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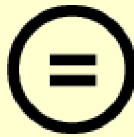
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SOCIAL COMPARISON PROCESS IN INDIVIDUAL CREATIVITY

**EFFECT OF UPWARD SOCIAL COMPARISON WITHIN
TEAMS THROUGH AFFECTIVE AND COGNITIVE
PROCESS WITH THE ROLE OF CONTEXT**

사회비교이론 관점에서 살펴본 개인창의성:
팀내 상향비교에 대한 감정적, 인지적 과정의 매개효과 및
직무창의성요구와 창의적 자원의 조절효과

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양 유 하

ABSTRACT

SOCIAL COMPARISON PROCESS IN INDIVIDUAL CREATIVITY: EFFECT OF UPWARD SOCIAL COMPARISON WITHIN TEAMS THROUGH AFFECTIVE AND COGNITIVE PROCESS WITH THE ROLE OF CONTEXT

YUHA YANG

Department of Business Administration

The Graduate School

Seoul National University

Employee creativity has become the essential element for the survival and success of contemporary organizations under the fast-changing business environment. The increase in the importance of team systems in the flood of information has increased the attention to creativity in social relationship.

This study combines social comparison theory (Festinger, 1954) and a dual-pathway model of creativity (De Dreu, Baas, & Nijstad, 2008) to propose a framework that exhibits the process in which the social comparison of creative ability between team members influences individual creativity. In particular, this study focuses on the upward social comparison that individuals experience frequently in real team situations (Gerber, Wheeler, & Suls, 2018). I proposed the process model that upward social comparison influences individual creativity through emotional and cognitive responses.

This study examined the emotional response to upward social comparison within teams based on two dimensions, namely, activation and valence, to answer

recent calls for the shift to the dimensional approach of emotions from multiple disciplines. Cognitive demotivation was also added to the cognitive flexibility and persistence, which are the two cognitively motivated states from the dual pathway model, in examining cognitive responses following emotions. This study also explored the processes that emotional and cognitive processes lead to three aspects of creativity, namely, radical creativity, incremental creativity, and creative disengagement.

Using a multi-source multi-wave data, this study empirically validated that upward social comparison largely positively affects emotions and is related to radical and incremental creativity through cognitive flexibility. This research provides novel insights for researchers and practitioners by offering theoretical elaboration of the effects of social comparison processes on creativity and providing unique empirical validation of the model in the context of teams in actual organizations.

Keywords: creativity, social comparison theory, emotion, cognition, dual pathway model.

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TABLE OF CONTENTS

LIST OF TABLES.....	6
LIST OF FIGURES	7
CHAPTER 1. INTRODUCTION.....	8
CHAPTER 2. LITERATURE REVIEW	15
1. Review of Creativity Research	15
1.1. Definitions of Creativity	15
1.2. Radical and Incremental Creativity.....	17
1.3. Antecedents of Creativity	18
1.4. Emotion and Creativity	22
1.5. Dual Pathway to Creativity.....	24
2. Review of Social Comparison Theory.....	26
2.1. Definition of Social Comparison.....	26
2.2. Upward and Downward Comparison.....	27
2.3. Affective Consequences of Social Comparison.....	29
2.4. Focus on Upward Comparison	31
2.5. Discrete Emotion to Emotion Circumplex Model.....	33
2.5.1. Discrete Emotions	34
2.5.2. Dimensional Approach	35
2.5.3. Discrete Emotion to Dimensional Approach	38
2.6. Possible Determinants of the Affective Consequences of Social Comparison.....	40
2.6.1. Relevance of the Comparison Dimension	42
2.6.2. Perceived Attainability	44
2.6.3. Social Comparison Orientation	48
3. Conclusions	50
CHAPTER 3. THEORETICAL FRAMEWORK.....	53
1. Introduction	54
2. Theoretical Development and Hypotheses	58
2.1. Social Comparison Theory.....	59
2.2. Organizational Context for Creativity: Creative Requirement	62
2.3. Organizational Context for Creativity: Resource for Creativity	63
2.4. Intervening Process: Emotional Reaction to Upward Social Comparison.....	64
2.5. Intervening Process: Cognitive Process.....	68
2.6. Radical Creativity, Incremental Creativity, and Creative Disengagement	72
CHAPTER 4. EMPIRICAL STUDY	78
1. Sample and Data Collection Procedure.....	78
2. Ethical Considerations	80
3. Measurement.....	80

CHAPTER 5. RESULTS	85
1. Preliminary Analysis	85
2. Multilevel Analytic Strategy	86
3. Hypotheses Testing	90
CHAPTER 6. DISCUSSION	99
Summary of Findings	99
Implications on Creativity Literature.....	100
Implications on Social Comparison Literature.....	102
Implications to Emotion–Cognition Literature	106
Practical Implications.....	109
Limitations and Future Research Directions	110
CONCLUSION	112
REFERENCE	114
APPENDIX.....	130
국문초록.....	134

LIST OF TABLES

Table 1 Confirmatory Factor Analysis Models	87
Table 2 Means, Standard Deviations, Correlations for Variables.....	88
Table 3 Multilevel Analysis Predicting Creative Outcomes	91
Table 4 Results of Moderation Analyses Predicting Affective Reactions.....	93
Table 5 Indirect Effect Using Monte Carlo Confidence Intervals (1).....	97
Table 6 Indirect Effect Using Monte Carlo Confidence Intervals (2).....	98
Table 7 Moderated Mediation Effects Using Monte Carlo Confidence Intervals.....	98

LIST OF FIGURES

Figure 1 Two-tier model of creative thinking	16
Figure 2 Dual pathway model	25
Figure 3 Affective responses to social comparison.....	31
Figure 4 Russell’s circumplex model of affect.....	35
Figure 5 Circumplex model of affect combined with the PANAS model.....	36
Figure 6 Alternative dimensional structure of emotions.....	37
Figure 7 Emotional region.....	40
Figure 8 Conceptual framework.....	53
Figure 9 Interaction between Upward Social Comparison and Team Context on Affective Reactions	95
Figure 10 Results of the Main Effect Model.....	96

CHAPTER 1. INTRODUCTION

“Creativity is contagious. Pass it on.”

- Albert Einstein

After four decades of research and theorization, the topic creativity has become more popular than ever (Zhou, Wang, Bavato, Tasselli, & Wu, 2019). In the contemporary dynamic business environment, employee creativity is crucial for the survival and prosperity of an organization. To understand creativity in contemporary organizations where competitions and cooperation are significantly increasing in intensity, studies on the social aspect of creativity have emerged (Perry-Smith & Shalley, 2003).

Understanding the dynamics of individual members and their social environments is critical in improving productivity and effectiveness in group settings because the abilities and reactions of these members are greatly affected by their social environments (Nye & Brower, 1996; Levine, Resnick, & Higgins, 1993). As both task complexity and required expertise exceed the cognitive capability of individuals, contemporary organizations have begun to adopt team systems. Those organizations that crave for creative outcomes tend to assign all their capable human resources to the same team (e.g., R&D or task force teams for creative projects). All members of this team are compelled to cooperate or compete with one another. Under such conditions, these individuals compare their abilities, competencies, and performances with those of other members and then relate the comparison results to themselves. Therefore, understanding the social comparison process is key to gaining insights into the behaviors and performance of employees in contemporary organizations. In this respect, the effects of social cognitive process within teams on creativity must be investigated by using social comparison theory (Festinger, 1954).

In a process where social comparison affects creativity, emotion works as a mediating

mechanism to explain the relationship between these variables. Creativity can be achieved by using a broad array of cognitive categories and by gathering ideas from persistent hard work, whereas emotion helps promote or impede both paths to creativity (De Dreu, Baas, & Nijstad, 2008). To investigate the relationship between the social comparison process and creativity, I identify the role of emotion as a mediating mechanism.

A recent meta-analysis has revealed that people tend to make upward comparisons with slightly better-performing individuals even if doing so may pose a psychological threat or bring forth negative emotions (J. P. Gerber, Wheeler, & Suls, 2018). Especially when abilities are concerned, classic social comparison theory posits that individuals tend to compare themselves with better people to improve their performance level (Festinger, 1954). Given that organizational teams are generally packed with competent employees to achieve a positive synergy, employees under such environments tend to feel pressured to improve their performance and make upward instead of downward comparisons. Therefore, how upward comparison with more creative coworkers affects the creative performance of an individual warrants further study, and some strategies for preventing the negative effects and promoting the positive effects of upward comparison must be formulated.

Therefore, my research examines how the interactions of employees with better-performing coworkers (i.e., upward social comparison of creative ability) influence their creative performance and what are the connecting mechanisms between these two groups. I use social comparison theory to test my hypotheses on how the perceived level of creative ability relative to coworkers influences an employee's creativity. To further understand the relationship between upward social comparison and individual creativity, I propose emotional reactions and cognitive processes as mediating mechanisms of such relationship. With an aim to contribute to the literature, I adopt the circumplex model of affect with valence and arousal as two axes to describe the emotional reactions to social comparison.

Social Comparison in Organizational Behavior

Social comparison is a prominent social cognitive process of “thinking about information about one or more other people in relation to the self” (Wood, 1996, p.520). In other words, social comparison is (1) an everyday or every-moment process that happens among employees (Spence, Ferris, Brown, & Heller, 2011) that (2) pervades nearly all aspects of human emotion and behaviors (e.g., subjective well-being, Kross et al., 2013; eating disorders and body dissatisfaction, Myers & Crowther, 2009; and self-enhancement, Wood, Taylor, & Lichtman, 1985).

