, 2004). Men can be assumed to be more impulsive than women because impulsivity in decision making is associated with risky behavior (Donohew et al., 2000). Impulsivity, in turn, is related to a spontaneous decision making style, not to a rational approach. In sum, men have been found to be more field independent than women, implying that men have a more rational decision making style than women. However, men have also been found to be more impulsive and risk willing than women, which is not related to a rational approach. Thus, research has resulted in contrasting findings.

### **Cognitive style and rational decision making style**

Allport was probably the first to use the term style in relation to cognition (Riding & Cheema, 1991; van den Broeck, Vanderheiden & Cools, 2003). The content of the construct has been formulated in different ways, but most of the definitions entail a typical or habitual way of organizing and processing information which is rather consistent across situations and tasks. Guilford (1980) claimed the cognitive style to be a trait, representing a more stable construct. Cognitive style affects our way of solving a problem, thinking, perceiving and remembering (Riding & Cheema, 1991; Allison & Hayes, 1996). There have traditionally been three different ways of viewing cognitive style. First, a structured approach implies a focus on stability over time and situations. A second view is to consider cognitive style as a process that involves changes. The third view is a combination of the two previous views and implies that cognitive styles are of a more dynamic character (Riding & Cheema, 1991).

An early contribution regarding cognitive style stems from Jung (1970). He developed a typology representing a conceptualization of different cognitive styles. Jung claimed that there are individual differences in how people perceive and judge their surroundings. Perception is concerned with sensing or intuition, while judgment has to do with thinking or feeling. This represents two different dimensions and reflects four different cognitive styles: SensingThinking, SensingFeeling, IntuitionThinking and IntuitionFeeling. The cognitive style SensingThinking represents a directly way of perceiving the world through the senses, and the perceptions will be judged in an analytical way. The cognitive style SensingFeeling represents the same directly way of perceiving the world, but the judgement of the sensory process is of a more affective character. The cognitive style of IntuitionThinking concerns a more holistic way of perceiving the surroundings, and the judgment process is of a more rational character. The last cognitive style defined by Jung, IntuitionFeeling, entails a preference for a holistic

way of perceiving, while judging the perceptions in a more affective manner. This typology has been used as a framework in both cognitive style and decision making style (Anderson, 2000; Thunholm, 2004).

Cognitive style has traditionally been viewed as a bipolar dimension (Witkin & Goodenough, 1981) revolving around the dimensions of rational versus emotional style, or analytical versus holistic style (Van der Broeck, Vanderheyden & Cools, 2003). Allison and Hayes (1996) claimed to have identified up to 29 separate cognitive styles. Factor analyses suggested more than one dimension, but it is challenging to get valid and reliable measurements when the number of dimensions increases. Allison and Hayes (1996) differentiated between the intuitive and the analyst style. Intuitive style is characterized by knowing without the ability of being aware of how or why they know. The feeling of knowing may be experienced as an immediate sense. Analysts, on the other hand, prefer to break a problem down to its parts and collect as much information as possible. They also prefer a systematic way of analyzing the challenges. In recent years, however, there have been new contributions regarding cognitive style, such as metacognition (Kohlodnaya, as cited in Kozhevnikov, 2007). Cognitive style is then viewed as a psychological mechanism which is responsible for both controlling and regulating an individual's cognitive functioning. Consequently, researchers have thus far not agreed on a definition of cognitive style. In addition, several researchers have pointed out that the literature concerning cognitive style has been largely descriptive. The consequences of this have been an inadequate theoretical base (Walker, 1986; Kozhevnikov, 2007).

In the last decades, the organizational literature has considered cognitive style to be an important factor in studying organizational behaviors such as decision making, conflict handling, strategy development and group processes (Leonard, Scholl & Kowalski, 1999). Individual differences in cognitive styles have been regarded as important in relation to influencing perception, learning, decision making, communicating and information processing (Messick, 1984; Witkin & Goodenought, 1981).

Knowledge about an individual's cognitive style may be helpful when it comes to improving the quality of decision making. Areas of application are many, like selection and placement, learning performance, communication, counseling, team building, training and development (Hayes & Allison, 1994). Sadler-Smith and Badger (1998) claimed cognitive style to be a fundamental determinant for both individual and organizational behavior, manifesting itself in actions committed by an individual in the organization and in organizational systems, processes and routines. Having knowledge about an employees`

cognitive style, can help leaders and employees themselves to succeed because this entails knowledge concerning where in the organization the employee might be most suitable due to their cognitive style. Such knowledge further provides insight as to why people who have the same abilities, skills and knowledge may perform differently (Streufert & Nogami, as cited in Kozhevnikov, 2007). When employees are aware of their own and other's cognitive style, they might get a better understanding of their own and other's performances which, in turn present them with the possibility to build on strengths and balance weaknesses (Edgley, 1992). There are no good or bad styles, only different styles that entail different strengths and weaknesses (van der Broeck, Vanderheiden & Cools, 2003). This implies that different cognitive styles may be appropriate for different tasks (Mintzberg, 1976). Further, having such knowledge might encourage respect for diversity (Leonard & Straus, 1997).

The analytic approach strongly resembles the rational approach of decision making (Hunt et al, 1989). Hunt et al. (1989) examined the relationship between the decision makers' thinking practice reflecting their cognitive style, and the decisional process. The cognitive styles of the respondents were measured, and they were then asked to judge a scenario. Results showed that respondents' preferred decision strategies differed as a function of the decision maker's cognitive style. The study found the tendencies of intuitive respondents to prefer intuitive strategies, and analytic respondents to prefer analytic strategies. Thus, I posit the following hypothesis:

*Hypothesis 1: Analytic cognitive style is positively associated with rational decision making style.*

Research on cognitive style was particularly popular in the 1970's. At that time, gender differences were often included in the research (John Head, 1996). However, the amount of research on gender differences regarding cognitive style decreased later on. This decrease may be explained by two factors. First, it was pointed out that cognitive style is a rather vague construct. The second factor was the influence of a feminist way of thinking about gender differences where gender differences were attributed to either discrimination or women having fewer opportunities than men.

