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경영학석사학위논문

**A STUDY ON THE RELATIONSHIP BETWEEN WORK  
COMPLEXITY AND DIFFERENT TYPES OF CREATIVITY**

업무 다양성과 서로 다른 형태의 창의성의 관계에 대한 연구

2013 년 2 월

서울대학교 대학원

경영학과 경영학전공

ANDREAS ANTEFELT

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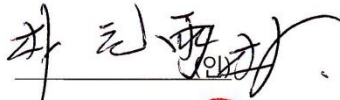
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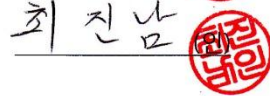

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# **ABSTRACT**

## **A STUDY ON THE RELATIONSHIP BETWEEN WORK COMPLEXITY AND DIFFERENT TYPES OF CREATIVITY**

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The relationship between work complexity and creativity has since long been established in creativity research, often explained through a mediating process of intrinsic motivation. An important premise of this relationship has been that of creativity as a unitary construct. However, more recent conceptual work on creativity distinguishes between conceptually different types of creativity. This has brought about calls for alternative and more nuanced perspectives on the processes that bring about creativity. Consequently, the overarching purpose of this study was to make a contribution to creativity research by examining the argument that work complexity is related to conceptually different types of creativity, specifically proactive and responsive creativity. By doing this, this study expands the commonly used intrinsic motivation approach through the use of alternative and opposing theoretical perspectives. In order to accomplish this, this study considered alternative mediating psychological mechanisms underlying the relationship between work complexity and different types of creativity, specifically psychological empowerment and cognitive overload. Finally, ambiguity tolerance as a moderator of the relationship between work complexity and psychological states was an integral part of this study given its potential to affect individuals' immediate psychological response to work complexity and its entailing consequences.

Data were collected in both Sweden and South Korea and the final sample consisted of 143 independent dyads of focal employees and their supervisors from a diverse range of organizations and industries including general management, manufacturing, R&D, and sales. Hypotheses were examined through several sets of hierarchical regression analyses. Standard statistical procedures were adopted to test for the presence of mediating as well as interacting and moderating effects.

With partial support for the proposed model, the results of this study showed that work complexity indeed has the potential to stimulate different types of creativity, explained through separate psychological processes. These results are consistent with earlier research following the intrinsic motivation-approach, but also indicate that alternative frameworks might indeed be called for. This study also found that an individual's level of ambiguity tolerance moderates the relationship between work complexity and the psychological response. These findings provide implications for both managers and researchers by suggesting possible ways for organizations and managers to act depending on the desired or required type of creative effort. Finally, directions for future research were discussed.

**Keywords:** work complexity; ambiguity tolerance; cognitive overload; psychological empowerment; proactive creativity; responsive creativity

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# TABLE OF CONTENTS

- CHAPTER I: INTRODUCTION ..... 1
- CHAPTER II: THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT ..... 4
  - 1. Work Design Theory and Job Characteristics ..... 4
  - 2. Creativity ..... 9
  - 3. Self-Determination Theory ..... 12
  - 4. Activation Theory ..... 13
  - 5. Psychological Empowerment and Cognitive Overload ..... 15
  - 6. The moderating role of Ambiguity Tolerance ..... 22
  - 7. The moderating role of Innovative Cognitive Style and Supervisor Support for Creativity ..... 24
- CHAPTER III: METHODS ..... 30
  - 1. Sample and Procedures ..... 30
  - 2. Measures ..... 33
  - 3. Analytical strategy ..... 35
- CHAPTER IV: RESULTS ..... 37
  - 1. Descriptive statistics ..... 37
  - 2. Hypotheses testing ..... 39
- CHAPTER V: DISCUSSION ..... 52
  - 1. Overall findings ..... 52
  - 2. Implications ..... 58
  - 3. Limitations ..... 59
- CHAPTER VI: CONCLUSION ..... 60
- REFERENCES ..... 61
- ABSTRACT IN KOREAN ..... 71

## LIST OF TABLES

Table 1. Summary of sample .....	32
Table 2. Means, standard deviations, and inter-scale correlations .....	38
Table 3. Hierarchical regression examining the mediating effect of Psychological Empowerment in the relationship between Work Complexity and Proactive Creativity.	42
Table 4. Hierarchical regression examining the mediating effect of Cognitive Overload in the relationship between Work Complexity and Responsive Creativity .....	43
Table 5. Hierarchical regression examining the moderating effect of Ambiguity Tolerance in the relationship between Work Complexity and Psychological Empowerment.....	45
Table 6. Hierarchical regression examining the moderating effect of Ambiguity Tolerance in the relationship between Work Complexity and Cognitive Overload.....	46
Table 7. Hierarchical regression examining the moderating effect of Supervisor Support for Creative Performance and Innovative Cognitive Style in the relationship between Psychological Empowerment and Proactive Creativity .....	49
Table 8. Hierarchical regression examining the moderating effect of Supervisor Support for Creative Performance and Innovative Cognitive Style in the relationship between Cognitive Overload and Responsive Creativity .....	50
Table 9. Summary of results .....	51

## LIST OF FIGURES

Figure 1. Research Model.....	29
Figure 2. Interaction of Work Complexity and Ambiguity Tolerance on Psychological Empowerment.....	47
Figure 3. Interaction of Work Complexity and Ambiguity Tolerance on Cognitive Overload .....	47



## **CHAPTER I: INTRODUCTION**

Creativity has been labeled a necessary step to achieve competitive advantage (Amabile, 1988; Shalley, 1995) and contribute to the survival, innovation, and effectiveness of organizations (Amabile, 1996; Nonaka, 1991; Oldham & Cummings, 1996; Scott & Bruce, 1994). In general usage, creativity often refers to the ability of people to combine ideas in a unique way or to make unusual associations between ideas, but the most common definition is nevertheless that of creativity as the production of novel ideas that are potentially useful and appropriate to the situation (Amabile, 1996; Shalley et al., 2004). Given its potential and importance for organizations, creativity has been given substantial attention both among practitioners and researchers (Shalley et al., 2004).

In a work setting, creativity has been argued to be a function of the employee's personal characteristics, the characteristics of the context in which he or she works, and also the interactions among these characteristics (Shalley et al., 2004). Within the broader framework of contextual characteristics, the design of jobs have for a long time been considered to be an important contributor to creative behavior through job enrichment, where certain job characteristics, such as the degree of complexity and challenge in the job, has been argued to be a critical influence on employees' work motivation. Motivation then acts as a driving force for behavior with subsequent positive effects on a number of work related outcomes, including creativity (Hackman & Oldham, 1980). The relevance of the relationship between job characteristics and creativity is perhaps greater than ever before in an era when the nature of work has become increasingly complex due to global competition, job restructuring, and general changes in the organizational landscape while creativity and innovation has emerged as some of

the most critical means for organizations to create value for their multiple stakeholders (Shalley et al., 2009; George, 2007).

Although previous studies generally supports the hypothesized relationship between work complexity and creativity (e.g., Amabile & Gryskiewicz, 1989; Oldham & Cummings, 1996), contending studies have reported that a number of contingent factors often present in the contemporary work environment, such as time pressure, supervisor interference, and high workload pressure, have a detrimental effect on creativity (Amabile et al., 1996), which makes the previously hypothesized relationship between work complexity and creativity somewhat questionable. Indeed, scholars have argued in favor for the need of a more nuanced perspective on creativity as well as increased attention on how seemingly opposing processes might interact to bring about creativity, in contrast to the dominant focus of the intrinsic motivation approach (George, 2007).

Most of the earlier research on the link between job characteristics and creativity is based on the premise that creativity is a unitary construct, thereby hindering a complete understanding of the processes and drivers behind engaging in creativity (Unsworth, 2001). Attempts have been made to further distinguish between different forms of creativity, such as the recognition that creative ideas can range from minor adaptations to radical breakthroughs (Mumford & Gustafson, 1988). Subsequent research on the same topic has argued that creativity can be categorized according to two different dimensions and how they vary, namely the driver for engagement and problem type (Unsworth, 2001). This categorization recognizes the multidimensional nature of creativity and furthermore implies that different types of creativity are not only conceptually different, but also that the process and antecedents leading up to the different forms of creativity also differ. Altogether, these ideas are an important contribution to

creativity research but remain largely untested empirically (Shalley et al., 2004). Taken together, this brief introduction indicates that the consideration of alternative interpretations on previously hypothesized relationships between work complexity and creativity are justified.

Consequently, this study had three main purposes. The first purpose was to examine the argument that work complexity is positively related to conceptually different types of creativity as the preceding introduction suggest. The second purpose was to examine a more fine-grained interpretation of the creativity engagement process where it is acknowledged that individuals' psychological response to work complexity and the route leading up to the different types of creativity are different, by using an interactionist approach considering both contextual and individual factors. The third purpose was to examine ambiguity tolerance as a moderator of the relationship between work complexity and psychological states. Overall, this argumentation implies that the motives and drivers behind engaging in different types of creative behavior differ, and with this approach the general ambition was to make a contribution to the research field in question, which often has assumed an either-or, one-way route approach regarding the relationship between work complexity and creativity.

## **CHAPTER II: THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT**

### **1. Work Design Theory and Job Characteristics**

Creativity in the work setting has generally been argued to be a function of the employee's personal characteristics, the characteristics of the context in which he or she works, and the interactions among these characteristics (Shalley et al., 2004). The impact of contextual characteristics on creativity is a multifaceted construct with a number of different components, but a central role within this has been the work place. Theories of work design have played a substantial role given the importance of how individuals relate to their jobs and the possibilities given by engaging in work redesign to improve performance and creativity (Hackman & Oldham, 1976). Especially job enrichment, where employees are given the opportunity to use a range of abilities in different tasks through so called vertical loading, has often been studied given its potential to enhance the level of intrinsic motivation among individuals (Hackman & Oldham, 1980). Since work environments that stimulate individual's intrinsic motivation have been found to be related to increased level of creative output (Shalley et al., 2004; Zhou & Shalley, 2003), the link between motivational job characteristics and creativity became established.

The first attempts of scientific engagement in work design as we know it today can be traced back to Frederick Taylor and his experiments and principles of "scientific management" as well as the subsequent human relations movement, where the underlying assumptions in both cases was that performance could be improved by modifications of the job task itself as well as the

environmental conditions surrounding the work place (Taylor, 1911; Mayo, 1933). However, the theoretical assumptions regarding contemporary work design theory is much based on the influential work by Herzberg and his two-factor theory of satisfaction and motivation (Herzberg, Mausner & Snyderman, 1959; Herzberg, 1966). This theory deals with the determinants of satisfaction and motivation in the workplace and states that in order for a job to enhance work motivation, the presence of "motivators" (recognition, achievement, responsibility, advancement, personal growth in competence), or factors that are intrinsic to the work itself, are necessary. In contrast, factors that are extrinsic to the work itself, such as company policies, supervisory practices, pay plans et c., are not expected to lead to an increase in employee motivation, and can in fact lead to job dissatisfaction. Despite the theory's influence, empirical support is yet sparse, partly due to the theory's inability to acknowledge that individuals' responses to enriched, complex jobs might differ (Hackman & Oldham, 1976).

Another theoretical approach of relevance to theories of work design is activation theory which has been used to understand the work behavior of individuals in organizations, since it deals with the consequences and antecedents of heightened and depressed levels of psychological and physiological activation in organisms (Berlyne, 1967; Scott, 1966). The results of most studies shows that activation theory is valid in understanding repetitive and underactivating work, whereas less attention has been given to jobs that might be overstimulating or how individuals adapt to changing levels in stimulation (Hackman & Oldham, 1976).