Previous studies suggest that “fully understanding human behavior in the workplace requires appreciating social comparison processes is far from hyperbole” (Greenberg, Ashton–James, & Ashkanasy, 2007, p. 37). The significance of the social comparison process in organizational settings has been largely acknowledged. For example, the organizational justice literature has acknowledged the comparative nature of justice assessment. Judgment of equity perception is based on one’s social comparison with his/her coworkers than on general expectations of one’s outcomes (Adams, 1965; Austin, 1977; Austin, McGinn, & Susmilch, 1980). Meanwhile, from the distributive, procedural, and interactional perspectives, justice assessment in organizations is clearly comparative in nature.

Social comparison theory has been successfully applied to understand various organizational phenomena and has been empirically validated in different fields of organizational research. Practically, the social comparison process is applied to explain diverse employee behaviors. Employees use comparison information to assess their own performance (Greenberg et al., 2007). For example, how managers evaluate their career progression in comparison with that of others can determine their career satisfaction and turnover intentions (Eddleston, 2009). Employees in virtual work environments (i.e.,

working in physically distant locations from their coworkers), where little information is available and uncertainty runs high, eagerly seek social comparison information (Conner, 2003). Previous studies suggest that social comparison can influence affective behavior, stress, and leadership in organizations (Greenberg et al., 2007). For instance, subordinates in high leader–member exchange relationships tend to make upward comparison with their leaders and are prone to upward assimilation, thereby suggesting that these subordinates aspire to become like their leaders. Ongoing studies have also demonstrated the practical validity of social comparison theory in explaining organizational behaviors.

Much of the work in contemporary organizations is accomplished by teams, which compromises the growing complexity of tasks that frequently exceeds the capacity of individuals (Cooke et al., 2003). Previous studies have defined a team as “a distinguishable set of two or more people who interact dynamically, interdependently, and adaptively toward a common and valued goal/object/mission” (Cooke et al., 2003, p. 180). In this sense, increasing the adoption of team systems also increases the role of social comparison in various sub-areas of organizational behavior. Given that comparing oneself with coworkers is virtually inevitable, the importance of social comparison can never be exaggerated. Moreover, despite the importance of social comparison process in understanding individuals within an organization, comparison studies remain lacking in the organizational behavior literature.

Social Comparison and Creativity

With the prevailing adoption of team systems as a major organizational structure and the increasing emphasis on *creativity as a social process* (Perry–Smith & Mannucci, 2017; Perry–Smith & Shalley, 2003; Rouse, 2018), creativity is affected by social relationships with others in the work community. For example, social relationships, such as the number of weak ties, is suggested to be generally beneficial for individual creativity (Perry–Smith

& Shalley, 2003). For instance, empirical studies on oil field service companies show that supportive supervisors and moods interactively contribute to employee creativity (George & Zhou, 2007), while a meta-analysis reveals that an open team climate where members are encouraged to socially interact in open discussions generally obtain high creativity scores (Ma, 2009). Therefore, the employees' social interactions with other organizational members significantly contribute to creativity in real-world organizations (Amabile, 1988; Woodman, Sawyer, & Griffin, 1993).

Although the importance of social interactions in developing creativity has been well acknowledged, extant studies still have a long way to go to achieve a sufficient understanding of the social aspect of the creativity process. Specifically, the fact that people have the constant innate drive to compare themselves with others suggests that the effect of social comparison process on creativity remains obscure. In particular, previous studies have demonstrated that social comparison may stimulate individual creativity. Given the possible effect of social comparison on employee creativity, an increasing number of studies have revealed that social comparison is related to brainstorming productivity (e.g., laboratory brainstorming, Dugosh & Paulus, 2005; online brainstorming, Michinov & Primois, 2005; Shepherd, Briggs, Reinig, Yen, & Nunamaker, 1995). Idea generation at brainstorming or daily work situations is an important basis for creativity (Paulus & Yang, 2000). Meanwhile, the effects of implied social comparison situations, such as competitions (Amabile, 1982; Conti, Collins, & Picariello, 2001) or rivalries (Clydesdale, 2006), on creativity are clearly understood. In contemporary organizations with severe competition and fast-changing technologies, creativity plays an indispensable role in achieving innovation and effectiveness. However, the link between social comparison and individual creativity has been largely neglected in previous research.

Comparison with others, especially in an organizational context, does not always

deliver favorable results. Given that successfully managed teams are characterized by clear goals, high standards of excellence, and competent team members, these teams are often packed with competent members who are pressured to achieve a clearly defined high goal (Fleming & Monda-Amaya, 2001). Therefore, comparison with coworkers may lead to a sense of inferiority or incompetency, which in turn may decrease the cognitive and behavioral performance of an employee, including his/her creativity. In this case, managers must focus on those team members who are suffering from a downside social comparison. Despite the growing evidence that supports the relationship between social comparison and creativity, very few studies have attempted to clarify such relationship and its mechanism. As researchers and organizational managers increasingly focus on improving creativity in organizational teams (Choi, 2007; Y. Shin, Kim, Choi, & Lee, 2016), how social comparison promotes or impedes creativity in organizations must be understood. Therefore, I aim to investigate the effect of social comparison on employee creativity in organizational teams and clarify its mechanism.

Overview of chapters

To achieve a comprehensive understanding of employee creativity from the social comparison perspective, I organize my study as follows. Chapter 1 presents the introduction and background of this study. Chapter 2 reviews the related studies and presents the theoretical background of this work. This chapter is divided into two sections. The first part reviews the creativity studies and highlights the importance of their social aspects, while the second part presents an in-depth review of social comparison theory and the affective consequences of social comparison. I specifically review recent studies from various disciplines in support of the dimensional approach of emotions. Chapter 3 presents the theoretical framework along with the research hypotheses and the corresponding rationales. Chapter 4 discusses the data collection method, the nature of the sample, the

employed measures, and the adopted data analysis strategies. Chapter 5 presents the results of the data analysis, including the descriptive statistics and primary analyses involved in the hypotheses testing. Chapter 6 presents the overall findings of this work, their theoretical and practical implications, the research limitations, and some directions for future research.

CHAPTER 2. LITERATURE REVIEW

1. Review of Creativity Research

1.1. Definitions of Creativity

Since Guilford's (1950) call for a systematic study on creativity, this concept has received much attention from numerous researchers across various disciplines. Creativity in an organization is defined as an employee's generation of novel and useful ideas, products, and procedures (Amabile, 1983; Oldham & Cummings, 1996). Creative outcomes need to be *novel* such that the employees' creative contributions, including products, ideas, and practices, must be unique and original. Another aspect that creative outcomes need to entail is *usefulness*; new contributions must provide some value to an organization and be relevant to its goals.

Given that creativity can be used to describe both an outcome and a process (Shalley & Zhou, 2008), many researchers have investigated the creative process from different aspects. Runco and Chand (1995) proposed a componential model that explains the basic components of creative thinking (Figure 1). They identified problem finding, ideation, and judgmental process as three sets of skills needed for creative thinking. Problem finding involves the identification and definition of problem, ideation represents ideational fluency, ideational originality, and ideational flexibility (Guilford, 1967; Torrance, 1966), and evaluation refers to the valuation and critical evaluation of an idea. Zhang and Bartol (2010) suggested that the creative process involves three aspects of employee involvement, namely, problem identification, information searching and encoding, and idea and alternative generation. The aforementioned descriptions of the creative process all agree that individuals must identify problems, define them, and eventually solve them.

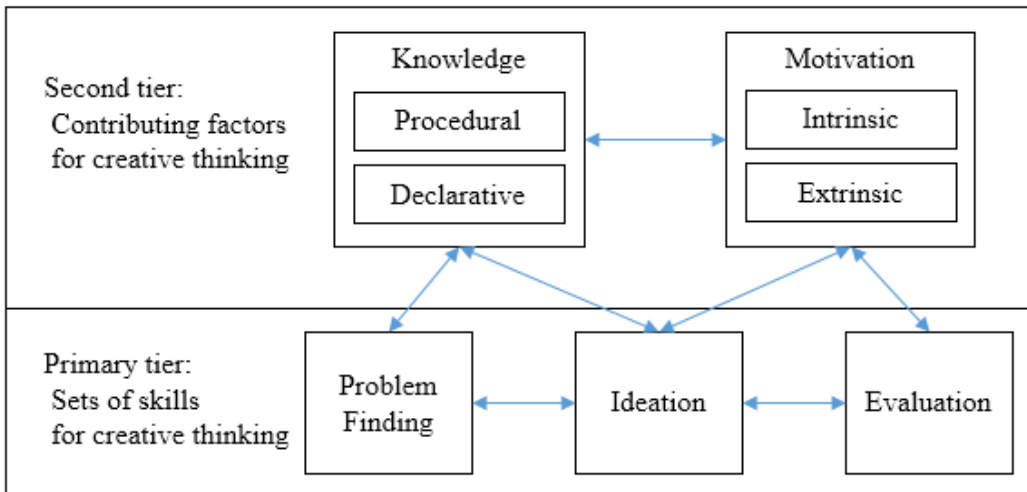


Figure 1 Two-tier model of creative thinking (adapted from Runco and Chand, 1995)

Creativity as an outcome is defined as a combination of three distinct yet interrelated components of fluency, originality, and flexibility (Guilford, 1967; Torrance, 1966). *Originality* is one of the defining characteristics suggested by Amabile (1988) that refers to the uniqueness of insights, ideas, or solutions. *Flexibility* refers to the ability to “approach a problem or issue from new perspectives” (Rietzschel, De Dreu, & Nijstad, 2007, p. 856) and can be measured as the number of different categories that a person uses in the ideation process. A flexible employee is productive in developing differentially classified ideas. For example, when generating ideas for the possible uses of a pen, an employee who mentions that the pen can be used as a chopstick, drumstick, and baton is more flexible than someone who mentions that a pen can be used to write a poem, thesis, and diary entry. *Fluency* is measured as the number of ideas developed in the same category. A person who generates 10 ideas in 1 category is more fluent than a person who generates 5 ideas in 5 categories. Although a person does not have to be flexible and fluent at the same time, s/he must be original in order to be creative because originality or novelty is a key characteristic that defines creativity.