When gender differences once again became a topic, differences were often related to the concepts of field independence and field dependence. Field independence and field dependence have, in turn, been related to terms such as analytic and intuitive in areas like problem solving and decision making. Individuals categorized as analytic/field independent

will focus more on details and prefer breaking what is observed into its components. Field dependent/intuitive individuals prefer to comprehend the field as an integrated whole, a more global approach in relation to problem solving and decision making (Hunt, et al., 1989; Henderson & Nutt, 1980). Field independence has more often been related to men than women (Mitchell & Walsh, 2004). Kogan (1976) claimed that the evidence for women being more field dependent than men is overwhelming. Previous research in the field of gender differences has displayed different results. Some have found support for hypotheses that suggest the social stereotype of women being more intuitive than men (Agar 1986), while other studies imply the opposite (Kirton, 1989). The majority of studies point in the direction of men to be more intuitive than women (Taylor, 2003). Allison and Hayes (1996) found support for the latter. In their studies, women were found to be more analytic than men in all their samples.

In sum, women are assumed to be more analytic than men in their cognitive style. Analytic cognitive style, in turn, is assumed to be positively related to rational decision making. Consequently, gender may influence the relationship between cognitive style and rational decision making style, in accordance with the following hypothesis.

*Hypothesis 2:* The relationship between cognitive style and rational decision making style is moderated by gender. The relationship is stronger for women than for men.

### **Self efficacy and rational decision making style**

Self efficacy was derived from social cognitive theory claiming that human functioning depends on the interplay between personality, behavior and environmental factors (Bandura, 1986). Bandura introduced the concept of self efficacy in the late 1970s. Self efficacy is a specific construct (Zimmerman, 2000) and the individual's own beliefs about his or hers ability in a specific situation, is of concern (Rosenstock, Strecher & Becker, 1988). Self efficacy influences how people think, behave, feel and motivate themselves. Bandura claimed that perceived self efficacy was a contributor to cognitive development and functioning through cognitive, motivational, affective and selection processes. Self efficacy implies cognitive, social, behavioral and motivational capabilities being appropriately and effectively organized (Bandura, 1992).

An individual's perceived self efficacy affects which activities and environmental surroundings he or she chooses. People prefer to find themselves in situations they believe

they are able to cope with. Believing in overcoming a challenge will release efforts to actually do so, despite any obstacles. On the other hand, not believing in overcoming a challenge in the given situation, results in little effort being put into trying (Bandura, 1977).

The ability to cope also affects an individual's thought patterns and emotional responses when an individual interacts with the environment. Having little faith in managing a given task results in greater difficulties because the individual starts dwelling on his or her incompetence (Sarason as cited in Bandura, 1982). The construct has been of interest in the field of work - and organizational psychology as well, especially in career development (Taylor & Popma, 1990). It has been particularly applicable when it comes to the understanding of career development in women (Lent & Hackett, 1987).

Bandura (1982) argued that there are four particular sources of information regarding self efficacy. The most influential source is called enactive attainments. This source is based on previous coping experiences. If an individual has experienced a defeat, this will reduce his or her faith in coping. If the experience of not succeeding happens early in the course of events, it cannot be explained by having investing little time and effort to succeed. It will therefore contribute to a further reduction of the individual's self efficacy. Experiencing success, on the other hand, will result in enhanced self efficacy. The second source influencing our assessment of self efficacy is called vicarious experience. If an individual sees that people similar to him or herself who succeed, this will affect what he or she thinks is possible to achieve (self comparison) (Zimmermann, 2000). If an individual sees people similar to him or herself who failed, it can affect him or her with impaired ability to cope (Brown & Inouye, 1978). Thirdly, a very commonly used method to get people to believe in themselves and their opportunities is verbal persuasion. Verbal persuasion is not as influential as the two other sources. If the individual initially has a certain belief that he or she can do the task, verbal persuasion works best (Chambliss & Murray, 1979). Finally, humans also use psychological states to assess their capabilities. Inner arousal is used as a measure of the ability to master. Feeling a high internal arousal can be interpreted as a sign of vulnerability, and coping beliefs are consequently reduced. When an individual experiences high arousal, his or her performance may weaken as well as his or her expectations of success. Hence, enactive attainments, vicarious experience, verbal persuasion and psychological arousal can be considered as indicators of our ability to master (Bandura, 1982).

The association between a rational decision making approach and self efficacy has been noted in a research by Mau (2000), who focused on career decision making styles in relation to self efficacy. The study found that the rational decision making style was positively

associated with self efficacy measures. This implies that a preference for rational decision making is related to higher self efficacy. Previous cross-national studies have received support for Americans being more self-enhancing, and Asians tend to be more self-criticizing (Kitayama, Markus, Matsumoto & Norasakkunkit, 1997). In the study by Mau (2000), Americans tended to have higher self efficacy than Asians. Thus, self efficacy may be subject to cultural differences. Bandura (1977) claimed that individuals who consider themselves as competent are categorized as having high self efficacy. Perceiving self-competence and control are important parts of a rational approach to decision making (Scott & Bruce, 1995).

Julien (1999) focused on different barriers adolescents reported to meet regarding information seeking in relation to career decision making. Respondents lacking confidence perceived a barrier in seeking help to make career decisions, and their feeling of self efficacy diminished. The rational approach to decision making is characterized by a systematic search for information, a high degree of information searching and searching for a lot of information does not require much effort of a rational decision maker. In this study, more respondents categorized as rational decision makers, more frequently reported to face no barriers than any of the respondents with other decision making styles. Overall, rational decision makers reported a slightly lower degree on both internal and external barriers regarding information seeking.

Previous research on the relationship between self efficacy and decision making has been particularly concerned with career decision making self efficacy and vocational indecision (Taylor & Betz, 1983; Taylor & Popma, 1990). Research on indecision can illustrate the relation between a rational approach to decision making and self efficacy. Mau (2000) and Scott and Bruce (1995) have noted a negative relationship between indecision and a rational decision making style. Taylor and Betz (1983) found that career decision making self efficacy was significantly related to the vocational indecision. Low self efficacy was related to higher scores on vocational indecision. Taylor and Popma (1990) found similar results. In their study, low scores on career decision making self efficacy were moderately and negatively related to the vocational indecision, while moderate positive relationships were found between higher scores on career decision making self efficacy and vocational decidedness. Hence, career decision making self efficacy was a significant predictor in relation to vocational indecision. The researchers could not observe any gender differences in this study. A challenge to operationalize indecision has been the distinction between indecision as a temporary state and indecisiveness as a more stable personality trait that does not vary as much across situations and difficult decisions. A reasonable way to separate these

concepts has been in a retro perspective. Indecision is negatively related to a rational decision making style (Scott & Bruce, 1995). Mau (2000) found that a rational decision making style and self efficacy were negatively related to career indecision. However, a measurement of career decision making self efficacy was found to be more a general measure of self efficacy than a specific measure of behavior in relation to career decisions (Robbins, 1985). Thus, measures of career decision making self efficacy may be used to measure general self efficacy.