The socio-technical systems theory acknowledges the interplay between social and technical aspects of the workplace, especially in relation to planned changes of the work system. This approach is based on the assumption that individuals have an intrinsic need for task accomplishment and are motivated by efficient work organization and by working on a whole or

complete task. However, the socio-technical systems theory is not particularly explicit and the adequacy of the theory has been discussed although it still remains a useful way of thinking when approaching work systems and work system redesign (Hackman & Oldham, 1980).

Lastly, the integrative approach is based on the work of Turner and Lawrence and focuses on the objective characteristics of work with an emphasis on developing measures of certain "Requisite Task Attributes" to test relationships between the nature of jobs and employee reactions to them. Subsequent studies found empirical evidence for the suggested relationships between work characteristics and how they affect employee attitudes and behavior (Turner & Lawrence, 1965; Hackman & Oldham, 1976).

Building largely on this theoretical foundation, in the 1970's, Hackman and Oldham first presented their original model of job design with the aim of improving work output by making work tasks more interesting, challenging, and intrinsically motivating (Hackman & Oldham, 1976). The work and application of the theoretical model used by Hackman and Oldham has since been used at different organizational levels and types of work (Elsbach & Hargadon, 2006). In essence, the Job Characteristics Model proposes that particular job characteristics have a direct impact on job outcomes. The model states that there are five core job characteristics (skill variety, task identity, task significance, autonomy, feedback) which impact three critical psychological states (experienced meaningfulness, experienced responsibility for outcomes, and knowledge of the actual results), in turn influencing work outcomes. Moreover, each step in this process is moderated by employee growth need strength (Hackman & Oldham, 1980).

Even though the importance of job characteristics has been questioned, where one common criticism towards related theories is that they tend to downplay the importance of the

social environment and the broader work context (Roberts & Glick, 1981), the general conclusion has nevertheless been that work characteristics has the potential to encourage higher levels of motivation and creativity. Motivation then influences where attentional effort is allocated, the proportion of total attentional effort towards the task, and for how long it is maintained over time (Campbell & Pritchard, 1976). Furthermore, individuals engaging in work that has been designed to be challenging, with higher level of responsibility and personal growth potential are more likely to exhibit higher levels of excitement and interest about their work activities, so the job design itself can actually foster creative achievements by employees. Moreover, since enriched jobs often requires a simultaneous focus on multiple dimensions of work, engaging in creative behavior can even be a requirement (Oldham & Cummings, 1996).

A number of specific work-related outcomes have been reported in support for these arguments. For example, a meta-analysis of the Job Characteristic Model reported links between an overall index of the job characteristics in the model and internal motivation, job satisfaction, and overall performance (Fried & Ferris, 1987). Moreover, positive and significant relations between supervisory ratings of creativity and objective measures of employees' job complexity as well as between employee self-reports of job complexity and the number of creative ideas they submitted to an organization suggestion program has been reported (Roos & Treiman, 1980; Hatcher, Ross & Collins, 1989), and in general the design of jobs is considered to be an important contributor to employee creativity (West & Farr, 1990).

Although the most common job design measure is still the Job Diagnostic Survey (JDS) developed by Hackman & Oldham, one criticism is that the JDS is relatively narrow in its focus on motivational job characteristics coupled with low internal consistency in the JDS scales (Morgeson & Humphrey, 2006). Other alternative measures of work characteristics include the Multimethod

Job Design Questionnaire (MJDQ) and the Work Design Questionnaire (WDQ) (Campion, 1988; Morgeson & Humphrey, 2006), where especially the latter one holds promise with its comprehensive approach. This measure was developed from a review of the work design literature and distinguishes between work characteristics that can be sorted in three distinct categories: motivational, social, and contextual. The first category is the most studied in earlier research since it covers the overall complexity of work and follows the intrinsic motivation approach. An important distinction is the separation of motivational work characteristics into task characteristics and knowledge characteristics (Morgeson & Humphrey, 2006).

#### Task characteristics

- I. **Autonomy:** Reflects the extent to which a job allows freedom, independence, and discretion to schedule work, make decisions, and choose the methods used to perform tasks.
- II. **Task variety:** Refers to the degree to which a job requires employees to perform a wide range of tasks on the job.
- III. **Task significance:** Reflects the degree to which a job influences the lives or work of others, whether inside or outside the organization.
- IV. **Task identity:** Reflects the degree to which a job involves whole piece of work, the results of which can be easily identified.
- V. **Feedback from job:** Reflects the degree to which the job provides direct and clear information about the effectiveness of task performance.

#### Knowledge characteristics

- I. **Job complexity:** Refers to which extent the tasks on a job are complex and difficult to perform.
- II. **Information processing:** Reflects the degree to which a job requires attending to and processing data or other information.
- III. **Problem solving:** Reflects the degree to which a job requires unique ideas or solutions and reflects the more active cognitive processing requirements of a job.
- IV. **Skill variety:** Reflects the extent to which a job requires an individual to use a variety of different skills to complete the work.
- V. **Specialization:** Reflects the extent to which a job involves performing specialized tasks or possessing specialized knowledge and skill.



Jobs that exhibit high levels of the characteristics have the potential to significantly affect an employee's attitudes and behaviors. Thus, motivational work characteristics are assumed to fulfill the need for growth and development ubiquitous in most individuals (Morgeson & Humphrey, 2006).

## **2. Creativity**

The merits of creativity have since long been established both among researchers and practitioners. Through employee creativity, where employees produce novel, potentially useful ideas about organizational products, practices, services or procedures that later on are applied, the likelihood for organizational innovation, effectiveness and survival substantially increases when organizations are given more room to maneuver and adjust depending on shifting market conditions (Shalley et al., 2004). With this definition, both novelty and usefulness are important aspects of creativity, and in fact, only one of them is not enough. For example, an idea that is new but not useful, thus not having at least the potential to create value cannot be considered creative (George, 2007). Given the potential benefits of creativity, it has been frequently studied by scholars and a number of empirical studies have been carried out (Zhou & Shalley, 2003; Amabile et al., 2004).

Creative work is not related to any specific occupation or industry but occurs on any job that involves certain types of tasks and is not related only to idea generation but also idea implementation (Mumford et al., 2002). Early work on creativity was primarily centered on the individual itself, focusing on the personality traits, backgrounds, and work styles of individuals and how this was related to creativity. As a consequence, early work on creativity largely ignored the potential effect of the surrounding social environment (Amabile, 1997). It was not until increased scholarly interest in person-environment fit and the use of integrationist models that emphasized the

interplay between personal and contextual characteristics and their relationship with creativity, that characteristics of the work and work settings was determined a possibly important antecedent of creativity (Shalley et al., 2004).

Despite these research advancements regarding the antecedents and outcomes of creativity, one of the most fundamental assumptions of creativity remains largely unquestioned, namely that one of creativity as an unitary construct. Given the common definition of creativity as the production of novel and useful ideas, none or less consideration is given to the type of idea, the reasons behind its production, or the starting point of the creativity process. As such, the fundamental questions of why people engage in creativity and what is the initial state of the trigger are of importance. This is the approach Unsworth uses in her study where she presents a typology that seeks to explain an individual's engagement in creativity based on the dimensions of "why" and "what" (Unsworth, 2001). As such, the decision to engage in a creative process is a behavior initiated either through self-determined choice or because of external demands (Deci & Ryan, 1987).

Thus, creative behavior is either internally or externally driven or, in other words, engaged in either because an individual wants to or has to. Similarly, the degree of problem finding needed is also of potential importance, where the primary distinction is between open and closed problems, which refer to the extent a problem has been formulated before the creator begins the process (Unsworth, 2001; Getzels & Csikszentmihalyi, 1967). Based on these two dimensions, Unsworth suggests a matrix of different types of creativity: responsive, expected, contributory, and proactive, where different types of creativity might be more or less creative, depending on how great the external constraint is and how closed the problem is (Unsworth, 2001; Amabile, 1996). Out of these four types of creativity, proactive and responsive creativity are oppositional based on the dimensions used in the matrix which makes them suitable for further investigation. This approach

furthermore conceptualize creativity as a process of behaviors designed to generate new ideas, products etc. rather than a strict focus on outcomes, and is also focused on the deliberate undertaking of behaviors expected to generate creative outcomes (Unsworth & Clegg, 2010).

Responsive creativity is the most frequently studied form of creativity in previous laboratory setting-based research and has usually been experimental where the participant is presented with a problem coupled with externally placed demands, or in the form of special occupations with external demands of creativity placed on them. Responsive creativity can therefore be described as a situation in which the participant responds to the requirements of the situation and to the presented problem. This is substantially different from proactive creativity, which is similar to that of a proactive personality (Bateman & Crant, 1993), and occurs when individuals actively search for problems to solve, primarily driven by internal motivation in the absence of external demands with voluntarism being an important component. Empirical studies on proactive creativity are relatively sparse but participation in suggestion schemes have been studied in two separate studies (Frese et al., 1999; Oldham & Cummings, 1996).

To summarize earlier research, most results indicate that work complexity is positively related to creativity, often explained through a mediated stage of increased intrinsic motivation. However, by using the distinction of drivers and problem types and considering the categorization of different forms of creativity, the antecedents of creativity as well as the specific nature of the creativity appears most likely to differ. Considering this, it seems implausible to convincingly claim a conclusive one-route relationship between work complexity and different types of creativity. Instead it is important to recognize that work complexity, understood through the overall framework of motivational work characteristics, has the potential to directly stimulate distinctly different kinds

of creativity, for example through the implicit demand for creative action entailing works that have a high level of required problem solving.

### **3. Self-Determination Theory**

Self-determination theory explains and highlights peoples' inner resources for personality development and behavioral self-regulation. As such, an important component of self-determination theory is the importance of peoples' inherent growth tendencies and innate psychological needs, which specifically are competence, relatedness, and autonomy (Deci & Ryan, 2000). Another important component of self-determination theory is its focus on how individuals make choices, and to the degree to which an individual's behavior is self-motivated and self-determined, and makes the important distinction between authentic and externally controlled motivation, where people exhibiting the former one displays more interest, confidence, and excitement compared to the latter one, naturally also affecting a number of work-related outcomes (Deci & Ryan, 2002). Cognitive evaluation theory, a sub-theory of self-determination theory, seeks to explain which factors that determine variability in intrinsic motivation, the inherent tendency to seek out novelty and challenges, to explore and to learn, and states that intrinsic motivation is dependent on social environmental factors such as challenges and experienced competence can stimulate intrinsic motivation (Deci & Ryan, 2000), factors that can be linked with work complexity.

Research on the relationship between work complexity and creativity has often followed the intrinsic motivation-approach, where a consequential argument has been that extrinsic motivation is detrimental to creativity (Amabile, 1985). The term extrinsic motivation refers to the performance of an activity in order to attain some separable outcome. As such, extrinsic motivation is more driven by instrumentality, and self-determination theory describes different kinds of

extrinsic motivation where the one most commonly contrasted with intrinsic motivation is externally regulated behaviors, or behaviors that are performed to satisfy an external demand or reward contingency. Thus, the main reason to engage in these activities is because the behaviors are prompted, modeled, or valued by significant others (Deci & Ryan, 2000), and are hardly linked with elements of voluntarism and proactivity.

However, given the new conceptualization and distinction between different types of creativity, the driver for engagement in responsive creativity is in fact stemmed from an external source. A theory often used in support for this view is the learned industriousness theory, which describes how monetary or other extrinsic means may encourage motivation, where individuals learn which performance dimensions that lead to reward and becomes motivated to perform them accordingly (Hammond et al., 2011; Eisenberg, 1992). A reconsideration of the effect of extrinsic motivation in relation to creativity is therefore justified, recognizing that there might be real sources of extrinsic motivation for creativity in organizations where employees experience external pressure to solve problems and take advantage of opportunities (George, 2007).

#### **4. Activation Theory**

Activation theory explains how individuals through mental arousal or activation become motivated to function effectively and is useful in understanding how employees respond to work complexity. More specifically, activation theory posits that behavior is influenced to a large extent by changes in perceived activation levels. Activation refers to the stimulation that impacts a person at a given situation and can be anything from external, internal, and cerebral sources (Gardner, 1990).