1.2. Radical and Incremental Creativity

In the contemporary dynamic business environment, employees and organizations are required to respond to creative requirements, which may range from minor adaptations to radical breakthroughs (Gilson & Madjar, 2011; Mumford & Gustafson, 1988). Accordingly, different types of creativity have been proposed by several researchers (e.g., seven types of creativity contributions, Sternberg, 1999; a matrix of four creativity types, Unsworth, 2001; radical and incremental creativity, Gilson & Madjar, 2011) and each type of creativity has different drivers. Researchers continue to overcome the unidimensional view of creativity and theorize various types of creativity (e.g., George & Zhou, 2007; Gilson & Madjar, 2011; Mumford & Gustafson, 1988; Sternberg, 1999; Unsworth, 2001), thereby introducing a wide range of conceptualizations (e.g., routine performance, incremental creativity, radical ideas, and major creative contribution). However, one of the most widely accepted definitions is that creativity lies on a continuum between the minor adaptation of familiar algorithms and radical set-breakings. Accordingly, Gilson and Madjar (2011) defined two forms of creativity, namely, incremental creativity and radical changes, of which *incremental creativity* refers to modifications made to existing practices and products and *radical changes* involve revolutionary ideas that substantially transform existing practices, processes, or platforms.

Researchers have commented that distinct processes should lead to different types of creativity (Mumford & Gustafson, 1988; Unsworth, 2001). The underlying psychological process for major contributions to the organizations, for which employees generate new ideas and solutions to various problems, must differ from what is necessary for the minor contributions, such as employee extension of their existing knowledge and generation of solutions to limited problems (Ghiselin, 1963). With regard to creativity types, previous studies reveal that certain processes and antecedents must lead to radical breakthroughs

while other processes and antecedents may engender a motivating force for incremental changes (Unsworth, 2001).

Accordingly, Gilson and Madjar (2011) suggested that intrinsic motivation and problem-driven, abstract theory-related creative ideas are linked to radical creativity. They also revealed that extrinsic motivation and solution-driven, concrete practices-based ideas are associated with incremental creativity. Madjar, Greenberg, and Chen (2011) identified willingness to take risks, resources for creativity, and career commitment as antecedents of radical creativity and added that the presence of creative coworkers and organizational identification are significant antecedents of incremental creativity. Meanwhile, Gilson et al. (2012) found that supportive supervision is related to incremental creativity and that intrinsic motivation is significantly related to radical creativity (Gilson, Lim, D’Innocenzo, & Moye, 2012). With regard to the source of knowledge for creativity, Jaussi and Randel (2014) found that along with creative self-efficacy, the external search for knowledge is related to radical creativity in organizations. Meanwhile, an employee’s search for ideas within the organization (i.e., internal search for new ideas) is related to both radical and incremental creativity.

1.3. Antecedents of Creativity

Since Amabile (1983), a large number of studies have emerged over the past three decades to investigate the predictors and underlying mechanisms of creativity. The componential theory of creativity posits four requisites for creativity, including (1) an intrinsically (and extrinsically, as in the dynamic componential model of Amabile and Pratt, 2016) motivated individual with (2) high domain-relevant skills (expertise) and (3) high domain-relevant processes (creative thinking) who works in (4) a creativity-supportive environment. Based on this theory, scholars have examined various personal and contextual variables that promote or inhibit creativity through motivational mechanisms.

Initial studies on creativity have investigated various personal variables, including biographical factors, personality, cognitive style, and motivational orientations pertinent to creativity. These studies have focused on personal characteristics, such as broad interests, toleration of ambiguity, and self-confidence, all of which lead to individual creativity (Amabile, 1983; Barron & Harrington, 1981; F. D. Davis, 1989). To determine those personality factors that lead to creativity, the creative personality scale (Gough, 1979) has been developed, and the results indicate that those individuals who are self-confident, have wide-ranging interests, and have reflective characteristics show high creative performance (Oldham & Cummings, 1996). These studies have also shown that among the five personality factors, openness to experience has been consistently linked to higher creativity (Feist, 1998, 2019; Silvia et al., 2008). Kirton (1976) suggested that individuals have adaptive or innovative cognitive styles (adaption–innovation theory, Kirton, 1976), of which the innovative cognitive style is generally related to creativity because innovators are willing to take risks that are critical in the development of new solutions (Kirton, 1994; Tierney, Farmer, & Graen, 1999). Meanwhile, intrinsic motivation has been consistently reported to be positively related with creativity because intrinsically motivated people devote their time and effort to identifying problems from numerous perspectives, use diverse sources to gather information, and search for various alternatives (Amabile, 1985; Hennessey & Amabile, 1998; Zhang & Bartol, 2010).

Those researchers who show interest in contextual factors that promote individual- or group-level creativity have considered broad dimensions of work environments, including job and workplace characteristics, relationships with coworkers and supervisors, and support and encouragement from groups or organizations (e.g., Amabile, Conti, Coon, Lazenby, & Herron, 1996; Amabile & Gryskiewicz, 1989; Isaksen, Lauer, & Ekvall, 1999; Tierney et al., 1999; Woodman et al., 1993). The design of jobs has received much attention

as an important antecedent of creativity (West & Farr, 1990). If a job is complex (i.e., requiring a high level of autonomy, feedback, significance, skill variety, and identity; Oldham & Hackman, 1981), then this job is likely to psychologically motivate employees and induce them to develop creative ideas (Oldham & Cummings, 1996; Sung, Antefelt, & Choi, 2011). Several researchers have examined the relations between the supervisor's leadership style and the employees' creativity (Amabile et al., 1996; Choi, 2004b; Oldham & Cummings, 1996). Supportive supervisors provide their employees with developmental and informational feedback, show concern for their feelings, and encourage open interactions and employee participation in idea development (Choi, 2004b; Deci, Connell, & Ryan, 1989). Supportive leadership has been reported to positively influence the intrinsic motivation and creativity of followers (Amabile et al., 1996; Choi, 2004b; Oldham & Cummings, 1996; Shalley & Gilson, 2004). By contrast, the controlling behavior of leaders negatively affect employee creativity (Zhou, 2003; Zhou & George, 2001).

Coworkers or peer group members substantially influence individuals as immediate social surroundings. Supportive and nurturing coworkers enhance the intrinsic motivation of individuals and promote their creativity (Shalley, Zhou, & Oldham, 2004). For example, participative safety provides a non-threatening social environment that encourages the exploration of diverse alternatives without the threat of retaliation (Anderson & West, 1998). An open group climate can increase creative self-efficacy, which in return boosts creative performance (Choi, 2004). Amabile et al. (1996) found that supportive and encouraging coworkers can help boost employee creativity, while Zhou and George (2001) revealed that coworker support and informational feedback promote employee creativity.

By integrating the personal and environmental predictors of creativity, researchers have attempted to identify the psychological process model of creativity (Choi, 2004b; Liu,

Jiang, Shalley, Keem, & Zhou, 2016; Oldham & Cummings, 1996; Shalley et al., 2004). Oldham and Cummings (1996) posited that when provided with a supportive environment (supportive, non-controlling supervision), individuals with a creative personality demonstrate the highest level of creativity when performing motivating jobs (high job complexity). By focusing on the importance of social and contextual factors, Shalley et al. (2004) suggested that contextual conditions and personal characteristics may affect creativity through intrinsic motivation (Shalley et al., 2004). Personal and contextual factors have also been empirically validated to affect creative performance through creative self-efficacy and creativity intention (Choi, 2004b). In their recent meta-analytic examination, Liu et al. (2016) proposed motivational mechanisms, including personal and contextual predictors, that influence creativity through intrinsic motivation, prosocial motivation, and creative self-efficacy (Liu et al., 2016).

Despite the plethora of studies on creativity, these works have either viewed individuals as independent entities and investigate within-individual processes or examine collective processes involving group- or organizational-level creativity; meanwhile, only few studies have examined the interactive mechanism among members, which is ubiquitous in organizations. Contemporary organizations are characterized by their high dependency on team systems, where the vast majority of tasks are accomplished via teamwork. Although the notion of creativity as a social process has been widely accepted (Perry-Smith & Mannucci, 2017; Rouse, 2018), the importance of inter-member dynamics, including the social comparison process, has been neglected in the literature. Creative work is a social process that can be promoted through the effective inter-member dynamics with coworkers, and the increasing dependence of contemporary organizations on team systems emphasize the importance of interactive processes among team members. Therefore, the chasm between social comparison process and creativity must be bridged.