A reasonable prediction will be that the construct of self efficacy and rational decision making style will be positively related. Thus, I posit the following hypothesis:

*Hypothesis 3:* High self efficacy is positively associated with rational decision making style.

Previous research in relation to gender differences and self efficacy has left mixed results. Gender differences were an aim in the study by Julien (1999). Women reported perceiving more internal barriers (psychological and intellectual) and external barriers (institutional and physical) than men. Further, there were twice as many men than women who claimed facing no barriers at all in relation to seek information.

In contrast, Taylor and Popma (1990) did not find any gender differences in their study regarding the relationship between career decision making self efficacy and vocational decision making. Bush (1995) used college students in order to investigate their perceived self efficacy regarding different tasks on computers. In simple tasks performed on the computer, no gender differences were found. When the tasks became complex, however, gender differences were found. Men were reported to have higher computer confidence than women (Busch, 1995). Previous research on gender differences have left conflicting results in relation to specific tasks regarding computers (Koochang, 1989). Lower self efficacy has also been reported for women in relation to math-related subjects and to subjects that traditionally have been dominated by men (Betz & Hackett, 1981).

Previous research in psychology and sociology has shown that in our part of the world, men tend to have a greater sense of self efficacy than women (Gecas, 1989). It has further been pointed out that men have a stronger feeling of controlling the world around them, and they believed that they have higher self efficacy than women Gnechten (1978). High self efficacy, in turn, is suggested to be positively related to rational decision making style.



Consequently, it is possible that the relationship between self efficacy and rational decision making style is moderated by gender. Thus, I posit the following hypothesis:

*Hypothesis 4:* The relationship between self efficacy and rational decision making style is moderated by gender. The relationship is stronger for men than women.

### **Locus of control and rational decision making style**

Locus of control is characterized as a personality variable (Spector, 1988). Human learning theory was of importance when the concept was developed, yet it was characterized as a relatively stable individual difference (Rotter, 1989). Locus of control was initially developed as an attempt to explain why some people do not respond in the expected rate of rewards or punishment. Rotter (1954, 1966, 1989) believed the reason that the expected responses were missing was a person's general expectation that their actions would not result from the achievement of reward or avoidance of punishment. Individuals attributing control of events to causes beyond themselves, are referred to as externals. Individuals who explain the reason for the control of incidents by referring to factors in themselves, personal factors, are called internals. This implies that internals have a belief that they can control events, while externals do not believe they have control over events because there are factors outside themselves that are of importance to the outcome. Harvey, Barnes, Sperry and Harris (1974) found that internals see more choices in relation to externals. Kabanoff and O'Brian's (1980) research also pointed out that internals feel more in control of situations than externals and that they also increasingly seek situations where there are several options for control. Weiner (1992) highlighted the concept of locus of control in his attribution theory. His theory involves beliefs and expectancies regarding success. Causal attributions are significant in relation to engagement in different activities. An individual's attributions in relation to achievement outcomes, will be of importance when it comes to how much input he or she invests. In this matter the causal attributions will constitute motivational beliefs (Eccles & Wigfield, 2002).

The concept of locus of control may be viewed in the context of several organizational variables (Spector, 1982; O'Brian, 1983). Generally, motivation, attitudes, and behavior have been related to locus of control in organizational settings (Spector, 1982). More specifically, achievements in work life, problem solving, conformity, effort, perceptions, compliance with authority, well-being at work, and job satisfaction been seen in relation to locus of control

(Spector, 1982, 1988; Spector, Cooper, Sanchez & O`Driscoll, 2002). Internals tend to be more satisfied with their work, they report less stress and feel they have more control and autonomy. They also seek information more actively than externals and are less likely to conform. Internals are more concerned with information than they are of social demands in different situations. When internals are not satisfied with their current situation, they become active and try to make changes (O`Brien 1983; Spector, 1988). Many studies from the 1970`s considered locus of control in relation to problem solving and learning. These studies pointed out that internals show better achievements compared to externals (DuCette & Wolken, 1973; Ude & Vogler, 1969; Wolken & DuCette, 1974).

The association between decision making and locus of control, was depicted in a study by Hashimoto and Fukuhara (2004). The main issue underlying their study was about a patient`s attitude when it comes to seeking information and decision control. As previously noted information gathering and structuring is necessary part of rational decision making. Individuals who have an experience of control in relation to their own health outcome, categorized as internals, will probably adopt a problem-oriented coping strategy. They are assumed to seek information more actively and utilize a rational problem solving strategy. Those who believe that they have less control, categorized as externals, will seek less information regarding their health outcome. They trust other powerful people, seek emotional relief or make use of reframing in accordance to adapt to the situation. The results from Hashimoto and Fukuhara`s (2004) study showed that for internals, the preferences for information were positively associated with decision preferences (in accordance with rational decision theory). The more surprising findings in this study was that for externals, there was no or a negative association between the variables of preferences for information and decision preferences. In accordance with internals developing more alternatives in problem solving, internal locus of control correlates positively with a rational decision making style and correlates negatively with innovative behavior (Scott & Bruce, 1995; Russ et al., 1996). Thus, I posit the following hypothesis:

*Hypothesis 5:* Internal locus of control is associated with rational decision making style.