People will seek activation through different types of stimulation related to work-tasks such as novelty, complexity, and variation. Intermediate levels of activation are considered optimal, but when individuals are experiencing either low or high activation levels, the resulting outcome is primarily negative in terms of task performance, affective response etc (Scott, 1966). Likewise, the Yerkes-Dodson law postulates that human performance at any task varies with arousal in a predictable way where an increasing level of arousal is typically associated with increased performance, but only up to a point in which after increasing arousal instead leads to a decline in performance, where individuals instead engages in satisficing. At this stage, individuals seek any way of decreasing their arousal level to a manageable level leading to the use of suboptimal solutions (Yerkes & Dodson, 1908). This explain why some employees maintain and increase motivation and performance through work complexity, whereas others' performance is decreased due to overly high activation levels, resulting in relatively lower levels and different types of creative performance. Activation theory therefore predicts an inverted-u relationship between activation level and work-related performance measures, including creativity (Gardner, 1990). Therefore, it can be proposed that certain individuals will experience a high level of work complexity as optimal, enabling them to fully engage in the activities at work and explore new ideas and solutions, thereby displaying a more proactive approach in general (Baer & Oldham, 2006). Others will find that the high level of work complexity is not optimal in relation to their characteristic levels, restricting the proactive approach to creativity, instead causing them to engage in creativity-related satisficing.

By integrating these ideas and theoretical frameworks, the intrinsic motivation approach on the link between work complexity and creativity still holds value, but might be most relevant to proactive creativity which is internally driven and, holding other things equal, requires more cognitive effort from the individual. Responsive creativity, on the other hand, is in fact stemmed

from external sources, and is as such creativity at a lower level of engagement, recognizing the tradeoff between creative action and habitual action suggested by earlier research (Ford, 1996).

By recognizing both of these types of creativity, further insights might be gained in understanding the relationship between work complexity and creativity and why some individuals voluntarily comes up with new solutions and suggestions, whereas others simply responds to the requirement in terms of creative action in a kind of minimum level of creative engagement. By this approach, the acknowledgement that work complexity can stimulate two distinctly different types of creativity was explicitly stated, providing an expansion of earlier research.

*Hypothesis 1-A: Work complexity will be positively related with proactive creativity*

*Hypothesis 1-B: Work complexity will be positively related with responsive creativity*

## **5. Psychological Empowerment and Cognitive Overload**

Having recognized that work complexity might be related with distinctly different types of creativity, the next challenge is to try and understand what might predict these different types of creativity through a more fine-grained interpretation of the mediating psychological mechanism. One of the most central aspects of Hackman & Oldham's model is the personal and work outcomes in the model. These include low absenteeism and turnover, high quality work performance, high satisfaction with the work, and high internal work motivation. Out of these, high internal work motivation is the most critical aspect to the theory (Hackman & Oldham, 1976).

Intrinsic motivation refers to motivation that comes from inside an individual rather than from an external source. As such, it has been suggested that individuals exhibit more creative behavior if their motivation stems from personal interest, satisfaction or pleasure from working on a task. Indeed, the concept of internal motivation has been important in research on individual creativity since individuals displaying high levels of internal motivation are more likely to be persistent, productive, and creative in their efforts (Amabile, 1997; Shalley, 1991). In recent years, the classic theories of work design have been extended and developed, where both new mediators and outcomes have been considered in relation to job characteristics and the work context.

One of the results of the efforts to move beyond the scope of the proposed psychological states in Hackman & Oldham's model is an heightened interest in the concept of psychological empowerment which has been given increased recognition in organizational studies (Spreitzer, 1995; Thomas & Velthouse, 1990). Originally, empowerment primarily referred to specific practices concerned with delegating decision making and information and resource sharing between different organizational levels, but in recent years, increased attention has been given to psychological experience of empowerment (Spreitzer, 1995).

Empowerment has been defined both as the motivational concept of self-efficacy (Conger & Kanungo, 1988) and is a multi-faceted construct focusing on increased intrinsic task motivation manifested in four different cognitions: meaning, competence, self-determination, and impact, which together reflect an active orientation to a work role. Although these cognitions overlap with the psychological states in Hackman & Oldham's model, evidence for the mediating role of psychological empowerment is stronger (Spreitzer, 1995).



Given this, empowerment should not be understood as a stable dispositional trait but rather a set of cognitions that can be shaped by the work environment. Therefore, an individual's work context and personality characteristics have the potential to shape empowerment cognitions which in turn affect individual behavior (Thomas & Velthouse, 1990). The specific antecedents of psychological empowerment that have been suggested to influence an individual's sense of empowerment include both personality traits and work context and are: self-esteem, locus of control, information, and rewards (Lawler, 1986; Kanter, 1989; Thomas & Velthouse, 1990). Regarding the outcomes of psychological empowerment, effectiveness and innovative behavior has been specifically mentioned, as well as its relation with individuals who take initiative, embrace risk and cope with high uncertainty (Spreitzer, 1995). When considering the individual dimensions of psychological empowerment separately, they have been associated with a number of positive outcomes such as high commitment and energy (Kanter, 1983), effort and persistence in challenging situations (Gecas, 1989), coping and high goal expectations (Ozer & Bandura, 1990) e.g., resulting in higher effectiveness. Psychological empowerment has furthermore been positively associated with creativity, particularly since empowered individuals display high levels of autonomy and self-efficacy, and has been argued to be an important factor for stimulating change in organizations, (Amabile, 1988; Conger & Kanungo, 1988).

Despite an abundance of research in support of the positive relationship between the motivational potential inherent in the overall work complexity of an enriched job, a number of negative outcomes of having a complex and challenging job has also been reported. In fact, the contemporary professional work environment, characterized by increased workload pressure has been argued to cause jobs that are designed to be challenging and intrinsically motivating instead become stress inducing with a detrimental effect on creativity (Elsbach & Hargadon, 2006). Specifically, work contexts that involve chronically high workload pressures with cognitively

challenging tasks, time pressures, supervisor interference etc., have been reported to be harmful to professional creativity (Amabile et al., 1996). High levels of work complexity have also been shown to be related to increased stress (Xie & Johns, 1995), and complexity and subsequent cognitive demands may also drain an individual of cognitive resources, thereby decreasing creativity (Ohly et al., 2006).

Thus, depending on a number of contextual and individual factors, earlier research indicates that the work context can either stimulate or decrease individual creativity among employees given the common definition of creativity, and these results clearly illustrates the either-or approach regarding the relationship between the work complexity of enriched jobs and creativity that has been prevalent in this research field. One theoretical model that specifically acknowledges this complexity is Karasek's demand-control model of job stress, where two elements of work related stressors are introduced; namely high psychological workload demands pressures combined with low control or decision latitude in meeting those demands. This model provides a useful framework for understanding how a specific work related situations might lead to different paths for an individual employee, where in the presence of work related stressors, psychological strain and even physical illness might occur. On the contrary, in the absence of these work related stressors, an individual employee might engage in active learning, and even develop the motivation to develop new behavior patterns (Karasek & Theorell, 1990).

Using a partly overlapping argumentation and theoretical reasoning, the job demands resources model of burnout categorizes working conditions in two domains, job demands and job resources. These two categories are further related to different outcomes where job demands are specifically related to the exhaustion component of burnout whereas a lack of job resources is primarily related to disengagement. Job demands refers to the physical, social, or organizational

aspects of work that requires physical or mental effort with a potential risk of physiological or psychological costs such as exhaustion. Job resources on the other hand are the physical, psychological, social, or organizational aspects of work that may either be functional in achieving certain work-related goals, reduce job demands or stimulate personal growth and development. These resources can either be external resources (organizational and social) or internal resources (cognitive features and action patterns). Indeed, the results of this study gave support for the hypothesis that job demands and job resources led to different outcomes (Demerouti et al., 2001), perhaps suggesting that certain job characteristics has the potential to lead to different individual outcomes depending on certain contingencies, a conclusion that is worthy of further elaboration in creativity research.

As for potential negative consequences of work complexity, one related construct of importance is that of cognitive overload, which refers to an overload of individuals working memory, or the system that holds information on how to conduct tasks related to reasoning and comprehension, and is as such related to problem-solving skills, reasoning et c. (Paas et al., 2004). The theoretical rationale behind cognitive overload can be understood from the cognitive load theory, which in essence proposes that since working memory is limited, an overabundance of information and inability or difficulty to process it results in cognitive overload (Sweller, 1988). In relation to creativity, a decline in cognitive capacity has been related to a reduced ability to solve problems flexibly and creatively (Hallowell, 2005) and is more likely to cause individuals to engage in narrow and stereotypical thinking, thus reducing the capacity to think comprehensively about an issue. High levels of cognitive capacity, on the other hand, has been found to both improve problem solving of novel tasks and increase creative output (Gilbert & Hixon, 1991).

To understand how cognitive overload is related to performance, insights might be gained from the related construct of emotional exhaustion or burnout and its theoretical relation to the Conservation of Resources Model (COR). This model simply states that individuals experience stress as either a loss of resources, threat to current resources, or inadequate return on investments made to maximize resources, and emotional exhaustion and other related constructs represents a depletion of resources resulting in employees carefully considering how to use their remaining resources. In this stage, employees will carefully select which resources to engage in order to satisfy for example performance goals at work. Furthermore, this also implies that employees are more likely to invest these resources where the potential return on investment is the greatest (Halbesleben & Bowler, 2007; Hobfoll & Freedy, 1993). Previous studies have studied how individuals invest these resources in relation with extra role performance and organizational citizenship behavior (Halbesleben & Bowler, 2007), an argumentation that is valid to explain the engagement in certain types of creative behavior as well.

The dual nature of the consequences of work complexity is further exemplified by studies that have shown how predictors can create substantially different outcomes on different forms of creativity. In interviews with engineers it was found that time pressure had a negative effect on proactive creativity, whereas it has a positive effect on responsive creativity depending on the nature of the problem itself (Unsworth & Clegg, 2010). This example highlights the importance of distinguishing between different forms of creativity and their respective dimensions, while at the same time acknowledging that possible contingent factors in work-settings as well as individual differences can lead to different outcomes and psychological reactions that may mediate the relationship between work complexity and different types of creativity. Both Karasek's demand-control model of job stress and the job demands resources model of burnout provide useful frameworks in this scenario to illustrate the reasoning.

Thus, work complexity has the potential to stimulate favorable psychological responses through for example a learning process (Karasek & Theorell, 1990) or the intrinsic motivation approach where the outcome is a stage of psychological empowerment (Spreitzer, 1995). When considering how psychological empowerment is associated with individuals who take initiative, embrace risk, cope well with high uncertainty, and are more likely to engage in highly innovative behavior, it is not a far stretch to argue that psychological empowerment is positively related with proactive creativity.

However, work complexity may also cause employees to drain their cognitive resources, where for example high demands of job characteristics such as information processing instead causes difficulties in processing the information, resulting in cognitive overload. Earlier studies have mostly reported detrimental effects on cognitive overload and related constructs on creativity. Although higher cognitive efforts are needed to cope with the work complexity, this does not mean that all creative efforts are abandoned. As mentioned, the design of jobs and job characteristics has been found to be an important contributor to employee creativity, and since complex jobs by default often require the engagement in creative behavior (West & Farr, 1990; Oldham & Cummings, 1996), it does not appear plausible that cognitive overload completely mitigates the effect on creativity, but rather decreases problem solving skills and causes employees to engage in satisficing behavior and a minimum engagement level in creativity.