1.4. Emotion and Creativity

Among the many variables that are shown to predict creativity, “mood stands out as one of the most widely studied and least disputed predictors” (Baas et al., 2008, p. 779; De Dreu et al., 2008, p. 739). According to Baas et al. (2008), emotional states have long been accepted as one of the most influential prerequisites of creativity. Early studies on emotion and creativity tend to focus on the role of positive or negative mood in the ideation process. Initially, positive mood shows a positive association with creativity (Baas et al., 2008; M. A. Davis, 2009). Previous studies reveal that positive mood informs the individual that s/he is in a safe and satisfactory situation where s/he may resort to loose and heuristic processing with broadened attention (Forgas, 1995). Positive mood motivates people to approach difficult tasks and encourages them to explore flexible, inclusive, and novel processes (Fiedler, 1988, 2000). For example, happy-induced undergraduate participants show much broader and inclusive cognitive categories compared with the control group (Isen & Daubman, 1984). Previous studies have also shown that positive affect promotes unusual construct associations, thereby leading to high cognitive flexibility and low perseverance (Baas et al., 2008).

By contrast, negative mood signals that the focal person is in an undesirable situation, thereby reducing his/her attentional focus and motivating him/her to stick to established strategies. Some studies reveal that negative mood negatively influences creativity (Baumann & Kuhl, 2002; Vosburg, 1998). For example, in an experimental study with a high-level intuition task, those participants that experience the negative affect show reduced access to extended semantic networks, thereby impeding their creative performance (Baumann & Kuhl, 2002). However, findings of previous research are controversial in that some researchers argue that negative and neutral moods show no differences in relation to creativity (Göritz & Moser, 2003; Verhaeghen, Joormann, & Khan,

2005). Moreover, other studies reveal that negative mood states, which lead people to utilize strict, systematic, and detailed information processing and drives their tendency to process concrete external information, promote creative performance (Carlsson, Wendt, & Risberg, 2000; Clapham, 2001; George & Zhou, 2002, 2007; Kaufmann, 2003). For instance, when clear information is provided (which indicates the appropriateness of modifying the current strategy), individuals in a sad mood are more ready to change their strategies compared with those in a happy mood (Gasper, 2003). With these mixed results, some studies even assert that negative mood does not affect creativity (Grawitch, Munz, Elliott, & Mathis, 2003).

However, although positive moods are generally accepted to be associated with creativity, the empirical results vary depending on the activation level. For example, while a high-activated positive mood plays a critical role in inducing innovative behavior (Madrid, Patterson, Birdi, Leiva, & Kausel, 2014), some positive yet deactivating moods, such as relaxation and serenity, do not agree with this result (Baas et al., 2008). Moreover, people in a negative and deactivating mood, such as sadness or depression, demonstrate a weakened engagement with the environment, thereby reducing their creativity (Baas et al., 2008; Henriques, Glowacki, & Davidson, 1994), while activated negative affects increase cognitive persistence and perseverance (Brehm, 1999; Carver, 2004), foster the generation of original solutions and realization of new ideas (Montani, Dagenais-Desmarais, Giorgi, & Grégoire, 2018), and sometimes help engender changes and therefore stimulate creativity (Frijda, 1988; George & Zhou, 2002; L. L. Martin & Stoner, 1996). Such inconsistency clearly shows that a hedonic tone does not explain creativity alone and that the interaction of a hedonic tone with activation must be considered (Baas et al., 2008; Montani et al., 2018). Therefore, an alternative explanation for the mood-creativity link through the interactive role of hedonic tone and activation

must be proposed (De Dreu et al., 2008).

1.5. Dual Pathway to Creativity

The model of dual pathway to creativity has been proposed to explain the mixed effects of positive and negative moods on creative performance. This model identifies cognitive flexibility and cognitive persistence as two possible ways to achieve creativity (De Dreu et al., 2008).

Flexibility, which has been previously reported as a component of creativity, is also an important cognitive process toward creative outcomes (De Dreu et al., 2008). People can achieve creativity through unusual and distant associations made from flat associative hierarchies (e.g., Eysenck, 1993; Mednick, 1962), set-breaking (e.g., Duncker, 1945; S. M. Smith & Blankenship, 1991; S. M. Smith, Ward, & Schumacher, 1993), and cognitive restructuring (or flexible thinking). Apart from being a measure of creativity, cognitive flexibility can be a precursor of the fluency of unique ideas. Therefore, cognitive flexibility is one of the dual pathways to creativity (De Dreu et al., 2008).

Creativity often requires employees with a high level of effort and persistence (e.g., Staw, 1995). Although they may lack diverse categories and broad perspectives, being persistent and hardworking entail the generation of many ideas. The fluent development of ideas within a few categories will, after all the conventional and typical ideas have been suggested, produce a plethora of original ideas. Therefore, cognitive persistence is another pathway to creativity suggested in the dual pathway model.

Taken together, creativity can be achieved by flexibly switching among broad and inclusive cognitive categories and perspectives and by using remote associations, which in turn enhances one's cognitive flexibility to achieve creative insights and ideas. At the same time, creative ideas, insights, and solutions can be achieved through persistence and perseverance, which can be manifested as engaging in hard work and devoting much time

and effort in a systematic and structured in-depth exploration of a relatively small number of cognitive categories.

To further elaborate the mixed relationship between mood and creativity, the dual pathway model adopts the activation of mood state, which fosters creativity in many disciplines (e.g., Dietrich, 2004; Dreisbach et al., 2005). Through the release of organic chemicals such as dopamine and noradrenaline, activation or arousal is associated with an improved working memory capacity, which subsequently affects a series of work-related performances (De Dreu et al., 2008, p. 741). A high level of working memory capacity corresponds to a greater ability to stay focused on the problem and maintain a large number of items as active as they rely on one's attentive ability to utilize information (Engle, 2002). Through the improvement of working memory capacity, activated mood state is related to a highly flexible, strategic, abstract, and fast process, which in turn results in increased creativity (George & Zhou, 2007).

The hedonic tone of activated mood states is related to one of the aforementioned dual pathways. When activated, positive affect promotes cognitive flexibility by promoting uncommon perspectives, inclusive thinking, and frequent switches among several categories; by contrast, when activated, negative affect is related to less attention shifting, less flexibility, and a detail-oriented systematic and analytical thinking. Therefore, the activated negative affect is related to cognitive persistence.

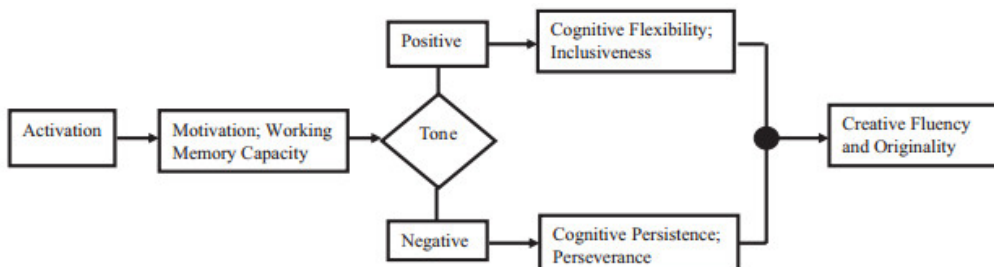


Figure 2 Dual pathway model (De Dreu, Baas, & Nijstad, 2008, printed with permission)

In sum, activating positive emotion enhances creativity by stimulating flexibility, while activating negative emotional state promotes creativity by stimulating persistence (Baas et al., 2008; De Dreu et al., 2008; Nijstad, De Dreu, Rietzschel, & Baas, 2010). Individuals in a positive and activated emotional state (e.g., happy and elated) show an increased cognitive flexibility, which in turn promotes their fluency and originality, while people in a positive yet deactivating emotional state (e.g., relaxed) show little creativity (De Dreu et al., 2008). In addition, those people in negative and activated emotional states (e.g., afraid and anxious) show improved fluency and originality through persistence, while those who are in negative and deactivated emotional states (e.g., sad) show little creativity (Baas et al., 2008). In the case of negative emotions, an increase in cognitive persistence and perseverance, instead of flexibility, promotes creativity (Baas et al., 2008; De Dreu et al., 2008).

2. Review of Social Comparison Theory

2.1. Definition of Social Comparison

Social comparison is a major concern in human life. Festinger (1954) introduced social comparison theory as an extension of earlier informal social communication theories (Festinger, 1950). In his informal social communication theory, Festinger (1950) argued that people tend to communicate their opinions with group members because there are pressures towards conformity of opinions among a group. By using nine hypotheses and eight corollaries, Festinger developed his theory into social comparison theory (Festinger, 1954), which formed the basis for succeeding comparison studies. Social comparison (Festinger, 1954) has been defined as the “process of thinking about information about one or more other people in relation to the self” (Wood, 1996). Originally, this theory is used to explain the social process among individuals who use similar others to meet their needs

to evaluate their own abilities and opinions, thereby generating pressures toward uniformity. When evaluating one's opinion or abilities via objective, non-social means is not feasible, people often compare themselves with similar others to fulfill their needs of self-evaluation (S. E. Taylor, Buunk, & Aspinwall, 1990). In later studies, the definition of social comparison has been expanded to "any process that individuals relate their own characteristics to those of others" (Buunk & Gibbons, 2000, p. 491).

2.2. Upward and Downward Comparison

Concerning the comparison of abilities, Festinger (1954) proposed a distinctive feature. Social comparison theory suggests a "*unidirectional drive upward*," which suggests that people strive to improve their performance and want to be more capable than the persons with whom they are comparing themselves (Festinger, 1954). This struggle for self-improvement can be achieved by comparing oneself with better people and identify areas of improvement.