No differences between internals and externals have been found with regard to acquiring information. Phares (1968) only found a difference in terms of how the information were used in relation to complex problem solving. Research on gender differences in relation

to the general construct of locus of control has left mixed findings. There are studies indicating women to be more external in their expectancies than men (Gurin, Gurin & Morrison, 1978; Itzhaky & Riebner, 1999). Other studies have revealed the opposite result (Jayaratne & Ivey, 1983). In addition, some studies have found no differences when it comes to gender in relation to locus of control (Holder & Vaux, 1998; Lengua & Stormshak, 2000). Studies making use of the domain specific instrument Work Locus of Control Scale (e.g Blau, 1993; Orpen, 1992; Spector & O'Connell, 1994), have not focused on the aspect of gender (Muhonen & Torkelson, 2004). When it comes to environmental factors, Furnham and Drakeley (1993) noted that individuals having less access to power, material advantages or opportunities, will most likely develop external expectancies. This illuminates the importance of environmental factors in relation to locus of control (Muhonen & Torkelson, 2004). Men tend to be at the higher organizational level than women in Europe (Davidson & Burke, 2000). Muhonen and Torkelson (2004) noted the possibility of gender differences in relation to expectancies having originated from differences in access to power.

Internals tend to have a sense of control and mastery when facing different situations (Rotter, 1954, 1966, 1989). This attitude has a resemblance with a rational decision making style. Previous research noted that women turned out to be more rational in their approach than men. With this in mind, an association between rational decision making and internal locus of control, can be influenced by gender. Muhonen and Torkelson (2004) found no gender differences according to work locus of control in their study of the relationship between work locus of control, stress and health. Mixed findings regarding gender in relation to locus of control, and the lack of focusing on gender when using the domain specific instrument, can make it difficult to predict and detect differences in the relationship between locus of control and rational decision making style for men and women.

Thus, I posit the following hypothesis:

*Hypothesis 6:* The relationship between locus of control and rational decision making style is not moderated by gender.

## **Method**

### **Sample and Procedure**

Data were collected by means of an electronic questionnaire. The questionnaire was prepared

in collaboration with a fellow student. We split the data set and wrote separate papers on different questions (Alsvik, 2011). The questionnaire was sent out to 314 employees at the Norwegian Ministry of Defence, of which 186 were returned ( $N = 186$ ), giving a response rate of 59%. In total 65 women and 121 men participated in this study. 112 respondents (60,2%) reported to have a civilian background, of which 58 of the respondents were men, and 54 of these respondents were women. 74 respondents (39,8%), reported to have a military background. 63 of these respondents were men and 11 of these respondents were women.

The questionnaire contained scales from existing and validated instruments measuring rational decision making style, cognitive style, self efficacy and work locus of control. These were originally in English. I translated all items into Norwegian, while Alsvik did a back translation into English. The result was compared with the original items, and any differences were adjusted. Questions regarding the respondents` gender and occupational background (civil/military) were placed at the end of the questionnaire. The survey was sent out to the employees` individual e-mails. Along with this e-mail was an introduction from our affiliate at the Ministry of Defence with information regarding our project and of the Ministry`s need for research in this field, as well as a brief description of the cooperation we had with the Ministry of Defence. Participants were informed that all responses were anonymous and that they could not be traced either to the individual or department level. They were further informed that it was voluntary to participate in this study. Information about where to ask for further information if required was also included. Participants were informed of the main topic of the project, decision making, while specific information about the cognitive constructs that was measured, were not given. A reminder was sent out two weeks after the initial administration of the survey to those participants who had not yet responded.

## **Measures**

*Rational decision making style:* Rational decision making style was measured with the rational subscale of the General Decision Making Style Scale (GDMS) developed by Scott and Bruce (1995). The subscale consists of four items. A sample item is “I make decisions in a logical and systematic way.” Respondents were asked to indicate to which degree they agreed with the items on a 5- point Likert scale. (1: “strongly disagree”, 5: “strongly agree”). A high score on this measure, reflect a rational decision making style.

The original findings regarding reliability as reported by Scott and Bruce (1995), were  $\alpha$  ranging from .77 to .85 (Scott & Bruce, 1995). A high score on this measurement, reflect a rational decision making style. In the present study, rational decision making style had an alpha value of .67, which is minimally acceptable. The inter item correlation was .35 which is within the recommended range from .20 to .40 (Briggs & Cheek, 1986).

*Cognitive style:* Cognitive Style Index (Allison & Hayes, 1996) consists of 38 items. Answers are given by choosing one of three options, “true” – “unsure” – “false”. Scores on this measure can range from 0 – 76 depending on the points the respondents is given for each item (0,1 or 2 points per item). Scoring is based on an intuitive-analytical dimension of cognitive style. High scores reflect an analytical style. An item from this scale may be exemplified with, “In my experience, rational thought is the only realistic basis for making decisions.” Cronbach`s alpha in this study was .82. In the study from Allison and Hayes (1996) and other reliability data for the Cognitive Style Index, revealed Cronbach`s alpha values between .84 - .92 (C.Allison, personal communication, January 26, 2011).

*Self efficacy:* New General Self Efficacy Scale (NGSES) was developed by Chen, Gully and Edon (2001). This new version has a better construct validity than the original General Self-efficacy Scale. NGSES consists of 8 items. Answers were given on a 6-point Likert scale.(1: “stongly disagree”, 6: “strongly agree”). The items measured an individuals` belief in his/hers own capabilities. A sample item from this measure is, “I will be able to achieve most of the goals that I have set for myself.” The measure is scored by averaging the ratings across the 8 items. Consequently, scores can range from a low of 1 and a high of 5. A high score represents high self efficacy. Cronbach`s alpha in the present study was .91. Reliability in the original study was high,  $\alpha = .86$  and .90 (Chen, Gully & Edon, 2001).

*Locus of control:* The Work Locus of Control Scale consists of 16 items that map a generalized assumption about the degree of control an individual experiences with regard to work life. An example of an item from this scale is, “Most people are capable of doing their jobs well if they make the effort.” On the basis of a conceptual analysis of the general concept of Rotter`s term locus of control, the items are generated in relation to how the general term related to the behavior in the workplace (Spector, 1988). Answers are given on a 6-point Likert scale, (1: “stongly disagree”, 6: “strongly agree”). Scores on the scale can range from 16 – 96 points. High score on this measurement represents an external orientation. A reliability test of the scale in the present study, revealed an  $\alpha = .84$ . General findings concerning the general consistency ( $\alpha$ ) in the English version of the scale, range from .80 - .85 (P.E. Spector, personal communication, January 25, 2011).

## **Analysis**

The data obtained from the questionnaires resulted in a dataset which was analyzed using SPSS 18. Hierarchical multiple regression with moderation was used to test the hypothesis corresponding to the nature of the research question.