*Hypothesis 2-A-1: Work complexity will be positively related with psychological empowerment*

*Hypothesis 2-A-2: Work complexity will be positively related with cognitive overload*

*Hypothesis 2-B-1: Psychological empowerment will be positively related with proactive creativity*

*Hypothesis 2-B-2: Cognitive overload will be positively related with responsive creativity*

*Hypothesis 2-C-1: Psychological empowerment will mediate the relationship between work complexity and proactive creativity*

*Hypothesis 2-C-2: Cognitive overload will mediate the relationship between work complexity and responsive creativity*

## **6. The moderating role of Ambiguity Tolerance**

Since job resources, including internal resources (cognitive features and action patterns) has the potential to stimulate personal growth and development, thereby creating different outcomes (Demerouti et al., 2001), considering cognitive or personality related variables as contingent factors that possibly affects the strength or direction of the relationship between work complexity and the psychological reaction is justified. This is an approach favored in previous research, where the interplay between individual, motivational, group and organizational characteristics is hypothesized to produce creative output (e.g. Amabile, 1996; Woodman et al., 1993).

Indeed, constructs such as need for cognition, or an individual's tendency to engage in and enjoy thinking has been associated with individual innovation behavior (Wu et al., 2011). The level of need for cognition determines to what extent an individual prefer engaging in complex situations and also directly influences the amount of effort devoted to cognitive elaboration (Cacioppo et al., 1996). As such, the concept of need for cognition is dependent on the context and should primarily be understood using an interactionist approach and has through this been linked with job characteristics. Specifically, need for cognition has been found to be an important determinant of

individual innovation behavior when linked with certain job characteristics such as job autonomy and time pressure (Wu et al., 2011). Need for cognition is in many ways similar to the construct of ambiguity tolerance. Ambiguity tolerance has been long studied in psychology in various domains and refers to the way an individual perceives and processes information about ambiguous situations or stimuli when confronted by an array of unfamiliar, complex, or incongruent clues. Ambiguity tolerance is often conceived on a unidimensional scale, where an individual that displays a high level of ambiguity tolerance perceives the ambiguous situation as challenging or even desirable, whereas an individual with a low level of ambiguity tolerance responds to the situation with stress and avoids ambiguous situations. As such, ambiguity tolerance can be understood as either a personality trait or a cognitive and perceptual process (Furnham & Ribchester, 1995).

Since the 1950s, research on ambiguity tolerance and its relationship with different variables in a number of domains has been abundant, spanning from both societal level research on ethnocentrism (Block & Block, 1950) to individual level research on dissonance and task-related research (Shaffer et al., 1973). In the 1990s, in a study concerning the relationship between ambiguity tolerance, playfulness, and creativity, ambiguity tolerance was found to be correlated with both playfulness and creativity (Tegano, 1990). Subsequent research further supported the positive relationship between the level of ambiguity tolerance and how it affected a number of work related outcomes (Furnham & Ribchester, 1995).

Building on these earlier studies, it can be argued that individuals with a high level of ambiguity tolerance will have a more positive attitude towards novelty, complexity, and uncertainty, which will be associated with a higher probability to respond favorably to the ambiguous elements and situations that comes with having a challenging and complex job, resulting in a psychological state of empowerment characterized by increased intrinsic task motivation. On the contrary, an

individual with a low level of ambiguity tolerance, or in other words an individual that does not enjoy, or even responds negatively to ambiguous situations, will have to devote more cognitive resources to simply just cope with the challenges that work complexity entails, increasing the likelihood of experiencing a higher perceived workload.

*Hypothesis 3-A: Ambiguity tolerance will positively moderate the relationship between work complexity and psychological empowerment*

*Hypothesis 3-B: Ambiguity tolerance will negatively moderate the relationship between work complexity and cognitive overload*

## **7. The moderating role of Innovative Cognitive Style and Supervisor**

### **Support for Creativity**

Substantial research has been carried out that acknowledges the interaction between contextual and personal characteristics and how they interact and influence and explain creativity. Regarding the personal characteristics, personality as well as cognitive style is generally considered to be important determinants of creativity (Woodman, 1981; Oldham & Cummings, 1996; Zhou & Oldham, 2001).

Cognitive style is a term that has been defined as the stable attitudes, preferences, or habitual strategies that determine individuals' modes of perceiving, remembering, thinking, and problem solving (Messick, 1976). Cognitive style has been a topic of research in the field and subfields of psychology since the 1950s when the existence of individual differences in cognitive



tasks involving perception and categorization were revealed. Although the research field is somewhat saturated, cognitive style is still considered a fundamental factor determining both individual and organizational behavior (Kozhevnikov, 2007). Given the field's maturity, attempts to classify and categorize different cognitive styles have resulted in researchers describing 40 separate styles (Keefe, 1988).

One of the most influential models of cognitive style was devised by Kirton in his Adaption-Innovation theory, where individuals were categorized as either adaptors or innovators according to their preferred approach to problem solving (Kirton, 1976, 2003). This categorization constitutes an illustrative example of how cognitive style has been used in research in applied fields related to complex cognitive tasks, such as problem solving, decision making et c. According to Kirton, adaptors are individuals more inclined towards accepting recognized policies and proposes ways of "doing something better". Innovators, on the other hand, are individuals more prone to question the problem itself, taking it out of its context and propose new ways of "doing something differently". As such, this dimension has been found to be a stable dimension, indicating that it develops early in life and remain more or less stable over time and across situations (Kirton, 1989). Although some research has used cognitive style, as well as Kirton's distinction of adaptors and innovators, as indicators of creativity itself, following the approach of most studies (e.g. Scott & Bruce, 1994), this study conceptualized cognitive style as a preferred problem-solving style rather than an indicator of creativity.

In a study of determinants of individual innovative behavior, a distinction was made between intuitive versus systematic problem solvers and results showed that the former one inhibited more innovative behavior (Scott & Bruce, 1994). These two constructs share a lot of similarities with Kirton's categorization where a systematic problem-solving style is characterized

by adherence to habit, rules, routines, and rationality where the working methods and procedures are well established. Individuals more prone to this approach are likely to come up with conventional solutions to a problem. On the contrary, individuals with an intuitive problem-solving style is characterized by overlapping separate domains of thoughts simultaneously, driven on by intuition on imagination, with a higher probability to come up with novel solutions to problems (Jabri, 1991; Scott & Bruce, 1994). Given the documented effect of cognitive style on creativity, an innovative cognitive style was hypothesized to moderate the relationship between the psychological states and the multiple types of creative behavior.

Contextual characteristics, such as a work environment where creativity is supported and encouraged, are also important stimulants of creativity (e.g., Amabile et al., 1996; Redmond et al., 1993). Consistent with this, a number of studies have emphasized the importance of leadership in relation with creativity and innovation with a focus on role expectations, goals, leadership styles, and activities (Kanter, 1983; Amabile, 1988). Previous research has demonstrated that both leader-member exchange and relationship with supervisors has significant potential to either stimulate or diminish intrinsic motivation with different outcomes in terms of creativity (Shalley et al., 2004). Apart from leadership style, role expectations, goals, and encouragement are other ways for supervisors to influence the creative activity of employees. Goals and role expectations can both increase attention and effort, as well as regulate action by the way it determines what to focus on, and to what extent time and effort should be made. As such, goal setting is a powerful motivating technique for supervisors and organizations to use (Shalley & Gibson, 2004; Locke & Latham, 1990). Encouragement for creative performance through recognition, respect, support, feedback, and information are other ways through which creativity among employees can be stimulated (Madjar, Oldham & Pratt, 2002). This might be particularly relevant in complex jobs that are difficult and demanding, where supervisor encouragement might enable employees to combine

relevant knowledge and information (Kohn & Schooler, 1983) and to consider alternative ways to complete their work tasks (Shalley, 1995). Supervisor encouragement also has the potential to stimulate employees' self-determination, personal initiative, and interest, with overall positive effects on their creative performance.

Another way through which goal setting or expectations of creativity can stimulate creative effort among employees is through their informational aspect. When individuals know the value and importance of creativity, they are more likely to be creative (e.g., Carson & Carson, 1993; Shalley & Gibson, 2004). On the contrary, when specific organizational goals of creativity are absent, lower levels of creative activity have been reported (Amabile & Grysiewicz, 1989). Thus, through articulating organizational goals and values as well as encouraging employees, supervisors can affect the attention and effort of employees that are operating in a complex environment characterized by ambiguity and difficulty (e.g., Campbell, 1988), ultimately affecting employee's creative performance. Thus, leaders that want to extract more creative activity would benefit from setting creativity goals, either through a focus on individual output or encouraging employees to engage in activities that could lead to creativity. All in all, earlier studies and argumentation generally acknowledges the collaborative nature of creative work, arguing that creativity in an organizational setting is resource intensive, uncertain, and risky, indicating the importance of both organizational strategies generally as well as the importance of leadership specifically in relation to creativity (Mumford et al., 2002). Therefore, given the documented effect of supervisor support for creativity, it was hypothesized to moderate the relationship between the psychological reactions and the different types of creative behavior.

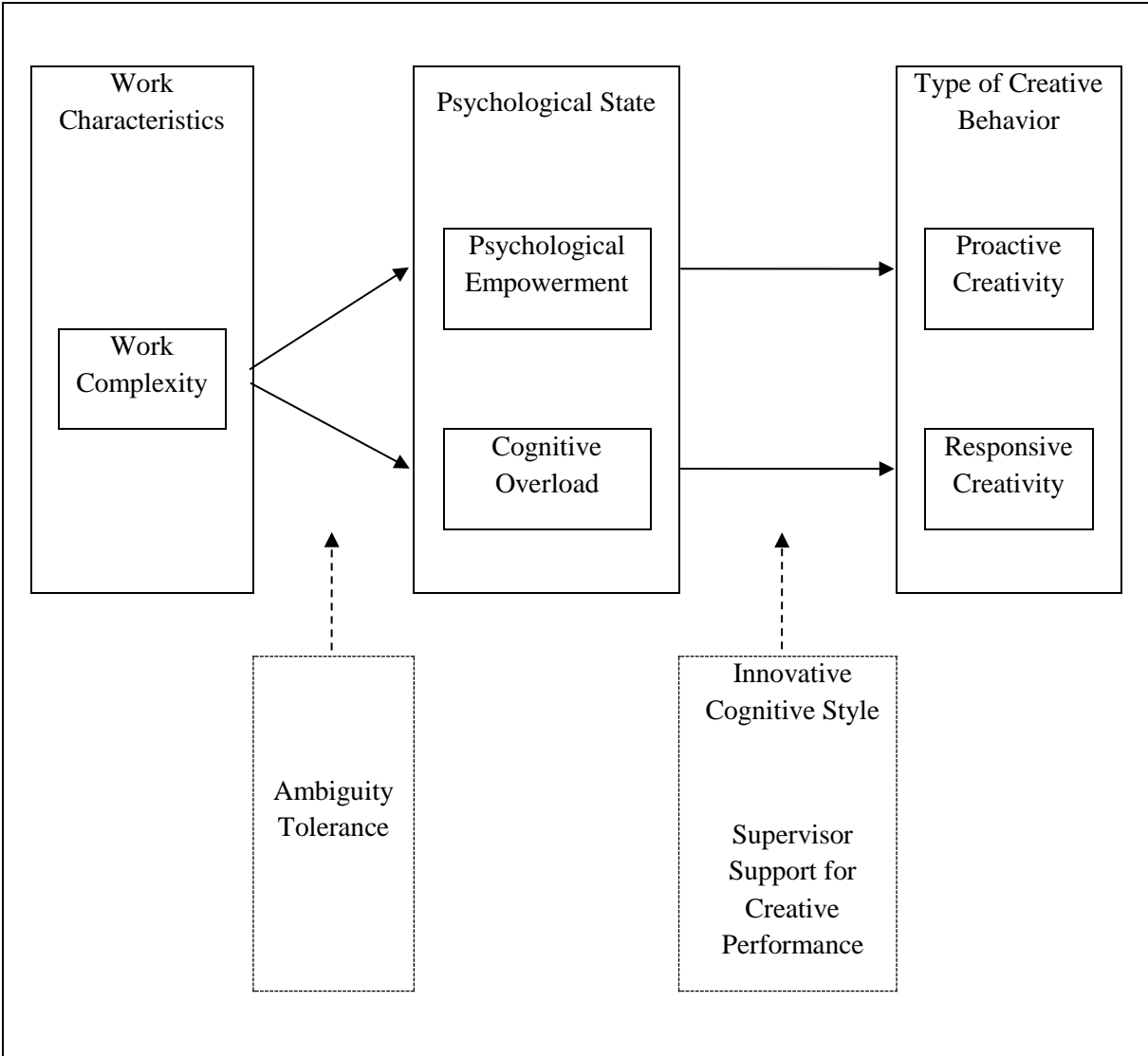
*Hypothesis 4-A-1: Innovative cognitive style will positively moderate the relationship between psychological empowerment and proactive creativity*

*Hypothesis 4-A-2: Innovative cognitive style will positively moderate the relationship between cognitive overload and responsive creativity*

*Hypothesis 4-B-1: Supervisor support for creative performance will positively moderate the relationship between psychological empowerment and proactive creativity*

*Hypothesis 4-B-2: Supervisor support for creative performance will positively moderate the relationship between cognitive overload and responsive creativity*

**Figure 1. Research Model**



## CHAPTER III: METHODS

### 1. Sample and Procedures

A sample of 143 independent dyads of focal employees and their supervisors was collected for this study. Data were collected in both South Korea and Sweden from a diverse range of organizations and industries including general management, manufacturing, R&D, and sales.