Although Festinger initially proposed the *similarity hypothesis*, which posits that individuals seek similar others to compare themselves with because they are the best source of self-evaluation (Festinger, 1954; J. Suls & Wheeler, 2000), his subsequent emphasis on other motivations of comparison, such as self-improvement and self-enhancement, has shifted the focus of comparison to upward and downward comparisons.

The initial experiment of Hakmiller (1966) and the rank-order paradigm and integrative research of Wills (1981, downward comparison theory) shifted the research interest from self-assessment to self-enhancement. Wills (1986) argued that when facing threats, downward comparisons generate a positive affect that is essential for self-enhancement. For the purpose of self-enhancement, performing a *downward comparison* to someone worse off than oneself presents an effective way for one to protect his/her self-esteem. Threatened individuals who need self-enhancement can benefit from downward

comparisons to improve their subjective well-being and self-esteem, reduce their anxiety, and generate a positive affect (Crocker & Gallo, 1985; Gibbons, 1986; Hakmiller, 1966; Morse & Gergen, 1970; Wills, 1981).

By contrast, an *upward comparison* to someone better off than oneself is assumed to negatively affect subjective well-being because such comparison diminishes one's self-esteem and generates a negative affect (Buunk & Gibbons, 2000; Wood, 1989). People frequently express anger and resentment when they discover that similar others are better off than themselves. For instance, exposure to thin and idealized body images can increase one's negative mood and body dissatisfaction (Tiggemann & McGill, 2004). Some researchers found that people avoid upward comparisons after encountering failure (Marsh & Parker, 1984; Marsh, Trautwein, Lüdtke, & Köller, 2008) and that upward comparisons in terms of ability is associated with negative mood (Gibbons & Gerrard, 1989) can lead to negative affect (Gibbons & Gerrard, 1989; Nadler & Fisher, 1986) and jealousy (Salovey & Rodin, 1984).

However, the subsequent research has challenged this prototypical view, that is, downward comparison does not always result in positive feelings. For example, those individuals with chronic illnesses feel threatened when they compare themselves with patients who are facing more serious illnesses (Wood et al., 1985). Taylor and Lobel (1989) argued that individuals may benefit from both upward and downward comparisons when they feel threatened. Specifically, they suggested that individuals enhance self-esteem from downward comparison and gain inspiration and information through upward comparison. Moreover, although the negative effects of upward comparison have been frequently reported, recent studies have predicted positive shifts after comparing oneself with superior others (R. L. Collins, 1996; Mussweiler & Strack, 2000). Thin body images presented in the media may inspire individuals when they have strengthened thinness attainability

beliefs, thereby shifting their self-perception toward a positive direction (Mills, Polivy, Herman, & Tiggemann, 2002; Yu, Damhorst, & Russell, 2011). In line with this, Buunk et al. (1990) proposed that both upward and downward comparisons can be self-enhancing and suggested that whether individuals feel positive or negative after a comparison depends on dispositional and situational factors.

2.3. Affective Consequences of Social Comparison

Buunk et al. (1990) demonstrated that upward and downward comparisons may have both positive and negative effects and asserted that “affective consequences of a comparison are not intrinsic to its direction” (Buunk, Collins, Taylor, VanYperen, & Dakof, 1990, p. 1239). Facing someone who is better off than oneself delivers two pieces of information, namely, (a) that one is not as well-off as the other people and (b) that one can improve himself/herself as a comparison target. Those people who focus on the fact that they can improve themselves feel positive after the comparison, while those who focus on the negative side feel worse after the comparison. Conversely, knowing that other people are worse off than oneself presents two possible stories, that is, (a) that one’s standing is better than that of other people and (b) that one’s status may grow worse. An individual who focuses on the bright side feel positively about his/her current status, while someone who focuses on the negative side will feel worse. Therefore, the affective responses to upward or downward comparison depends on how the information is construed and not on the direction of comparison (Burlison, Leach, & Harrington, 2005; Morry & Sucharyna, 2016).

The affective consequences of social comparison have recently attracted much research interest along with the mechanism for each affective reaction (e.g., Buunk et al., 1990; Smith, 2000). Smith (2000) presented a theoretical typology for classifying affective reactions to social comparisons depending on several dimensions, including the (a)

direction of comparison (whether the comparison is upward or downward), (b) the desirability of the self and the other (whether the comparison result is desirable or undesirable), (c) the focus of attention (including self, other, and dual focus), and (d) the contrastive versus assimilative nature of the reaction (which is largely determined by perceived control) (Richard H. Smith, 2000). Consistent with Smith, Buunk et al. (2005) proposed three dimensions that underlie affective reactions to social comparison, namely, (a) the direction of comparison (i.e., upward or downward), (b) the contrast versus identification nature of reaction, and (c) the focus of attention (only self and others) (Buunk, Kuyper, & van der Zee, 2005). According to these studies, the affective reactions to social comparison can be explained by the comparison types presented above. For example, a student who is manipulated to perform an upward comparison demonstrates hope most frequently if s/he identifies with the comparison target (Buunk, Kuyper, et al., 2005). Bunker et al. (2005) and Smith (2000) have generated 15 and 8 types of discrete emotions, respectively (Figure 3).

Although the results of these two studies coincide in a few categories (i.e., resentment, worry, and contempt), they adopted different discrete emotions for analyzing the other categories. Smith (2000) mentioned that although he focused on emotions that are “considered to be the most obvious cases of social comparison-based emotions,” a deeper investigation into the other emotions is needed because “other candidate emotions may fit better” (Smith, 2000, p. 195). Buunk et al. (2005) argued that some discrepancies in their findings may be merely semantic (hope vs. optimism; compassion vs. pity) while the other differences may be more substantive. They also called for a further investigation into the social comparison mechanism of affective reaction and a broader coverage of the other emotional reactions (Buunk et al., 2005, p. 236).

Comparison type	Buunk et al. (2005)	Smith (2000)
<i>Upward identification</i>		
Self-focus	Hope	Optimism
Other-focus	Sympathetic enjoyment	Admiration
Dual-focus	N/A	Inspiration
<i>Upward Contrast</i>		
Self-focus	Frustration	Depression/shame
Other-focus	Resentment	Resentment
Dual-focus	N/A	Envy
<i>Downward identification</i>		
Self-focus	Worry	Fear/Worry
Other-focus	Compassion	Pity
Dual-focus	N/A	Sympathy
<i>Downward Contrast</i>		
Self-focus	Relief	Pride
Other-focus	Contempt	Contempt/scorn
Dual-focus	N/A	Schadenfreude

Figure 3 Affective responses to social comparison, adapted from Buunk et al. (2005)

The mixed use of discrete emotions impedes a thorough understanding of affective reactions to social comparison as these emotions sometimes create confusion between terms and provide only a partial understanding of the emotional span. Although both of these authors, who opened the door for researchers to understand the affective consequences of the social comparison process, have emphasized the need to investigate a broader array of emotions, very few studies have attempted to understand emotional reactions as a whole. Therefore, the call for examining a wider variety of emotions remains unanswered.

2.4. Focus on Upward Comparison

Upward and downward social comparisons have desirable and undesirable effects for employees. In general, people choose to engage in upward comparison even when their self-esteem is threatened. A recent meta-analysis reveals that selection studies “showed a

strong preference... for upward choices when there was no threat; there was no evidence for downward comparison... even when threatened” (Gerber, Wheeler, & Suls, 2018, p. 177, ellipses added). In terms of abilities, people tend to compare themselves with slightly better others as implied in the “unidirectional drive upward” concept (Festinger, 1954) because they strive to improve themselves and be more capable than those persons with whom they are comparing themselves (Taylor et al., 1990, p. 75). In organizations where promotion and reward are determined by comparing the abilities of coworkers, employees tend to focus on superior others and aim to improve themselves instead of seeking for psychological comfort by comparing themselves with inferior coworkers.

In contemporary organizations, managers tend to form teams that comprise experienced and capable employees (Fleming & Monda-Amaya, 2001). However, such setup only creates a situation where employees are frequently compared with excellent coworkers. Although an upward comparison may produce a short-term negative effect, such as a negative affect (e.g. Nadler & Fisher, 1986), organizational teams filled with capable and confident employees, which may frequently induce upward comparison, are usually expected to produce fruitful results.

An upward comparison may benefit organizations in several ways. For instance, upward comparison provides useful information about self-improvement (Buunk & Ybema, 1997) by allowing individuals to observe excelling others, which in turn will motivate them to improve themselves. Viewing the others’ success may also encourage people to believe that they can achieve the same degree of success, thereby motivating them to exert additional effort in their tasks to achieve their goals. For example, by observing the superior performance of a coworker, an employee may sense his/her own potential and set higher goals to achieve superiority (Buunk, Collins, Taylor, VanYperen, et al., 1990; Lockwood & Kunda, 1997; Major, Testa, & Bylsma, 1991; Wheeler, Martin,

& Suls, 1997). People may also identify themselves with superior others, such as leaders, try to mimic their behavior (Bandura, 1986; Greenberg et al., 2007), set personal goals that are as high as those of better performers, and exert additional effort in their tasks to achieve such goals (Seta, 1982).