Tabacknick and Fidell (2007) recommend five important issues in accordance to screen the data prior the analysis. The first issue concerns accuracy of the data file. The second issue focuses on honest correlations and the accuracy of the correlations. The third issue is about evaluating the distribution of missing data. The fourth issue concerns inspection of outliers. The fifth issue deals with inspection of normality, linearity and homoscedasticity.

In order to screen the data on the basis of these recommendations of Tabacknick and Fidell (2007), the dataset of descriptive statistics was checked in accordance to accuracy of the data file on behalf of the input. All items included in the survey were mandatory, leaving no missing data. One of the assumptions of regression analysis is that the data is normally distributed (Tabacknick & Fidell, 2007). To meet this requirement, distribution of all scales were assessed and variables were explored by generating histograms and Q-Q plots.

The distribution of cognitive style, work locus of control, general decision making style (avoidant approach) was acceptable. The distribution of scores on General Self Efficacy Scale was slightly negatively skewed with the long tail to the left, indicating that more people score high on self efficacy. This may be due to the underlying nature of the construct and does not necessarily indicate any problems with the scale. An additional inspection of the normal Q-Q plot was done and found satisfactory. Transformation of the variable was not performed.

Statistical techniques can be sensitive to outliers. Checking for possible univariate and multivariate outliers was therefore conducted. The histogram and box plot were investigated and some outliers were identified. A further inspection of the mean score and the 5% trimmed mean score were compared for all variables to check whether the extreme scores did have any strong influence on the mean. This comparison showed no substantial differences in the mean score and 5% trimmed mean score of the variable, and so cases were retained in the data file. Inspection of normal P-P plot of the regression standardized residuals and the scatterplot of the standardized residuals, revealed no violation on the assumptions of normality, linearity and homoscedasticity.

All independent variables were centered. The benefits of centering scores include reducing the problem of multicollinearity which can be a problem in models using moderation. According to Tabacknick and Fidell (2007), multicollinearity occurs when

variables are highly correlated, from .90 or above. The interaction effects were computed by multiplying the centered scores with the moderator variable, gender. This was done for each independent variable and left three new variables in the data file to use in the further regression analysis. A problem then arose with multicollinearity; gender correlated highly with these new interaction variables which have been created by multiplying the dependent variables with gender. To account for this, moderation variables were removed from step 4 and 6 in the regression model. These steps will not be reported on in the result section and tables.

## **Results**

Descriptive statistics with means, standard deviations, correlations and reliability estimates for all variables included in the analysis are reported in Table 1.

Hierarchical multiple regression was used to assess to which extent Cognitive Style Index, General Self Efficacy Scale and Work Locus of Control Scale predicted Rational Decision Making Style, while controlling for the influence of occupational background (civilian/military). Gender was assessed as a moderating variable (Table 2). First, occupational background was entered as control variable, and did not significantly explain variance in rational decision making style. In the second step all predictor variables were entered: cognitive style, self efficacy and work locus of control, and gender. The total variance explained by the model as a whole was 21.1%. This is a statistical significant contribution,  $F(16.51) = 9.650, p < .001$ . R square change was 19.5%, representing the effect after controlling for occupational background. In the third step, the interaction variable with cognitive style and gender was entered. The model as a whole explained 21.9% of the variance in rational decision making style. The overall variance explained by variables included in this step was not a significant contribution with a R Square Change of 0.8%. The interaction variable with general self efficacy and gender was entered in step five. The total variance explained by the model as a whole was 21.5%. R Square Change was 0.4. This step represented not a significant contribution. In the last step the interaction effect with work locus of control and gender was entered. The model explained 21.6% of the variance in the dependant variable. This was not a significant contribution. The value of R Square Change was 0.5% in this step.

Table 1

*Means, Standard Deviations, Correlations and Reliabilities*

Variable	M	SD	1	2	3	4	5	6
1 Background	.40	.49						
2 Gender	.65	.48	.34**					
3 Rational Decision Making Style	15.92	2.09	-.13	-.11	(.67)			
4 Cognitive Style	42.73	11.23	-.11	-.07	.35**	(.82)		
5 General Self Efficacy	37.74	5.48	.07	.01	.19*	-.15*	(.91)	
6 Work Locus of Control	40.99	9.51	-.08	.05	-.16*	.08	-.27**	(.84)

*Note.* Cronbach`s Alpha (scale reliabilities) are reported on the diagonal in parentheses.

\*Correlation is significant at the 0.05 level (2-tailed).

\*\*Correlation is significant at the 0.01 level (2-tailed).



Tabel 2

*Hierarchical Multiple Regression Analysis Predicting Rational Decision Making Style*

	Step 1 $\beta$	Step 2 $\beta$	Step 3 $\beta$	Step 4 $\beta$	Step 5 $\beta$
<b>Control variable</b>					
Occupational Background	-.13	-.10	-.11	-.10	-.10
<b>Main Effects</b>					
Cognitive Style (CSI)		.38***	.27*	.37***	.37***
General Self Efficacy (GSE)		.21**	.22**	.29**	.22**
Work Locus of Control (WLOC)		-.14*	-.15*	-.15*	-.23*
Gender		-.04	-.37	.37	-.34
<b>Interaction Effects</b>					
Interaction effect,CSI x gender			.36		
Interaction effect,GSE x gender				-.43	
Interaction effect,WLOC x gender					.33
<b>R Square</b>	.02	.21	.22	.22	.22
<b>R Square Change</b>	.02	.20***	.01	.00	.01
<b>F</b>	3.06	9.65***	8.37***	8.17***	8.23***

\*p < .05. \*\*p < .01. \*\*\*p < .001

Cognitive style, general self efficacy and work locus of control each were significant contributors to the prediction of rational decision making style. Cognitive style was the most important contributor ( $\beta = .38$ ). The second most contributing factor was general self efficacy ( $\beta = .21$ ), followed by work locus of control ( $\beta = -.14$ ). There were no significant contributions from any of the interaction effects (Table 2).

Hypothesis 1 predicted a relationship between rational cognitive style and rational decision making style. Cognitive style was a significant contributor ( $\beta = .38, p < .001$ ), thus hypothesis 1 was supported. Consequently, high scores on CSI, reflecting analytical approach, were related to high scores on rational decision making style. Gender was proposed to moderate the effect of cognitive style on rational decision making style (Hypothesis 2). The interaction effect with cognitive style and gender, was not supported ( $\beta = .36$ , not significant). The results showed that gender did not moderate the relationship between cognitive style and rational decision making style, and hypothesis 2 was therefore not supported.