To reduce common method bias by separating responses for the different variables (Doty & Glick, 1998), two survey instruments were used in this study. Employees first answered and provided information and self-report on demographics, work complexity, ambiguity tolerance level, psychological empowerment, cognitive overload, innovative cognitive style, and supervisor support for creative performance. In the next stage, supervisors provided information on demographics and evaluated the employees' creative performance. For the Korean sample, after initial approval from the organization or supervisor, survey package envelopes were distributed to employees who were first asked to finish the employee survey, seal it, and then pass along the survey package to their respective supervisor. Supervisors then finished the supervisor survey. For the Swedish sample, the surveys were conducted online, following a similar procedure. All the participants were assured that their responses would be treated confidentially.

The employees in the final sample were 53.8% male and 46.2% female. Average age was 34 years with the youngest being 22 years and the oldest 64 years old. The average organizational tenure was 6.5 years with values ranging from 3 months to 47 years and two months. The average tenure in the current team was 3 years with values ranging from 2 months to 32 years and two

months. Regarding employees' highest education level, 11.9% had completed high school, 10.5% had completed college (vocational school, trade school et c.), 56.5% had completed university, and 21.0% had completed graduate school.

For the supervisor sample, 71.3% were male and 28.7% were female. Average age was 40.7 years with the youngest being 24 years and the oldest 63 years old. The average organizational tenure was 9.1 years with values ranging from 4 months to 40 years. The average tenure in the current team was 3.8 years with values ranging from 2 months to 33 years. Regarding supervisors' highest education level, 7.7% had completed high school, 10.5% had completed college (vocational school, trade school et c.), 52.4% had completed university, and 29.4% had completed graduate school. The average team size (including supervisors) was 11.9 people with values ranging from 1 to 60.

**Table 1. Summary of sample**

		Employee		Supervisor	
	Variables	Frequency	Percent	Frequency	Percent
Gender	Male	77	53.8	102	71.3
	Female	66	46.2	41	28.7
	Total	143	100.0	143	100.0
Country	South Korea	56	39.2	56	39.2
	Sweden	87	60.8	87	60.8
	Total	143	100.0	143	100.0
Education Level	High School	17	11.9	11	7.7
	College	15	10.5	15	10.5
	University	81	56.5	75	52.4
	Graduate School	30	21.0	42	29.4
	Total	143	100.0	143	100.0
Assigned Job	General Management	52	36.4	48	33.6
	Sales	17	11.9	17	11.9
	R & D	30	21.0	34	23.8
	Manufacturing	24	16.8	24	16.8
	Other	20	14.0	20	14.0
	Total	143	100.0	143	100.0
Employment Type	Regular	116	81.1	141	98.6
	Contract	15	10.5	2	1.4
	Contingent	12	8.4	-	-
	Total	143	100.0	143	100.0
		Employee		Supervisor	
Age (years)	Total	143		137	
	Mean	34.0		40.7	
	Standard Deviation	10.3		9.1	
Team Tenure (years)	Total	143		142	
	Mean	3.0		3.8	
	Standard Deviation	3.8		4.4	
Organization Tenure (years)	Total	143		142	
	Mean	6.5		9.1	
	Standard Deviation	9.3		7.6	
Team Size	Total	-		140	
	Mean	-		11.9	
	Standard Deviation	-		8.0	



## 2. Measures

The independent, mediating, and moderating variables in this study were measured using employee self-reports. The dependent variables were rated by the employee's supervisor. Responses for all items were given on a six point scale where the respondents were asked to what extent they agreed to a number of statements with possible responses ranging from "disagree completely" to "agree completely". The demographic data covered gender, education level, age, job title, line of business, employment type, tenure within both the organization and the group, and number of team members.

**Work Complexity:** Work complexity has commonly been measured using items from the Job Diagnostic Survey (JDS) developed by Hackman & Oldham. However, given criticism on this approach's narrow focus (Morgeson & Humphrey, 2006), this study instead used a number of items concerning the motivational work characteristics (knowledge characteristics) from the Work Design Questionnaire (WDQ) (Morgeson & Humphrey, 2006). Specifically, job complexity, information processing, and problem solving were used to measure a job's work complexity. Worth noting is that job complexity is specifically task related and conceptually different from the overall measurement of motivational work characteristics which covers the overall complexity of work. Example questions: "The job requires me to analyze a lot of information" and "The job requires unique ideas or solutions to problems" ( $\alpha=0.907$ ).

**Ambiguity Tolerance:** Several different scales measuring ambiguity tolerance have been used in earlier research. This study used an extract of items from Norton's scale (1975), which compared to other scales have the best internal reliability (Furnham & Ribchester, 1995). Example questions: "In

a decision-making situation in which there is not enough information to process the problem, I feel very uncomfortable" and "It bothers me when I don't know how strangers react to me" ( $\alpha=0.799$ ).

**Psychological Empowerment:** The scale used to measure empowerment measures each of the four dimensions of empowerment (meaning, competence, self-determination, impact) (Spreitzer, 1995). Example questions: "The work I do is meaningful to me" and "I am confident about my ability to do my job" ( $\alpha=0.886$ ).

**Cognitive Overload:** The scale used to measure the level of cognitive load included a number of items from the NASA-TLX (Task Load Index) which measures perceived workload on different subscales: mental demand, physical demand, temporal demand, performance, effort, and frustration (Hart & Staveland, 1988). Example questions: "The pace of my job is hurried and rushed" and "My job is mentally demanding" ( $\alpha=0.869$ ).

**Innovative Cognitive Style:** Innovative cognitive style was measured through a number of items from Kirton Adaption-innovation Inventory (KAI) that has been used to distinguish between different forms of cognitive styles (Kirton, 1976). Example questions: "I would sooner create than improve" and "I need the stimulation of frequent change" ( $\alpha=0.661$ ).

**Supervisor Support for Creative Performance:** To measure supervisor support for creative performance, a number of items from earlier research (Madjar et al., 2002) were used. Example questions: "My supervisor encourages me to solve problems creatively" and "My supervisor gives me useful feedback about my ideas concerning the workplace" ( $\alpha=0.855$ ).

Proactive Creativity: To measure proactive creativity, a number of items aimed at specifically capturing the proactive and voluntary effort were constructed. Example questions: "Makes a lot of voluntary creative contributions in his or her work" and "Suggests useful ideas and solutions even without a specific problem to solve" ( $\alpha=0.917$ ).

Responsive Creativity: To measure responsive creativity, a number of items aimed at specifically capturing a more passive form of creative behavior where the employee merely responds to the requirements of creative effort were constructed. Example questions: "Needs a specific problem to solve in order to suggest new ideas and solutions" and "Is not likely to come up with creative solutions unless told to do so" ( $\alpha=0.863$ ).

Control variables: A number of control variables were included in this study. Gender (0=male, 1=female), education (1=less than high school, 2=high school, 3=college, 4=university, 5=graduate school), age (in years), team tenure (in years), and country (0=Korea, 1=Sweden) were considered in the analyses, in line with previous research on creativity (e.g. Scott & Bruce, 1994).

### **3. Analytical strategy**

Hierarchical regression analysis was conducted to examine the research model of this study. Using dyadic data from subordinates and supervisors, the effect of work complexity on employee's proactive creativity, responsive creativity, psychological empowerment, and cognitive overload was investigated. The analysis used mean-centered variables for the variables in the research model except for the outcome variables. To test the mediating effect of psychological empowerment and cognitive overload, Baron and Kenny's approach was adopted (Baron & Kenny, 1986) where mediation is examined through a series of models that assess the presence of mediation.

In the first step, control variables were entered, followed by a regression of the mediator on the independent variable. In the second step, the dependent variable was regressed on the independent variable. In the third step, the dependent variable was regressed on the mediating variable. The fourth and final step is conducted to establish complete or partial mediation, by examining whether the mediator makes a significant contribution to the outcome.

Finally, to test the moderating effect of ambiguity tolerance, innovative cognitive style, and supervisor support for creative performance, Aiken and West's procedure was followed to examine interacting and moderating effects (Aiken & West, 1991). The relationships between variables were then plotted graphically to examine the effects at different levels of the moderating variables.

## CHAPTER IV: RESULTS

### 1. Descriptive statistics

Table 2 shows the means, standard deviations, and correlations of the variables used in the study. Results showed that work complexity was positively correlated with the mediating variable psychological empowerment but showed no significant correlation with cognitive overload. Work complexity was also positively correlated to one of the outcome variables, proactive creativity, but not to responsive creativity. Regarding the moderators, ambiguity tolerance was positively correlated with psychological empowerment and negatively correlated with cognitive overload. Finally, innovative cognitive style was positively correlated with proactive creativity, but not with responsive creativity. Supervisor support for creative performance showed no sign of correlation with any of the outcome variables.

**Table 2. Means, standard deviations, and inter-scale correlations**

	Mean	S.D.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Gender	0.46	0.50	1												
2. Education	3.87	0.88	.08	1											
3. Age (years)	33.97	10.30	.13	-.01	1										
4. Team Tenure (years)	2.98	3.83	.12	-.04	.57**	1									
5. Country	0.61	0.49	-.03	-.12	.43**	.32**	1								
6. Work Complexity	4.24	0.90	-.01	.17*	.40**	.17*	.20*	1							
7. Psychological Empowerment	3.99	0.74	.10	.11	.05	.06	.09	.35**	1						
8. Cognitive Overload	3.69	1.12	.04	-.11	-.19*	-.06	-.49**	.11	-.18*	1					
9. Ambiguity Tolerance	3.24	1.03	-.14	.15	.06	.04	.21*	.15	.24**	-.52**	1				
10. Innovative Cognitive Style	4.05	0.70	-.08	.17*	-.03	.09	-.04	.21*	.18*	-.03	.02	1			
11. Supervisor Support for Creative Performance	4.25	0.90	-.13	.25**	-.00	-.07	.29**	.10	.20*	-.18*	.14	.12	1		
12. Proactive Creativity	3.98	1.03	-.02	.36**	.27**	.21*	.08	.42**	.30**	-.17*	.25**	.32**	.06	1	
13. Responsive Creativity	3.41	0.91	-.13	-.05	-.39**	-.30**	-.31**	-.11	-.32**	.35**	-.30**	.06	-.05	-.29**	1

N=143, \*\*\*<.001, \*\*<.01, \*<.05. 2-tailed.