Despite serving as a source of self-confidence and other positive outcomes, upward comparison can also be a source of stress and low self-esteem. Instead of gaining confidence in their potential, employees may be discouraged by the differences in their achievements. For example, those successful students who have no choice but to perform downward comparisons with regular students may engage in unfavorable upward social comparisons after moving to an advanced program, thereby leading to negative effects (Marsh, Köller, & Baumert, 2001). Discouragement and stress are among the overriding drivers of low performance. Therefore, it is important in effective team functioning for managers to understand the process through which upward comparison may have positive or negative affective reactions, and induce their employees to show positive reactions. Moreover, managers must care for those employees who face stress after an upward comparison instead of those employees who become more confident and happier after a downward comparison. Therefore, the concerns relating to upward comparison warrants a thorough examination.

2.5. Discrete Emotion to Emotion Circumplex Model

Emotional phenomena are very diverse and complex that they cannot be easily captured in a single model or theory. The definition and classification of emotional states have been examined in many studies. In this dissertation, I briefly review two emotion approaches, namely, the discrete emotion approach and the dimensional approach, and discuss the recent theoretical developments across different disciplines in support of the dimensional approach.

2.5.1. Discrete Emotions

Two major approaches have been developed for classifying emotional states. The first of these approaches is the categorical or the *discrete emotion* approach, which posits that only a limited number of distinct emotions are universal and innate (Izard, 1992, 1994). Each discrete emotion has distinctive characteristics, goals, and action tendencies (Roseman, Wiest, & Swartz, 1994). Two groups of researchers have used this approach to determine basic emotions. Basic emotion theorists claim that some basic emotions are “evolutionary determined” (Izard, 1992; Plutchik, 1984), whereas modern cognitive theorists posit that some “modal emotions” are not necessarily evolutionary determined but are most salient in contemporary people’s lives (Scherer, 1994).

The discrete emotion model has been widely used in previous social comparison research, whereas the most widely known and accepted discrete emotions are taken from the *differential emotions theory* of Izard (DET, Izard, 1977), who identified 10 emotions based on facial expressions (i.e., anger, disgust, contempt, interest, joy, surprise, sadness, fear, shyness, and guilt). DET defines emotions as “feeling state or motivational condition” that are “direct and immediate products of neural processes associated with that emotion” (Izard, 1992, p. 561). Izard claimed that emotions can be distinguished by facial expressions and proposed some basic emotions based on the facial expressions of participants. The emotions identified by DET can be measured by using the *differential emotions scale* developed by Izard (1977, p. 126).

Ekman (1992) identified six basic types of emotions with unique facial expressions, physiology, and triggering events. Specifically, he proposed happiness, surprise, sadness, anger, disgust, and fear as distinguishable emotions that are represented as scales in the facial action coding system (Ekman & Friesen, 1976, 1978), which “can be used to describe any facial movement” in images or videos (Ekman & Friesen, 1976, p. 56). To

proficiently observe anatomy-based action units and determine emotions, one must engage in a 40-hour training or self-instruction (Ekman & Friesen, 1976).

2.5.2. Dimensional Approach

The dimensional or “emotion circumplex” approach posits two or more bipolar dimensions on a circumplex that can be applied to describe any emotional state. All emotions can be represented as a point on an n-dimensional space described in each theory.

The dimensional approach was first introduced by Wundt (1896), who provided a structural description of subjective feelings in three dimensions (pleasure, tension and inhibition). After Wundt (1896) pioneered the dimensional approach to the emotional states, various researchers proposed circumplex models.

Russell’s (1980) circumplex model of affect is one of the most popular and widely used models for capturing emotions. According to this model, affect can be described on a bipolar dimension with two axes, namely, pleasure versus misery and arousal versus sleep. Between the axis of valence and arousal, emotions such as excitement, relaxation, depression, and distress are located in a circle.

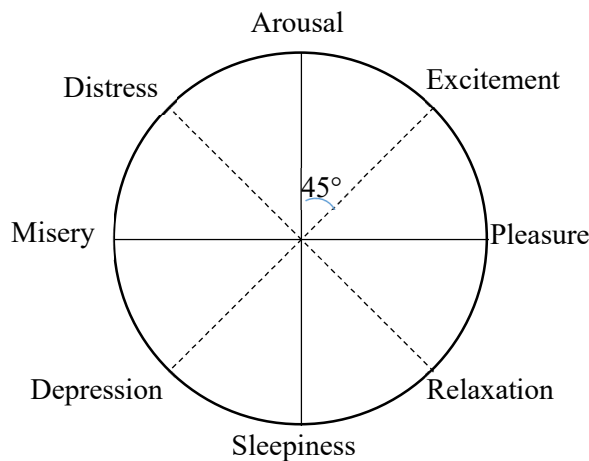


Figure 4 Russell’s circumplex model of affect, adapted from Russell (1980)

Larsen and Diener (1992) proposed a dimensional model with the bipolar dimensions of activation and pleasantness. Between the high versus low activation axis and the pleasant versus unpleasant axis, moods are divided into activated pleasant, unactivated pleasant, unactivated unpleasant, and activated unpleasant.

Watson and Tellegen's (1985) positive and negative affect schedule (PANAS) adopts two distinct unipolar scales, namely, the positive affect and negative affect, and combined arousal and hedonic tone in each axis. Highly positive affect refers to highly positive emotional states with high arousal, whereas highly negative affect refers to negative emotional states with high arousal. According to the PANAS model, positive and negative affects are two orthogonal unipolar dimensions and not the two ends of a bipolar dimension.

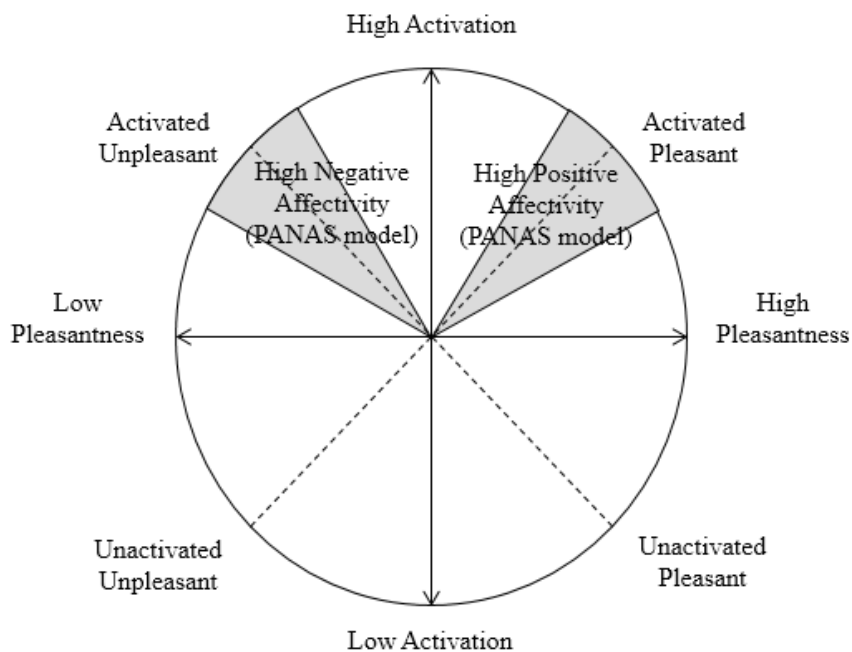


Figure 5 Circumplex model of affect (Larsen & Diener 1992) combined with the PANAS model (Watson & Tellegen 1985)

Thayer (1989) developed a circumplex model by splitting activation into energetic arousal and tense arousal. One axis of this model represents energy and tiredness, while

the other axis represents tension and calmness. According to Thayer (1989), these two arousal axes are psychologically and physiologically distinct. For example, a person can feel high tension and low energetic arousal when s/he is about to hear the final sentence from a judge. By contrast, a person may feel high energetic arousal with low tense arousal when s/he is planning for a one-month vacation around Europe.

By adopting the notion that emotions are determined by appraisal, Scherer (2005) provided an alternative dimensional model of emotions with the two major appraisal dimensions of goal conduciveness and coping potential. In his emotion circumplex that includes the axes of valence and arousal, Russell (1983) superimposed a 2D structure with goal conduciveness (conductive/obstructive) and coping potential (control/power) with a 45° rotation. These dimensions are shown in Figure 6 along with some terms of emotions mapped on the circumplexes developed by Russell (1983) and Schere (2005).