Hypothesis 3 predicted a relationship between high self efficacy and rational decision making style. High scores on the general self efficacy scale, reflecting high self efficacy, are related to high scores on rational decision making style. Self efficacy was a significant contributor ( $\beta = .21, p < .01$ ), lending support to hypothesis 3. Gender was suggested to moderate the relationship between general self efficacy and rational decision making style in hypothesis 4. The results did not find the interaction effect of general self efficacy and gender to be significant ( $\beta = -.43$  not significant). Thus, hypothesis 4 was not supported.

Hypothesis 5 predicted a relationship between internal locus of control and rational decision making style. Locus of control was a significant contributor ( $\beta = -.14, p < .05$ ), and hypothesis 5 was therefore supported. Consequently, high score on rational decision making style was related to a low score on work locus of control, reflecting an internal approach. Hypothesis 6 suggested that the relationship between work locus of control and rational decision making style would not be moderated by gender. The results supported this hypothesis because the interaction effect of work locus of control and gender on rational decision making style was not significant ( $\beta = .33$ , not significant). Thus, gender did not moderate the relationship between locus of control and rational decision making style.

All main effects turned out to be significant contributors to the dependant variable, and there were no moderation effects of gender in the relationships.

## **Discussion**

The purpose of this study was to examine the relationship between rational decision making style and relatively stable individual cognitive characteristics like cognitive style, self efficacy and locus of control. Results from the present study supported previous research and theory which have noted an association between the constructs. This study focused on the extent to which cognitive style, self efficacy and locus of control can predict the variance in rational decision making style. Cognitive style turned out to be the best predictor in relation to rational decision making style. The study also aimed to identify possible influences by gender in the relationships between rational decision making style and analytical cognitive style, rational decision making style and high self efficacy, and rational decision making style and internal work locus of control. In this study no influence by gender was found.

The main constructs in this research, rational decision making style, cognitive style, self efficacy and locus of control, reflect different characteristics of an individuals` approach and thinking practice when facing situations that require decision making. Human decision making is of a judgmental character which implies a process. Few decisions are of a mechanic nature. This acknowledgment of decision making as a process (Hunt et al, 1989), may have contributed to the change in the definition of decision making style and the growing interest in research on individual differences and cognitive factors in relation to the concept of decision making style (Thunholm, 2004).

### **The association between cognitive style and rational decision making style**

Hypothesis 1 predicting an association between analytical cognitive style and rational decision making style, was supported. Previous research has noted the association between cognitive style and decision making style (Hunt et.al, 1989; Thunholm, 2004). In studies on individual differences regarding decision making, the term cognitive style and decision making have been used interchangeably. Individual differences in decision making style have been partially explained by differences in cognitive style (Anderson, 2000). The reason for the relationship between the constructs can have its justification in a common typology from Jung (Thunholm, 2004; Anderson, 2000) that researchers have utilized in their research and theory development regarding individual differences in this field. "Psychological Types" is probably one of Jungs` best known work. It has been applied as theoretical framework in leadership and organizational life (Anderson, 2000). The point of departure for Jung is that types can not be found in the pure depicted forms. The typology from Jung rests on two different main elements, attitude and functions. Jung claimed that there are three dimensions

in the psyche of humans. These dimensions are attitudes (extrovert versus introvert), perception functions (sensing and intuition), and judgement functions (thinking and feeling). It is the latter element that is of importance in this context of cognitive style and decision making. The function element, consisting of perception and judgment, deals with how people judge a problem after having perceived it. Jung described function as a psychic action form. He claimed this psychic action form to be in principal the same, even under a variety of conditions (Thunholm, 2004; Anderson, 2000). According to Jung, thinkers are described as analytical and logical. They are also depicted to be precise. They are not very concerned about the emotional aspects. Feeling types are, in contrast to thinkers, concerned with feelings. They do not value analysis, but prefer their own values. They also like to cooperate with other people much more than thinkers do. Jung claimed that all people prefer one of the four functions (sensing, intuition, thinking or feeling). The preferred function is called dominant and represents the strength of that person. The opposite function is named the inferior function and represents the weakness of that person. A person with thinking as the dominant function, will have feeling as the inferior function. Anderson (2000) argued that the two factors of the function element, perception and judgment, can be seen as decisive for an individuals` decision making style. Because cognitive style and decision making style share this typology, an association between the constructs is comprehensible.

The relationship between cognitive style and rational decision making style was significant. The contribution was not very high despite the close theoretically connection between the constructs. This may be due to the fact that decision making style involves both an individuals` thinking practice as well as factors of a more general ability nature and habitual patterns (Thunholm, 2004; Scott & Bruce, 1995). Such habitual patterns are not easy to predict, which might explain the relatively low prediction value of cognitive style.

### **The association between self efficacy and rational decision making style**

Hypothesis 3 predicting an association between high self efficacy and rational decision making style was supported. Consistent with previous research, high self efficacy was associated with a rational decision making style (Mau, 2000). Similarities in the process of the search for information found in respondents with high self efficacy and respondents with a rational approach to decision making, have been noted by Julien (1999). Other aspects of both a rational decision making style and high self efficacy are perceived controllability and capability. Individuals with a rational approach to decision making and high self efficacy have been depicted and characterized with a sense of control and capability. Bandura (1993)

highlighted two aspects of controllability. The first aspect concerns the individual, and the other aspect deals with the environment. The individual's experience of self efficacy in order to make changes based on their own resources represents the first aspect. The second aspect illuminates the possibilities and limitations of self efficacy permitted by the environment. Having little faith in one's own capabilities, provides little change even in an environment which is not limiting. In one study, Bandura and Wood (1989) gave individuals different information regarding the possibility of changes in a group. Some individuals were primed to believe that group behavior was easy to influence, while others were told that group behavior was not easy to influence. Those who were told that group behavior was easy to influence demonstrated high self efficacy. They did not lose faith in their own capabilities. Despite obstacles, demanding goals were set and the participants took advantage of good analytic thinking. This research demonstrated the importance of high self efficacy in relation to goal setting and analytic thinking.