## 2. Hypotheses testing

Hypotheses 1-A and 1-B proposed that work complexity is positively related to different types of creativity, specifically proactive creativity and responsive creativity. Results from model 4 in table 3 showed that work complexity had a positive and significant effect on proactive creativity ( $\beta=0.36$ ,  $p<.001$ ). Education level was also positively associated with proactive creativity ( $\beta=0.37$ ,  $p<.001$ ). However, results from model 4 in table 4 showed that work complexity did not have any significant relationship with responsive creativity. Thus, hypothesis 1-A was supported but hypothesis 1-B was not supported. However, an interesting finding from model 3 in table 4 is that the country variable was significantly related to responsive creativity, where Swedish respondents were more prone to engage in this type of creativity ( $\beta=-0.34$ ,  $p<.05$ ).

Hypothesis 2-A-1 and hypothesis 2-A-2 proposed that work complexity is positively related to psychological empowerment and cognitive overload respectively. Results from model 2 in table 3 showed that psychological empowerment was positively related to work complexity ( $\beta=0.31$ ,  $p<.001$ ) and results from model 2 in table 4 showed that cognitive overload was positively related to work complexity ( $\beta=0.37$ ,  $p<.001$ ), giving support for both hypothesis 2-A-1 and hypothesis 2-A-2. Again, the country variable had a significant relationship, this time with cognitive overload, where Swedish respondents reported higher levels of cognitive overload ( $\beta=-1.20$ ,  $p<.001$ ).

Hypothesis 2-B-1 proposed that psychological empowerment is positively related to proactive creativity and hypothesis 2-B-2 proposed that cognitive overload is positively related to responsive creativity. Results from model 7 in table 3 showed that proactive creativity was positively related to psychological empowerment ( $\beta=0.37$ ,  $p<.001$ ) and results from model 7 in

table 4 showed that cognitive overload was positively related to work complexity ( $\beta=0.23$ ,  $p<.01$ ), giving support for both hypothesis 2-B-1 and hypothesis 2-B-2.

Hypothesis 2-C-1 proposed that psychological empowerment mediates the relationship between work complexity and proactive creativity and hypothesis 2-C-2 proposed that cognitive overload mediates the relationship between work complexity and responsive creativity. In order to test these mediating hypotheses, the analytical procedure followed the steps suggested by Baron & Kenny (1986). As previously reported, results from model 2 in table 3 showed that, in the first step, psychological empowerment was positively related to work complexity ( $\beta=0.31$ ,  $p<.001$ ), meeting the first requirement of mediation. In the second step, the main effect between work complexity and proactive creativity was found ( $\beta=0.36$ ,  $p<.001$ ), satisfying the second requirement of mediation. The third step examined the relationship between psychological empowerment and proactive creativity and the findings satisfied the third requirement of the mediation test ( $\beta=0.37$ ,  $p<.001$ ). Finally, it was examined whether the mediator makes a significant contribution to the outcome by examining whether the contribution of the independent variable to the outcome variable becomes insignificant. As can be seen in model 5, this was not the case, indicating a partial mediation in support of hypothesis 2-C-1.

When examining the main effect between the independent variable and the outcome variables, the results have already shown that no significant relationship between work complexity and responsive creativity was found. Since there was no relationship between the independent and dependent variable, a mediating test following the Baron & Kenny-approach could not be conducted, thus giving non-support to hypothesis 2-C-2. However, since results showed that work complexity was positively related to cognitive overload ( $\beta=0.37$ ,  $p<.001$ ) and that cognitive overload was positively related to responsive creativity ( $\beta=0.23$ ,  $p<.01$ ) there were nevertheless



indications of an indirect effect that would explain the relationship between variables, and after conducting a Sobel test, the results indeed showed support for a significant indirect effect ( $z=2.43$ ,  $p<.05$ ).

**Table 3. Hierarchical regression examining the mediating effect of Psychological Empowerment in the relationship between Work Complexity and Proactive Creativity**

Variables	<u>Psychological Empowerment</u>				<u>Proactive Creativity</u>		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Step 1: Control variables							
Gender	0.15	0.19	-0.18	-0.14	-0.19	-0.18	-0.24
Education	0.10	0.04	0.43***	0.37***	0.36***	0.43***	0.40***
Age	-0.00	-0.01	0.02*	0.01	0.01	0.02*	0.02*
Tenure	0.01	0.01	0.03	0.04	0.03	0.03	0.03
Country	0.17	0.14	-0.02	-0.05	-0.09	-0.02	-0.08
Step 2: Independent variable							
Work Complexity		0.31***		0.36***	0.27**		
Step 3: Mediating variable							
Psychological Empowerment					0.27*		0.37***
R <sup>2</sup>	0.03	0.15	0.22	0.29	0.32	0.22	0.28
R <sup>2</sup> change		0.11***		0.08***	0.03*		0.07***

N=143, \*\*\*<.001, \*\*<.01, \*<.05.

**Table 4. Hierarchical regression examining the mediating effect of Cognitive Overload in the relationship between Work Complexity and Responsive Creativity**

Variables	<u>Cognitive Overload</u>		<u>Responsive Creativity</u>				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Step 1: Control variables							
Gender	0.05	0.10	-0.17	-0.16	-0.18	-0.18	-0.18
Education	-0.22*	-0.29**	-0.07	-0.09	-0.02	-0.07	-0.02
Age	-0.00	-0.02	-0.02*	-0.03*	-0.02*	-0.02*	-0.02*
Tenure	0.04	0.04	-0.02	-0.02	-0.03	-0.02	-0.03
Country	-1.20***	-1.24***	-0.34*	-0.35*	-0.06	-0.34*	-0.06
Step 2: Independent variable							
Work Complexity		0.37***		0.07	-0.01		
Step 3: Mediating variable							
Cognitive Overload					0.23**		0.23**
R <sup>2</sup>	0.28	0.35	0.20	0.20	0.26	0.20	0.26
R <sup>2</sup> change		0.07***		0.00	0.05**		0.06**

N=143, \*\*\*<.001, \*\*<.01, \*<.05.

Hypotheses 3-A and 3-B proposed that ambiguity tolerance positively moderates the relationship between work complexity and psychological empowerment and negatively moderates the relationship between work complexity and cognitive overload. To test these hypotheses, hierarchical regression analyses were conducted. As previously reported, results from model 3 in table 5 found that work complexity was positively related to psychological empowerment, as well as ambiguity tolerance. Results from model 4 in table 5 furthermore found that the interaction between ambiguity tolerance and work complexity was significantly related to psychological empowerment ( $\beta=0.21$ ,  $p<.01$ ) while the results also indicated that all incremental R-squared changes from one equation to the next were significant. A graphical interpretation of the interaction was also made (figure 4) which showed that when work complexity and ambiguity tolerance were both high, psychological empowerment was highest. On the contrary, when work complexity was high and ambiguity tolerance was low, psychological empowerment was lower. In summary, these results were in support of hypothesis 3-A.

Results from model 3 in table 6 found that work complexity was positively related to cognitive overload, and also that ambiguity tolerance was negatively related to cognitive overload. Results from model 4 in table 6 furthermore found that the interaction between ambiguity tolerance and work complexity was significantly related to cognitive overload ( $\beta=-0.24$ ,  $p<.01$ ) while the results also indicated that all incremental R-squared changes from one equation to the next were significant. A graphical interpretation of the interaction was also made (figure 5) which showed that when work complexity was high and ambiguity tolerance was low, cognitive overload was highest. On the contrary, when work complexity was high and ambiguity tolerance was high, cognitive overload was lower. In summary, these results were in support of hypothesis 3-B.

**Table 5. Hierarchical regression examining the moderating effect of Ambiguity Tolerance in the relationship between Work Complexity and Psychological Empowerment**

	<u>Psychological Empowerment</u>			
	Model 1	Model 2	Model 3	Model 4
Variables				
Step 1: Control variables				
Gender	0.15	0.19	0.23	0.25*
Education	0.10	0.04	0.01	-0.04
Age	-0.00	-0.01	-0.01	-0.01
Tenure	0.01	0.01	0.01	0.01
Country	0.17	0.14	0.07	0.03
Step 2: Independent variable				
Work Complexity		0.31***	0.29***	0.33***
Step 3: Moderating variable				
Ambiguity Tolerance			0.15*	0.11
Step 4: Moderating effect				
WC * Ambiguity Tolerance				0.21**
R <sup>2</sup>	0.03	0.15	0.19	0.25
R <sup>2</sup> change		0.11***	0.04*	0.06*

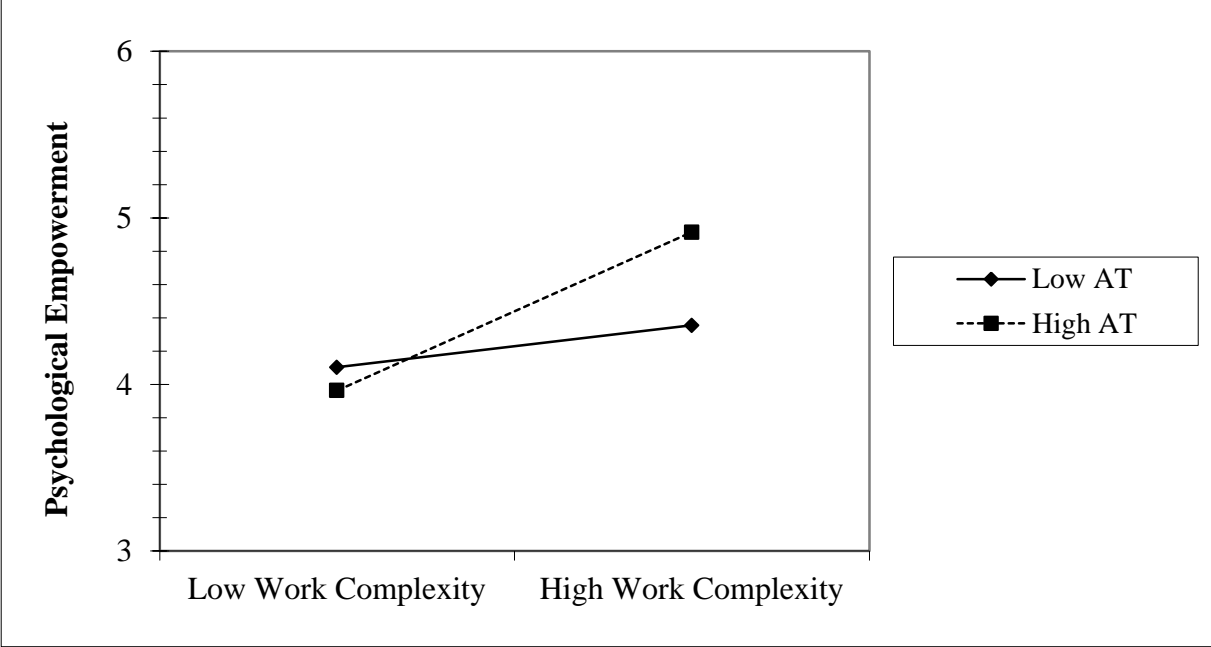
N=143, \*\*\*<.001, \*\*<.01, \*<.05.