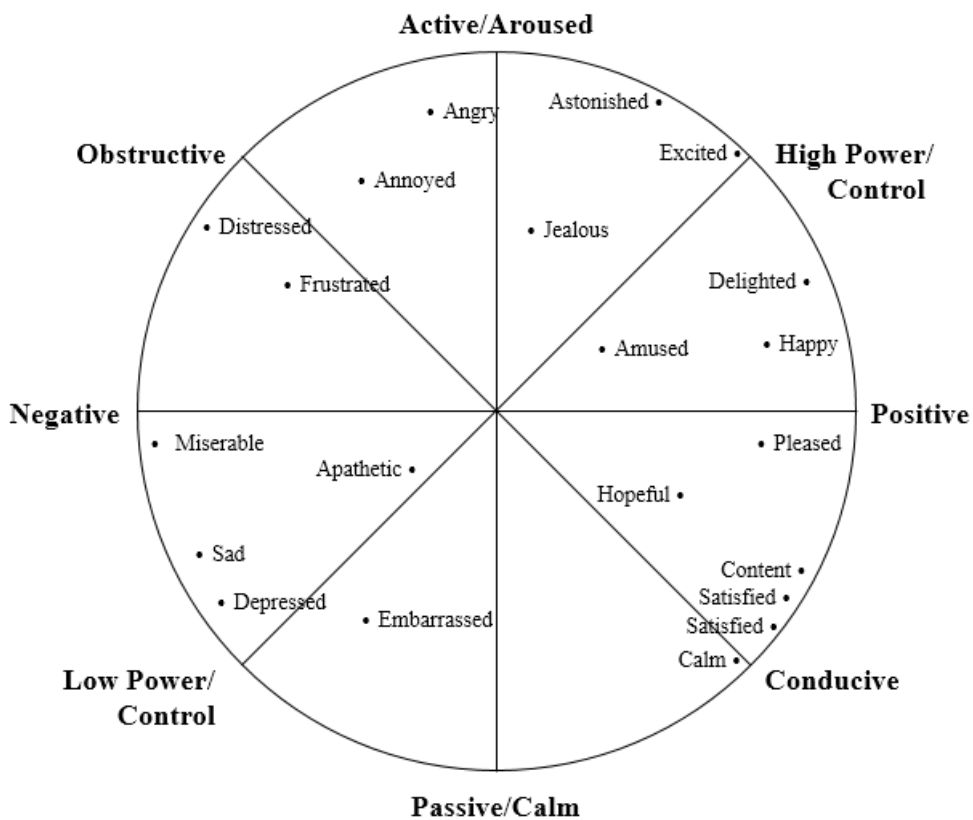


Figure 6 Alternative dimensional structure of emotions, adapted from Scherer (2005)

2.5.3. Discrete Emotion to Dimensional Approach

Following the abundance of related theories and models, a growing amount of evidence highlights the dimensional approach as the most suitable method for describing the affective state. Previous studies on the core affect and psychological construction of emotions have also identified the dimensional approach as the most suitable approach for describing core affect (Russell, 2003). In their meta-analysis of mood–creativity research, Baas et al. (2008) asserted that emotions can best be described by the 2D model and that “growing evidence from research on self-reported mood and neurophysiological research suggests that the affective space can be parsed using pleasure on the one hand and activation on the other” (Baas et al., 2008, p. 782).

Studies in the neurophysiological discipline have called for researchers to use the circumplex model of emotion with valence and arousal on its axes. They suggest that all affective states can be understood as cognitive interpretations of core neural sensations in the brain that are determined by independent neurophysiological systems (Posner, Russell, & Peterson, 2005). They also propose a circumplex model that opposes the previous theories of basic emotions and suggest that each emotion is determined by a discrete and independent neural system. They argue that “basic emotion theories no longer explain adequately the vast number of empirical observations from studies in affective neuroscience” and that “a conceptual shift is needed in the empirical approaches taken to the study of emotion” (Posner et al., 2005, p. 715).

Following this argument, an experimental study reveals that affective states emerge from the interpretations of the two dimensions of arousal and valence. In their experiment, Gerber A. J. et al. (2008) presented their participants with pictures of human faces. After each picture disappeared from their view, the participants were asked to indicate on a 2D grid the point that best describes the feeling expressed in the picture they have seen. In this

grid, the x-axis indicates valence, while the y-axis indicates arousal. By analyzing scanned brain images, Gerber A.J. et al. (2008) found that distinct neural systems subserve the two dimensions of affect–arousal and valence.

In music psychology, a comparative study of the discrete and dimensional model of emotions in music reveals that the 2D model can best explain the perceived emotions in music (Eerola & Vuoskoski, 2011). In this study, 116 non-musicians were asked to rate 110 music excerpts, with each excerpt representing 5 discrete emotions (i.e., anger, fear, sadness, happiness, and tenderness) and 6 extremes of 3 bipolar dimensions (i.e., valence, energy arousal, tension arousal). Perceived emotions can best be represented in a 2D model with the two central dimensions of valence and arousal. A comparison of the discrete, 2D, and 3D models of emotions reveals that while the dimensional model can offer a better explanation of emotions, the 3D model can be reduced to the 2D model without significantly damaging the goodness of fit. The experiment results indicate that the discrete emotion model demonstrates poor resolution in characterizing ambiguous emotions.

As can be seen from the comparable studies of Buunk et al. (2005) and Smith (2000), using discrete emotion restrains the understanding of emotions in specific contexts, because this approach considers emotions in the same dimension as different constructs. For example, for the upward comparison–identification situation focused on the self, Buunk et al. (2005) identified “hope” as a resulting emotion, whereas Smith (2000) identified “optimism” as the resulting affective state. Moreover, the affective reactions to an external situation can better be depicted as a certain area rather than a single point on a directional map (Han & Cha, 2017). In this case, emotions can be more reasonably presented on a circumplex than by using preset discrete emotion terms.

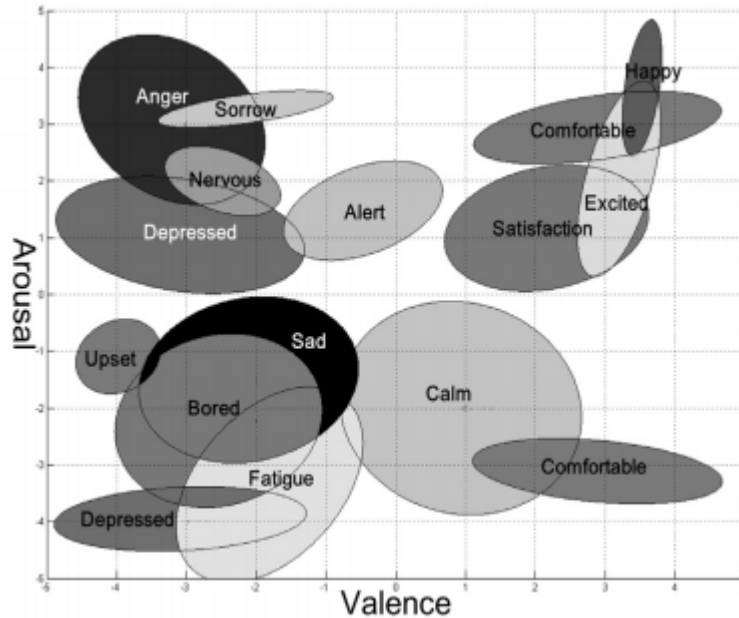


Figure 7 Emotional region (Han & Cha 2017, printed with permission)

Following the recent findings and arguments, studies on social comparison and creativity, which have conventionally focused on discrete emotions or positive/negative affectivity, must move away from the basic emotion model of affective state, which considers that all emotions are derived from a limited number of universal and basic emotions (e.g., anger, fear, disgust, sadness, and happiness; Ekman, 1992, 1999), to a dimensional model of emotions.

2.6. Possible Determinants of the Affective Consequences of Social Comparison

According to Buunk et al. (1990, p. 1239), the affective consequences of social comparison are not intrinsic to their direction. How one feels about the comparison depends on how s/he construes the information obtained from the comparison results. The affective implications of upward and downward comparison can be influenced by various moderating factors, and numerous studies have proposed potential moderators (Buunk, Collins, Taylor, VanYperen, et al., 1990).

According to the transactional model of stress, the reactions of individuals to stressful events are determined by their appraisal of (a) the threat imposed by an event (primary appraisal) and (b) their ability to cope with the event (secondary appraisal) (Lazarus & Folkman, 1984). Researchers have attempted to interpret the reactions of individuals to social comparison based on this framework.

Lazarus and Folkman (1984) defined stress as the imbalance between an individual and his/her environment; the stressors produced by the environment result in perceived demands, and the ability of individuals to cope with stressors responds to such demands. When the perceived demands from the environment are strengthened, people become aroused and prepare themselves to meet the external requirements. When their perceived ability to cope with the demand is high enough to respond to the requirements, then people will develop positive expectations about their achievements.

The relevance of the comparison dimension is among the earliest suggested moderators of the affective consequences of social comparison (Tesser, 1986; Tesser & Collins, 1988) given that such relevance is an important criterion for determining whether the comparison result is threatening or not (Major et al., 1991). Early studies suggest that an upward comparison on a relevant dimension may decrease an individual's self-evaluation, thereby producing a negative affect. Relevance was usually studied as a potential moderator with closeness or similarity with a comparison other in a number of studies (Major et al., 1991; Nadler, Fisher, & Itzhak, 1983; Salovey & Rodin, 1984; Tesser, Millar, & Moore, 1988), but perceived similarity has been identified as a moderator that does "not necessarily mean that a social comparison will have psychological impact" (Major et al., 1991, p. 244).

Perceived control over the outcome can also influence the effects of social comparison through a secondary appraisal process in which people determine their ability to cope with

the threat from the comparison result (Major et al., 1991). The effects of implied social comparison, such as relative deprivation or inequity, is also influenced by the perceived control of individuals (Crosby, 1976; Singer, 1981). Both the perceived control over comparison discrepancies and the attainability of a comparable other's superiority have been identified as influential factors in many empirical studies (e.g., Argo, White, & Dahl, 2006; Lockwood & Kunda, 1997; Nadler & Fisher, 1986; Stewart, Chipperfield, Ruthig, & Heckhausen, 2013).

2.6.1. Relevance of the Comparison Dimension

According to the transactional model of stress (Lazarus & Folkman, 1984), the individuals' responses to stressful situations differ depending on their appraisal. By using the coping framework, Major, Testa, and Bylsma (1991) proposed that the esteem-relevance of the social comparison domain influences the primary appraisal of the comparison situation as either threatening or not. They added that an upward comparison with a similar other on a self-relevant dimension is the most esteem-threatening, although perceived similarity can be distorted to protect self-esteem.