Bandura (1993) claimed that human motivation is generated from cognitive factors. First, an assumption or belief in possible actions is formed. The individual then evaluates the potential outcomes of the different actions. Next, the individual sets goals and makes plans regarding how to attain the desired outcome. Bandura noted three forms of cognitive motivators: causal attributions, outcome expectancies and cognized goals. Corresponding theories to these cognitive motivators are attribution theory, expectancy-value theory and goal theory. Self efficacy is a factor in all of these different shapes of cognitive motivation. Several studies have highlighted the association between self efficacy and causal attribution (e.g., Alden, 1986). Attribution theory suggests that individuals in possession of high self efficacy will attribute failures to insufficient effort. Individuals in possession of low self efficacy will attribute failures to low ability. The second theory, expectancy-value theory, illuminates the expectation of outcomes. Certain behaviors will lead to an outcome, and the value of that outcome is of importance. How people tend to behave depends on their self efficacy. The behavior is also influenced by assumptions of outcomes (Bandura, 1989, 1993; Eccles & Wigfield, 2002). The third theory concerns goals, as well as motivation through self satisfaction by fulfilling attractive goals. If the performance does not seem to lead to the desired goal, resources and efforts are increased to reach the goal. Locke and Latham (1990) noted that setting challenging goals will both enhance and sustain motivation. The aforementioned study by Bandura and Wood (1989), noted the importance of goal setting and analytic thinking. High self efficacy may operate as a motivational factor in all of these three ways in relation to analytic thinking and a rational decision making style, and Bandura and

Wood (1989) observed the importance of goal theory in relation to a rational approach of decision making. In Wedley and Field`s (1984) overview of the rational decision making process, three main steps were identified: formulation, consideration and determining. In the formulation of the problem, defining goals is an essential part. Defining goals implies that a possible solution is easier to identify. When facing a challenge, a known method that often leads to a solution, is preferable in a rational decision making process (Mc Kenny & Keen, 1974). Certain behavior will lead to an outcome which is positively evaluated at that time in the process. In order to define goals a certain way of gathering and structuring of the information, has to be done early in the process. High self efficacy and rational decision making style share important features in this matter. The way of gathering and structuring information, constitutes a rational method and that enables a continuation of such a rational process. Goal setting guides the process further in a rational manner. Similarly to rational decision making, high self efficacy may also involves goal setting.

The findings in the present study, implying a significant relationship between the two constructs, can be viewed in the light of goal setting theory.

### **The association between locus of control and rational decision making style**

Hypothesis 5 predicting an association between internal locus of control and rational decision making style was supported. Locus of control was a significant contributor in relation to rational decision making. The two concepts share theoretical similarities. Both are relatively consistent concerning an individual`s way of thinking. The development in the understanding of rational decision making style has moved from being seen as a habitual pattern toward a more trait like phenomenon (Scott & Bruce, 1995; Thunholm, 2004). Locus of control has been characterized as a personality variable (Spector, 1988), indicating a certain stability across situations. Locus of control represents a generalized expectancy about control. Control is either attributed to internal (personally) causes or to external causes (sources outside oneself). Internals feel a sense of control, but externals do not have that sense of control, it is rather a matter of luck (Spector, 1988; Rotter, 1966). Weiner (1992) argued that individual`s explanations (causal attributions) in relation to achievement outcomes are decisive in relation to how much effort a person invests. This represents an important motivational factor. Attributions are by Weiner (1992) classified into three different causal dimensions; locus of control with its poles of internal versus external beliefs, is one of those dimensions. In addition Weiner (1992) noted stability and controllability. Stability refers to whether there is a change resulting from causes or not over time. Causes one can control may

be exemplified by skills and efficacy; in contrast causes one can not control include mood, what other people do, aptitude or luck. All of these three factors are of importance in relation to motivation and behavior. (Eccles & Wigfield, 2002). Decision making behavior which is depicted as a rational approach to decision making, requires an individual to have a sense of a personal responsibility, skills and control (Thunholm, 2004; Scott & Bruce, 1995), and rational decision makers prefer to approach a problem rather than avoiding a problem (Loo, 2000). The two constructs, internal locus of control and rational decision making style, share attributions concerning controllability and personal responsibility. The attribution theory may shed light on the significant association between internal locus of control and rational decision making.

Locus of control turned out to be the least significant contributor in this study. Krolick (as cited in Spector, 1982) found that internals increasingly changed their scores in a more external orientation when they recently had an experience of not succeeding. Externals however, did not change their score in the direction of more internals when they had experiences of success. Phares (1976) claimed that internals are more sensitive when it comes to information that is relevant to them than externals. The study by Krolick is in contrast to a longitudinal field study conducted by Anderson (1977). He found that a shift in terms of locus of control, happened both in those characterized as externals and internals. Social learning theory was the theoretical background when Rotter introduced the concept of locus of control (Rotter, 1966). A change in locus of control on the basis of new experiences is in accordance with the theoretical background of Rotter (Muhonen & Torkelson, 2004). This may indicate that locus of control is not as consistent across situations and experiences, and therefore turned out to be of less significance when it comes to prediction of rational decision making style. Locus of control turned out to be a significant predictor of rational decision making style, but cognitive style and self efficacy were better predictors. Cognitive style and self efficacy have probably demonstrated more consistency across situations and experiences than locus of control (Allison & Hayes, 1996; Bandura, 1982; Rotter, 1989). It is important to not forget that locus of control is embedded into human learning theory. Locus of control is not a trait which is fixed, it is a generalized expectancy. Principles of human learning theory, generalization and a gradient of generalization, must be taken into account. Several studies have illuminated the lack of specificity. Rotter noted that some researchers have forgotten the starting point for the concept, the human learning theory (Rotter, 1989).

### **Interaction effects by gender**

It was predicted that there would be an interaction effect of gender in the relationship between analytic cognitive style and rational decision making style (Hypothesis 2), and between high self efficacy and rational decision making style (Hypothesis 4). It was further hypothesized that there would not be any interaction effect by gender in the relationship between locus of control and rational decision making style (Hypothesis 6). There were no interaction effects in any of these relationships. The lack of interaction effects in the relationships between analytic cognitive style and rational decision making style, and between self efficacy and rational decision making style, may be due to the fact that gender differences in this organization are limited because employees have already been selected as part of the recruitment and selection process when they were hired. Thus, the sample used in this study might be more homogeneous than the actual population. The number of men participating in the study, was higher than the number of women. This may also contribute to the lack of finding any interaction effects. Gender differences in relation to cognitive style and rational decision making have also been reported to be difficult to detect because they are varying in different samples, and the nature of cognitive style has been criticized for being a rather vague construct (Loo, 2000). The challenge of reduced consistency across situations and experiences in locus of control, may be an explanation for the non significant gender interaction effects in the relationships between internal locus of control and rational decision making style.