**Table 6. Hierarchical regression examining the moderating effect of Ambiguity Tolerance in the relationship between Work Complexity and Cognitive Overload**

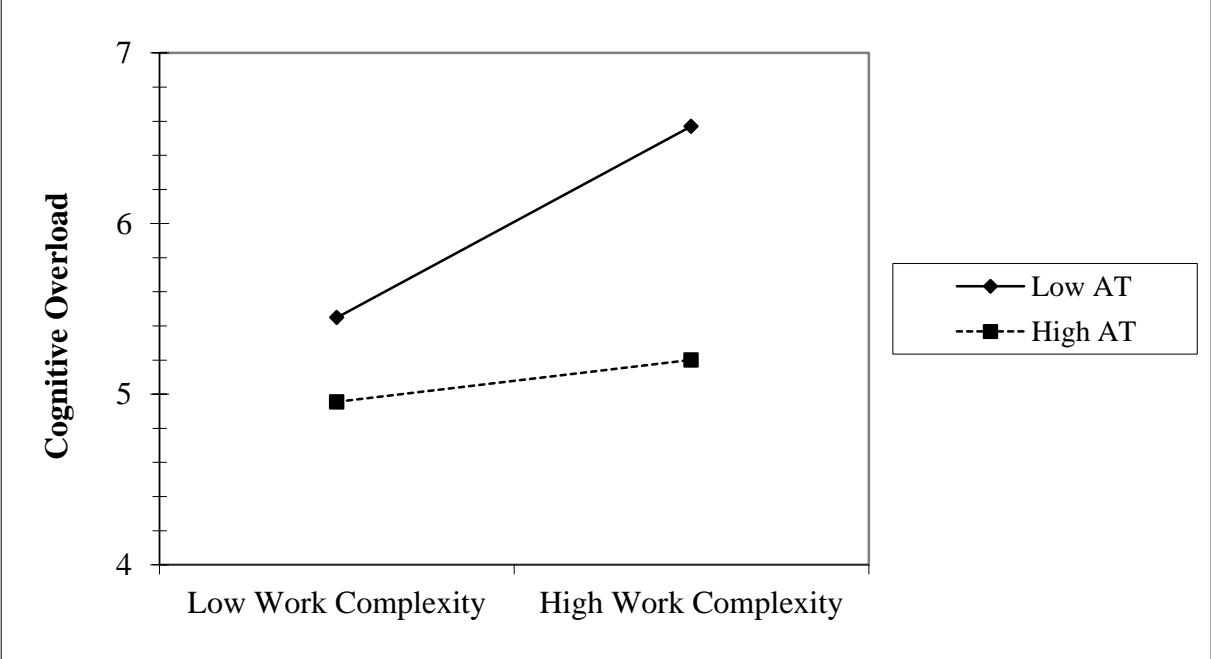
Variables	Cognitive Overload			
	Model 1	Model 2	Model 3	Model 4
Step 1: Control variables				
Gender	0.05	0.01	-0.04	-0.07
Education	-0.22*	-0.29**	-0.19*	-0.14
Age	-0.01	-0.02	-0.02*	-0.02**
Tenure	0.04	0.04	0.04*	0.05*
Country	-1.20***	-1.24***	-1.00***	-0.95***
Step 2: Independent variable				
Work Complexity		0.37***	0.42***	0.38***
Step 3: Moderating variable				
Ambiguity Tolerance			-0.44***	-0.45***
Step 4: Moderating effect				
WC * Ambiguity Tolerance				-0.24**
R <sup>2</sup>	0.28	0.35	0.53	0.56
R <sup>2</sup> change		0.07***	0.19***	0.03**

N=143, \*\*\*<.001, \*\*<.01, \*<.05.

**Figure 2. Interaction of Work Complexity and Ambiguity Tolerance on Psychological Empowerment**



**Figure 3. Interaction of Work Complexity and Ambiguity Tolerance on Cognitive Overload**



Hypotheses 4-A-1, 4-A-2 and 4-B-1, 4-B-2 proposed that innovative cognitive style and supervisor support for performance positively moderates the relationship between psychological empowerment, cognitive overload, and the outcome variables. To test these hypotheses, hierarchical regression analyses were conducted. Results from model 3 in table 7 found that innovative cognitive style, and in model 2 and 4, psychological empowerment was positively related to proactive creativity, but other than that, no significant interactions were found. Hypothesis 4-A-1 and 4-B-1 could not be supported. Results from model 3 in table 8 found that cognitive overload was positively related to responsive creativity, but other than that, no significant interactions were found. Hypothesis 4-A-2 and 4-B-2 could not be supported.



**Table 7. Hierarchical regression examining the moderating effect of Supervisor Support for Creative Performance and Innovative Cognitive Style in the relationship between Psychological Empowerment and Proactive Creativity**

	<u>Proactive Creativity</u>			
	Model 1	Model 2	Model 3	Model 4
Variables				
Step 1: Control variables				
Gender	-0.14	-0.19	-0.18	-0.19
Education	0.37***	0.36***	0.36***	0.37***
Age	0.01	0.01	0.02	0.02
Tenure	0.04	0.03	0.02	0.02
Country	-0.05	-0.09	0.02	0.02
Work Complexity	0.36***	0.27**	0.22*	0.23*
Step 2: Mediating variable				
Psychological Empowerment		0.27*	0.26	0.24*
Step 3: Moderating variables				
Supervisor Support for Creative Performance			-0.12	-0.10
Innovative Cognitive Style			0.30**	0.31**
Step 4: Moderating effect				
PE * Supervisor Support for Creative Performance				0.06
PE * Innovative Cognitive Style				-0.15
R <sup>2</sup>	0.29	0.32	0.37	0.37
R <sup>2</sup> change		0.03*	0.04*	0.01

N=143, \*\*\*<.001, \*\*<.01, \*<.05.

**Table 8. Hierarchical regression examining the moderating effect of Supervisor Support for Creative Performance and Innovative Cognitive Style in the relationship between Cognitive Overload and Responsive Creativity**

	<u>Responsive Creativity</u>			
	Model 1	Model 2	Model 3	Model 4
Variables				
Step 1: Control variables				
Gender	-0.16	-0.18	-0.17	-0.18
Education	-0.09	-0.02	-0.02	-0.02
Age	-0.03**	-0.02*	-0.02*	-0.02*
Tenure	-0.02	-0.03	-0.04	-0.03
Country	-0.35*	-0.06	-0.03	-0.05
Work Complexity	0.07	-0.01	-0.03	-0.02
Step 2: Mediating variable				
Cognitive Overload		0.23**	0.24**	0.23**
Step 3: Moderating variables				
Supervisor Support for Creative Performance			-0.01	-0.01
Innovative Cognitive Style			0.10	0.10
Step 4: Moderating effect				
CO * Supervisor Support for Creative Performance				0.05
CO * Innovative Cognitive Style				-0.01
R <sup>2</sup>	0.20	0.26	0.26	0.27
R <sup>2</sup> change		0.05**	0.01	0.00

N=143, \*\*\*<.001, \*\*<.01, \*<.05.

**Table 9. Summary of results**

	Hypotheses	Results
Hypothesis 1-A	Work complexity will be positively related with proactive creativity	Supported
Hypothesis 1-B	Work complexity will be positively related with responsive creativity	Not supported
Hypothesis 2-A-1	Work complexity will be positively related with psychological empowerment	Supported
Hypothesis 2-A-2	Work complexity will be positively related with cognitive overload	Supported
Hypothesis 2-B-1	Psychological empowerment will be positively related with proactive creativity	Supported
Hypothesis 2-B-2	Cognitive overload will be positively related with responsive creativity	Supported
Hypothesis 2-C-1	Psychological empowerment will mediate the relationship between work complexity and proactive creativity	Supported
Hypothesis 2-C-2	Cognitive overload will mediate the relationship between work complexity and responsive creativity	Partially supported
Hypothesis 3-A	Ambiguity tolerance will positively moderate the relationship between work complexity and psychological empowerment	Supported
Hypothesis 3-B	Ambiguity tolerance will negatively moderate the relationship between work complexity and cognitive overload	Supported
Hypothesis 4-A-1	Innovative cognitive style will positively moderate the relationship between psychological empowerment and proactive creativity	Not supported
Hypothesis 4-A-2	Innovative cognitive style will positively moderate the relationship between cognitive overload and responsive creativity	Not supported
Hypothesis 4-B-1	Supervisor support for creative performance will positively moderate the relationship between psychological empowerment and proactive creativity	Not supported
Hypothesis 4-B-2	Supervisor support for creative performance will positively moderate the relationship between cognitive overload and responsive creativity	Not supported

# CHAPTER V: DISCUSSION

## 1. Overall findings

This study had three major purposes. The first purpose was to examine the argument that work complexity is positively related to conceptually different types of creativity (George, 2007; Unsworth, 2001). To accomplish this, this study considered alternative psychological mechanisms underlying the relationship between work complexity and different types of creativity. Consequently, the second purpose was to propose and examine these alternative psychological states. The third purpose was to examine ambiguity tolerance as a moderator of the relationship between work complexity and psychological states.

This study used both activation theory and self-determination theory to explain how work complexity stimulates different kinds of creativity. Self-determination theory distinguishes between intrinsic and extrinsic motivation to explain how individuals make choices, which would explain creative behavior primarily driven by either an internal or external driver for engagement as recent categorizations of creativity suggest (Unsworth, 2001). Apart from the already established intrinsic motivation-approach, the learned industriousness theory explains how extrinsic means may encourage motivation where individuals learn which performance dimensions that lead to reward and becomes motivated to perform them accordingly (Hammond et al., 2011; Eisenberg, 1992), recognizing that there might be real sources of extrinsic motivation for creativity in organizations where employees experience external pressure to solve problems and take advantage of opportunities (George, 2007).

Furthermore, activation theory explains how individuals through mental arousal or activation become motivated to function effectively and is useful in understanding how employees respond to work complexity. People will seek activation through different types of stimulation related to work-tasks such as novelty, complexity, and variation (Scott, 1966). This would explain why some employees maintain and increase motivation and performance through work complexity, whereas others' performance is decreased due to overly high activation levels, resulting in relatively lower levels and different types of creative performance.

As the main effect of this study it was therefore proposed that work complexity is positively related to both proactive and responsive creativity, rather than a general form of creativity, recognizing the distinctiveness of the different creativity constructs. However, support was only found for the relationship between work complexity and proactive creativity. A possible explanation to why no support was found for the relationship between work complexity and responsive creativity might be a backlash from the ambition to differentiate between the dependent variables and operationalize responsive creativity as a type of minimum engagement level in creativity. This somewhat negative framing of the items might have affected the responses for this variable through a so-called other-protection motive, a reluctance to deliver negative feedback to others even though survey responses were confidential (Jeffries & Hornsey, 2012). The finding that work complexity is positively related to proactive creativity lends further support to the intrinsic motivation-approach found in previous research. However, it also suggests that work complexity is not only related to creativity in its general form, but also has the potential to stimulate voluntary and proactive components associated with creative efforts. All in all, this indicates that further endeavors to distinguish and test different types of creativity and its respective sources are justified.

By further reconnecting this theoretically, one interpretation would be that intrinsic motivation, as compared to extrinsic motivation, further stimulates the interest, confidence, and excitement among individuals, enabling them to engage in more cognitively demanding creative behavior, as suggested by earlier research (Hackman & Oldham, 1980). Regarding the use of activation theory in this study, an important assumption was that individual response to work complexity differs, where certain employees find the high level of work complexity as optimal, creating a positive stimulant to subsequent outcomes, manifested in proactive creativity. Employees that find the work complexity to be overstimulating was assumed to engage in sub-optimal behavior, so called satisficing, expressed as minimum level engagement in creativity. Support for this theoretical assumption was partly found in the way that work complexity indeed appears to lead to two distinct responses, moderated by employees' ambiguity tolerance, and that employees stimulated to the right extent subsequently engaged in proactive creativity.

Thus, in the next step, alternative psychological responses to work complexity was proposed and examined. Karasek's demand-control model of job stress (Karasek & Theorell, 1990) and the job demands resources model of burnout (Demerouti et al., 2001) were used as a theoretical rationale and framework to illustrate how job characteristics might create substantially different paths for individual employees, where in the presence of work related stressors, psychological strain and even physical illness might occur. On the contrary, in the absence of these work related stressors, an individual employee might engage in active learning, and even develop the motivation to develop new behavior patterns (Karasek & Theorell, 1990). Specifically, psychological empowerment and cognitive overload were proposed as variables that would be positively related with work complexity, and results indeed supported these hypotheses. Psychological empowerment was hypothesized to be positively related with proactive creativity and cognitive overload was hypothesized to be positively related with responsive creativity, and results also supported these

hypotheses. It was also hypothesized that psychological empowerment mediate the relationship between work complexity and proactive creativity. Results indicated the presence of partial mediation, which is a result that is an overall replication of previous studies following the intrinsic motivation-approach, however this time related to proactive creativity specifically. The intrinsic motivation-approach states that certain job characteristics create a favorable psychological response that stimulates motivation. Motivation then acts as a driving force for behavior with subsequent positive effects on a number of work-related outcomes, including creativity (Hackman & Oldham, 1980). Finally, it was hypothesized that cognitive overload would mediate the relationship between work complexity and responsive creativity. This hypothesis was framed using the Conservation of Resources Model (COR) where it was proposed that a negative reaction to work complexity, manifested by cognitive overload, would create a depletion of resources. In this stage, employees will carefully select which resources to engage in order to satisfy for example performance goals at work, thus only engaging in the creative activities perceived necessary by the employee. Although no support for the mediating effect of cognitive overload in the relationship between work complexity and responsive creativity was found, results nevertheless indicated that cognitive overload has a significant indirect effect. A number of possible explanations are available for these somewhat inconclusive results. Given the utilitarian nature of the Conservation of Resources Model, although there often is an innate demand for creative behavior inherent in certain job characteristics, employees might nevertheless perceive other behavior as more important in their work role. Moreover, the possibility also exists that even more serious consequences might entail a state of cognitive overload, including turnover intentions (Jones et al., 2007) and deviant behavior (Lee & Allen, 2002). The results nevertheless indicate that individual employees who experience cognitive overload will indeed focus their resources where the potential return on investment is the greatest, as suggested by the Conservation of Resources Model (Halbesleben & Bowler, 2007; Hobfoll & Freedy, 1993). In other words, employees with high perceived workload will merely engage in the

type of creative effort that is required, implicitly or explicitly by their job tasks, and not spend their remaining resources on creative behavior that is more cognitively demanding. Future research would benefit from further examination of alternative psychological responses to work complexity and how these responses impacts creativity.

Analyses also showed that the country-control variable was significantly related to both cognitive overload and responsive creativity were people from the Swedish sample reported higher levels of both of these variables. This result might seem intuitively contradictory given the stressful work environment and job dissatisfaction often reported in many South Korean workplaces (Park & Lee, 2009). Although no firm conclusions can be drawn from the results of this study alone, one speculation is that certain variables related to culture explain some of these results. For example, earlier research has found that cultural individualism is significantly related to the propensity to voice discontent in a consumer-marketplace setting (Chelminski & Coulter, 2007) and other studies has also found that individuals exhibiting strong individualistic values in an individualistic culture reported certain psychological disadvantages such as stress due to smaller social support networks, lower intentions to seek help from a variety of sources et c (Scott et al., 2004). These findings might at least provide a tentative explanation as for what may have caused Swedish respondents to respond somewhat more negatively to work complexity. Since the study found these divergent results between countries, some form of cross-cultural factor might be present, and future studies would benefit from including cultural variables to identify and entangle what this potential cultural effect might be.

This study also examined the moderating effect of ambiguity tolerance in the relationship between work complexity and the psychological states of psychological empowerment and cognitive overload. As hypothesized, ambiguity tolerance moderated the relationship between work



complexity and psychological empowerment positively and moderated the relationship between work complexity and cognitive overload negatively. The main argument behind this relationship was that individuals with a high level of ambiguity tolerance will have a more positive attitude towards novelty, complexity, and uncertainty, which will be associated with a higher probability to respond favorably to the ambiguous elements and situations that comes with having a challenging and complex job. On the contrary, an individual with a low level of ambiguity tolerance, or in other words an individual that does not enjoy, or even responds negatively to ambiguous situations, will have to devote more cognitive resources to simply just cope with the challenges that work complexity entails, increasing the likelihood of experiencing a higher perceived workload. Examining individuals' perceptions of themselves and their work tasks and the immediate and further consequences of this in relation to creativity research might be warranted in future research.

Lastly, this study also examined the moderating effect of innovative cognitive style and supervisor support for creative performance in the relationship between psychological empowerment and proactive creativity and cognitive overload and responsive creativity. However, no support was found for either of the variables for any of the hypotheses. Although it is somewhat intuitively surprising that supervisor support for creative performance did not have any moderating effect, previous studies have reported similar non-significant results on supervisor-related variables on job performance outcomes (Van Dyne et al., 2002). Similarly, previous studies have also failed to find significant and positive relationships between intuitive problem-solving style and innovative behavior (Scott & Bruce, 1994). One reason that might explain the insignificant moderating effect for both of these variables is their relationship with perceived innovative climate, where the need to be innovative has been linked with environmental conditions (Isaksen & Kaufmann, 1990). Although creativity has been argued to be unrelated to any specific occupation or job title (Mumford et al., 2002) it is nevertheless plausible that innovative cognitive style as well as

contextual variables such as supervisor support for creative performance might be more critical factors in work tasks that are explicitly creative, unlike the tasks of the general management respondents that the majority of the sample for this study consisted of. It has also been argued that a high level of education might affect the receptivity to leader role expectations due to perceived status equality (Scott & Bruce, 1994), which also might be relevant to supervisor support for creative performance in this setting.

## **2. Implications**

The results from this study bring about a number of theoretical and practical implications that offers a contribution to the research field in question. As for the theoretical implications, the results from this study indeed show that there are good grounds for the separation of creativity into different types of creativity as suggested by earlier conceptual work (Unsworth, 2001). Although the main effects between work complexity and different types of creativity were somewhat inconclusive, when considering the intermediating psychological mechanisms, different types of creativity indeed seems to be related to different psychological reactions to work complexity. These results gives further support to the intrinsic motivation-approach, but also entails that the combination of alternative theoretical models might be a fruitful approach for future research, especially in relation to the mediating psychological mechanisms. Another integral part of this study was the importance of ambiguity tolerance and its explanation power as a moderator in terms of understanding individual reactions to work complexity. The results of this study shows that the consideration of non-generic approaches to work complexity is definitely called for, giving room for a more flexible and dynamic interpretations of previously hypothesized relationships between variables.

The results from this study also entail a number of practical implications. The most crucial practical implications are related to the finding that different levels of ambiguity tolerance moderates the relationship between different types of psychological reactions. Depending on the desired or required type of creative effort, these results indicate the importance of considering cognition-related traits in recruitment decisions where for example jobs with high demands of creative effort with proactive components might benefit from recruiting individuals with an innate high level of ambiguity tolerance. The results of this study indicated the advantages of a high level of ambiguity tolerance given how it positively moderated the relationship between work complexity and psychological empowerment. However, the results also showed that ambiguity tolerance negatively moderated the relationship between work complexity and cognitive overload. This entails that workplaces or supervisors might benefit from ambiguity-reducing efforts at the workplace in spite of the trait-like nature of ambiguity tolerance. Earlier studies related to individuals' cognitive motivation have shown that these kinds of buffering attempts from the organizational environment might be especially important for individuals with a lower threshold for enjoying cognitively effortful activities (Cacioppo et al., 1996).

### **3. Limitations**

This study has some limitations that should be mentioned. First of all, this study used a cross-sectional design which precludes the drawing of strong causal inferences between variables. A longitudinal or field-experimental research approach could be adopted for further related research. Secondly, since the creativity measures were exclusively made for this study, they would need some further validation. Somewhat related, by distinguishing between proactive and responsive creativity, this study makes a standpoint regarding the mutual exclusivity between the constructs that can be contested. For example, the study design does not admit that responsive and proactive creativity

might be more intimately intertwined. Although an employee engages in proactive creativity, it might be connected with more extrinsic demands or requirements of creative effort. Future studies that further explore alternative study design and creative measures would be fruitful. Thirdly, the sample of this study consisted mainly of office workers engaged in general management. As discussed earlier, it is possible that this kind of job generally requires a moderate creative effort that does not fully capture the scope of the creativity measures used in this study. Further research would benefit from using a sample that for example has an explicitly high demand of creative requirements to overcome this possible sample bias.

## **CHAPTER VI: CONCLUSION**

Given recent calls for a more nuanced perspective on the processes that bring about creativity (George, 2007) as well as efforts to distinguish between conceptually different types of creativity (Unsworth, 2001), this study argued that work complexity is positively related to different types of creativity. This study used an approach where seemingly opposing psychological mechanisms as a response to work complexity stimulates both proactive and responsive creativity. This is an approach that expands the commonly used intrinsic motivation-approach by using alternative theoretical perspectives. Although somewhat inconclusive, the results of this study showed that work complexity indeed has the potential to lead to different types of creativity, stimulated through different processes. These results are consistent with earlier research following the intrinsic motivation-approach, but also indicate that alternative frameworks might indeed be called for. This study also found that an individual's level of ambiguity tolerance moderates the relationship between work complexity and the psychological response.

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## ABSTRACT IN KOREAN

복잡성과 창의성 간의 관계는 창의성 연구에서 오랫동안 논의되어 왔으며, 내적 동기가 그 관계를 매개하는 것으로 설명되어 왔다. 이 관계의 중요한 전제는 창의성 개념이 단일차원이라는 점이었다. 그러나, 최근 창의성에 관한 개념적 연구에서는 창의성이 다차원의 개념임을 밝힌 바 있다. 이는 창의성을 가져오는 프로세스에 대한 대안적인, 보다 (nuanced)한 관점이 필요함을 뜻한다. 따라서, 이 연구는 직무 복잡성이 창의성의 다양한 차원 (특히, 주도적 창의성과 수동적 창의성)과 연관된다는 주장을 증명함으로써 창의성 연구 흐름에 기여하는 것을 주된 목적으로 한다. 이를 통해, 이 연구는 일반적으로 통용되던 내적 동기부여 측면의 접근에서 대안적인 이론적 관점으로 연구의 관점을 확장하고자 한다. 이 연구에서 제시하는 대안적 관점은 직무 복잡성과 창의성의 하부 차원을 연결하는 심리적 매개 매커니즘을 밝히는 데 있다. 마지막으로, 모호함을 용인하는 정도를 개인의 직무 복잡성에 대한 즉각적인 심리 반응에 영향을 주고 그에 따른 결과를 불러일으킬 잠재변수로 고려하여, 잠재직무 복잡성과 심리적 상태의 관계 사이의 조절변수로 포함하였다.

본 연구에 사용된 표본은 한국과 스웨덴의 다양한 조직과 산업에서 수집되었으며, 총 143 쌍의 상사-부하로 구성된 표본이 분석 대상이 되었다. 가설 검증은 위계적 회귀모형을 사용하였으며, 매개효과, 상호작용효과와 조절효과의 검증에 있어 표준 통계 절차를 따랐다.

제시된 연구모형의 가설들은 부분적으로 지지되었으며, 직무 복잡성이 창의성의 서로 다른 유형에 각기 다른 프로세스를 통해 연결됨을 밝혔다. 본 연구는 앞선 내적 동기로 접근한 존연구들과 일관된 결과를 보이고 있으나, 대안적인 프레임워크가 필요하다는 점을 시사한다. 또한 직무 복잡성과 심리적 반응의 관계를 모호함을 용인하는 정도가 조절하고 있음을 밝혔다. 이로써, 본 연구는 이론적 시사점뿐 만 아니라, 회사의 실무자가 필요한 창의적 노력의 유형에 따라 어떻게 다른 방식으로 접근해야 할지 제안하는 실무적 시사점을 제공한다. 마지막으로, 이러한 연구결과를 바탕으로 향후 연구 방향에 대해 논의하였다.

**Keywords:** work complexity; ambiguity tolerance; cognitive overload; psychological empowerment; proactive creativity; responsive creativity

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