### **Limitations**

A threat to the validity of this research is the low reliability on the subscale measuring rational decision making style. The reliability was lower than in other studies (Loo, 2000). Low reliability can result in difficulties regarding comparison between studies because findings may vary due to the measure being used and not actual variations. Rational decision making style was the main construct in this and a better reliability of the scale was desirable. However, because inter item correlations were adequate this was not considered a major problem.

The generalizability of the findings from this research is limited. The Ministry of Defence may constitute a more homogenous environment that is not comparable with the population. People working at the Ministry of Defence have a higher level of education than the population. There are more men than women working at the Ministry, and the turnover rate in the Ministry of Defence is rather low. This may provide few challenges in relation to



the existing culture, and this may contribute to a homogenous environment. Therefore, future research should consider other contexts and different organizational cultures when investigating similar relationships as those investigated in the present study.

There were 121 men and 65 women who participated in this study. The large number of men participating in this study can be a limiting factor in relation to detect gender differences. Samples consisting of more equal numbers of men and women, would be of interest to investigate in relation to decision making style, cognitive style, self efficacy and work locus of control.

Since this was a multivariate regression analysis, it was not possible to make a confident conclusion concerning the causal relationship between rational decision making style and the cognitive variables that constitute the predictors-, cognitive style, self efficacy and locus of control. Using other methods for analyzing the data can enrich the understanding and interpretation of predicting rational decision making style. Limitations concerning the use of self report measures may entail faking good. Further, the participants were surveyed at one point in time. Their responses may therefore have been somewhat different than had they responded at another point in time. Time of measurement may also have influenced the responses because employees in this organization tend to have a high work load and limited time to spend on other things such as responding to a survey.

### **Future research**

There are a limited number of studies that make use of Work Locus of Control Scale in relation to gender differences (Muhonen & Torkelson, 2004). This domain specific instrument has promising psychometric properties, and would be of interest to apply in relation to gender as well. Applying the instrument in different contexts with men and women in different positions and organization levels, would be of interest.

Future research could identify and explore other cognitive contributors to a rational decision making style. In the light of Thunholm (2004) findings, there is a lack of research when it comes to understanding psychological mechanisms, cognitive abilities and more stable characteristics underlying different decision making styles. Further research regarding different cognitive contributors, would shed additional light on important areas of work and organizational life like personnel selection, training, assessments, placement and planning. Investigation of different cognitive variables in relation to other decision making styles like spontaneous style, avoidant style and dependent style is required. Most research has focused

on rational style and intuitive style (Thunholm, 2004). Further research on the other styles may contribute to a more comprehensive understanding of the concept of decision making styles.

There is a need to clarify the relationship between decision making styles and different barriers experienced in relation to information. Different ways of searching for information has been an important factor for distinguishing the decision making styles (Driver, 1979). In order to clarify the relationship between different kinds of barriers that people perceive regarding seeking information and different decision making styles, more research is needed. Decision making styles in relation to perception would be of interest (Julien, 1999).

### **Practical implications**

Knowledge concerning cognitive characteristics that affect decision making in organizations are useful in relation to areas like personnel selection, training, assessments, placement within an organization, and planning. Such knowledge may further contribute to increased understanding of social interactions and conflicts in an organization.

When selecting people for different jobs, knowledge concerning what those jobs entail and require, as well as the applicant`s cognitive makeup, may be useful. Having such knowledge may help ensuring that the chosen candidate fits well with the organization both in terms of work tasks to be done, desired and required competencies, and relational aspects. Organizations that use measures to acquire knowledge of individual differences in cognitive variables in selection processes or in relation to training, should consider using specific measures that predicts specific behavior rather than more general measures. Personality tests, representing more general measures, are frequently used in selection and training, but may not provide detailed information which the organization might benefit more from. Rather, it is suggested that organizations may benefit more from using specific measures of cognitive variables such as those used in this study. Further, knowledge concerning the cognitive characteristics of an applicant makes it easier for the organization to understand the most appropriate placement of the individual within the organization and ensure that the individual`s abilities and competencies are put to the most efficient use.

Several decision support systems in form of computer programs have become available, which organizations might benefit from using because they have the potential to help individuals solve their work tasks more efficiently. However, the individual differences in relation to decision making style and cognitive makeup place different requirements on the

support systems. Therefore, it is important to have knowledge regarding employee`s different cognitive approaches if such computer programs are to be used successfully.

Cognitive variables may be seen as different ways of how individuals prefer to manage their work assignments. Thus, knowledge regarding an individual`s cognitive characteristics is important when considering composition of teams in organizations. Working with people that have very different preferences and approaches might be more challenging for the individual when working in teams. However, some diversity in cognitive approaches is desirable. Knowledge concerning cognitive characteristics of the employees may therefore contribute to a successful and balanced composition of teams.

Further, it is important to value different approaches when facing and solving work assignments. A rational approach is not always the answer. It is important to see both the limitations and possibilities of different approaches. There are some theories pointing at the rational process as limiting innovative behavior (Scott & Bruce, 1995). Several work tasks require behavior of a more innovative character. Thus, different cognitive approaches might be most suitable for different types of work tasks.

## **Conclusion**

Decisions in work and organizational life are affected by factors that are located on the individual level, group level and organizational level of analysis. This paper aimed to highlight factors located on an individual level. 186 employees at the Ministry of Defence were surveyed regarding their decision making style, cognitive style, self efficacy and locus of control. The most important findings in this study were that rational decision making style was significantly related to cognitive style, self efficacy, and locus of control. Cognitive style, self efficacy, and locus of control also proved to be significant predictors of a rational approach to decision making independently of each other. Cognitive style was the strongest predictor of rational decision making style. There were no interaction effects regarding to gender in these relationships. Following the realization that there are significant individual differences in terms of cognitive approaches, knowledge concerning such differences is important for organizations with regard to selection, training, placement within the organization, and composition of teams.

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