In a similar vein, Tesser, Millar, and Moore (1988) evaluated computer-administered tasks as either highly or lowly relevant to undergraduate students who were recruited as pairs of friends. When a close friend outperforms the other in a high-relevance task, the self-esteem of students is threatened, thereby resulting in negative emotions. By contrast, when a close friend outperforms the other in a low-relevance task, the students do not feel any threat from the upward comparison and instead feel a positive affect at the success of their close friends. Salovey and Rodin (1984) performed an experiment where undergraduate students are given feedback on a bogus test. In their upward comparison with close others on a high self-relevance task, the participants showed more negative moods compared with those in other situations.

When the participants received help from close others on self-relevant tasks (which creates an implied upward situation), they felt threatened and showed a negative affect (Nadler, Fisher & Ben-Itzhak, 1983). These participants considered such act as an aversive and self-threatening experience and demonstrated the least favorable affect and self-evaluation. By contrast, those who received help twice from a good friend on an ego-irrelevant task perceived such act as a positive and supportive experience and demonstrated the most favorable affect and self-evaluation. When competing with others, the implied self-relevant aspect of the competing situation, despite being virtual in nature, only make those people who are facing an upward comparison feel more threatened (Brickman & Bulman, 1977; Mettee & Smith, 1977).

In their national longitudinal study on the thoughts and lives of students, Shernoff et al. (2014) measured instructional relevance in relation to student engagement, attention, and quality of experience. High school students reported higher engagement in relevant activities yet showed a poor quality of experience in these activities. These students also enjoyed art class (the subject with the least relevance) the most and felt negatively about math (the subject with the highest relevance).

Generally, self-evaluation faces more threats when individuals are outperformed in a high self-relevance domain than in a low self-relevance domain (e.g., Morf & Rhodewalt, 1993; Tesser et al., 1988). Some studies reveal that the combination of closeness and self-relevance poses the greatest threat to self-esteem, thereby generating strong negative reactions (e.g., Nadler et al., 1983; Salovey & Rodin, 1984; Tesser, 1988; Tesser & Collins, 1988; Tesser et al., 1988), but it is self-relevance that has psychological impact rather than closeness (Major et al., 1991, p.244).

Previous studies, most of which were experimented with students (e.g., Shernoff, Csikzentmihalyi, Schneider, & Steele Shernoff, 2014; Tesser, 1988; Tesser & Collins, 1988;

Tesser et al., 1988), suggest that an upward comparison in an esteem-relevant domain leads to a negative affect while an upward comparison in an irrelevant domain leads to a positive affect from “reflected glory.” Although individuals may bask in a reflected glory resulting from the excellent performance of their close friends (Tesser et al., 1988) or the positive image of their organizations (Dutton, Dukerich, & Harquail, 1994), basking in glory is highly unlikely in certain circumstances. For example, an organizational employee may not feel any pleasant emotions from the excellent performance of his/her team members. In organizational teams, members compete with one another (Fletcher, Major, & Davis, 2008) and their reward and career success is determined by their own performance relative to others. In a similar vein, upward comparison in a relevant domain does not always lead to negative responses. When the superior performance of a comparable other in an esteem-relevant domain seems attainable, the consequences may be inspiring and positive instead of negative and demoralizing. Lockwood and Kunda (1997) argued that knowing of a superstar in a relevant domain may have a positive effect. Although Tesser’s (1988) self-evaluation maintenance model asserts that superstars in a relevant domain are supposed to evoke negative feelings, the attainable success of a superstar provokes self-enhancement and inspiration (Lockwood & Kunda, 1997). Therefore, to fully understand the affective responses to upward comparison, the attainability of the comparison dimension must be considered along with domain relevance.

2.6.2. Perceived Attainability

Following Festinger (1954), many social comparison studies have investigated whom people select as comparison others under certain circumstances. Tesser (1988) proposed the self-evaluation maintenance model, which focuses on those processes through which people maintain positive self-evaluations when facing a potentially threatening comparison situation. According to this model, those individuals who are facing close

others that demonstrate excellent performance in an important dimension will face a reduced self-evaluation and demonstrate negative reactions. Upward comparison, which is especially threatening to self-esteem, may result in negative reactions (Mussweiler, Gabriel, & Bodenhausen, 2000; Salovey & Rodin, 1984).

However, other studies reveal that different reactions are expected when the focal person believes that s/he can reach the same excellence of a comparable other. People's perceptions about their ability to cope with a certain situation can distort their appraisals over the comparison situation (Lazarus & Folkman, 1984) and alter their reactions toward such situation (Major et al., 1991). If one believes that s/he can achieve a better outcome or performance compared with another, then the success of others will provide him/her (a) a positive signal that s/he can improve himself/herself, (b) relevant information on how much s/he can achieve, and (c) a guideline on how to succeed. Therefore, the affective responses of individuals in an upward comparison situation depend on how they interpret the comparison results. To explain the effects of an individual's belief in whether or not s/he can achieve the same success of the comparison target, several factors have been introduced in the literature, including perceived control over comparison discrepancy (Major et al., 1991) and attainability (Lockwood & Kunda, 1997).

Perceived control refers to "the extent to which one believes that subsequent outcomes are controllable and alterable" (Testa & Major, 1990, p. 206). Under an esteem-relevant upward comparison situation, one's perception of his/her controllability may alter his/her interpretations of the situation by influencing the secondary appraisal process, which evaluates and determines his/her reactions to the event (Lazarus & Folkman, 1984). For example, those situations where personal significance is high but perceived controllability is low are threatening to individuals, while those situations where significance and perceived controllability are both high tend to be appraised as a challenge (Folkman, 2013).

Therefore, perceived controllability reduces the level of self-threat induced from a social comparison and leads emotional reactions toward a positive direction. For example, when the advantages of a similar other in a self-relevant domain is noticed, controllability determines whether the affective reactions to such advantage is negative or positive (hostility) and whether the resulting emotion is benign or malicious (benign vs. malicious envy) (Hoogland, Thielke, & Smith, 2016).

When paired with an upward comparison situation in an esteem-relevant domain, a high perceived control over one's ability to change his/her relative standing can increase self-efficacy and motivation instead of promoting helplessness or anger (Major et al., 1991, p. 247). By contrast, if an individual feels that s/he can do nothing to change his/her situation, then s/he may induce feelings of universal helplessness accompanied by affective deficits (Abramson, Seligman, & Teasdale, 1978). Relevant upward comparisons that are perceived as unchangeable and attributed to the influence of external agents are especially likely to result in anger (Weiner, 1986).

In implied upward comparison situations, having a low perceived control can lead to negative emotional reactions (Bernstein & Crosby, 1980; Crosby, 1976; Nadler & Fisher, 1986). Crosby (1976) noted that in a relative deprivation situation, perceived control alters an individual's reactions to his/her situation. Under relative deprivation, those individuals with a high perceived control and open opportunities tend to focus on the positive aspect of their situation and engage in self-improvement. However, for those with low personal control, relative deprivation leads to emotional outburst regardless of the availability of opportunities (Bernstein & Crosby, 1980; Crosby, 1976). In an implied upward comparison situation where other people help the focal person, if the aid recipients expect to have control over the subsequent outcome, then a cluster of positive affects is produced in the long run. However, the low controllability perceived by the recipient can result in a series

of short-term negative affects, which are then followed by a long-term helplessness-like dependency (Nadler & Fisher, 1986).

Stewart et al. (2013) showed that individuals use downward comparison for one's own subjective well-being only when they perceive low controllability. With a high perceived control over the situation, these individuals feel less need to protect their subjective well-being by adopting secondary control strategies, such as downward comparison. Instead, they alter their perceptions and positively react to their situation (Stewart et al., 2013).

Perceived attainability refers to “the possibility of achieving the compared performance” (Argo et al., 2006). Similar to studies on perceived controllability, research on attainability depicts the positive consequences resulting from high attainability. Compared with superstars in a relevant dimension, if the star's success seems attainable, then individuals feel self-enhanced and inspired; otherwise, these individuals feel self-deflated. For instance, when accounting undergraduates read an article about an accountant with outstanding career achievements, those first-year students who perceive such success as attainable will feel positive about themselves and look up to the said accountant as a role model. By contrast, those fourth-year students who perceive such success as unattainable feel demoralized and deflated (Lockwood & Kunda, 1997). Mills et al. (2002) argued that by perceiving thinness as something attainable, dieters fantasize about being thin and become less upset when exposed to images of thin bodies. When consumers are exposed to upward social comparison information, the inclusion of perceived attainability creates a condition where consumers feel unthreatened and are less willing to lie in an effort to protect themselves (Argo et al., 2006).

Although studied under different names, both attainability and perceived control intend to examine the effects of an individual's belief that s/he can attain the same success achieved by comparable others. In this study, I use the term “perceived attainability” to

refer to an employee's perception that s/he can achieve a certain quality (i.e., creative ability) in his/her organizational context.

2.6.3. Social Comparison Orientation

“Social comparison is not equally important to everyone”(Van der Zee, Oldersma, Buunk, & Bos, 1998, p. 802). Some people tend to compare themselves with others frequently and react to the comparison information sensitively, while others are uninterested and insensitive to such information. The concept of social comparison orientation (SCO) has been introduced in the literature to investigate the dispositional differences in the tendency of individuals to engage in social comparison (Gibbons & Buunk, 1999; Van der Zee et al., 1998). SCO refers to “the personality disposition of individuals who are strongly oriented to social comparison, who are strongly interested in their own standing relative to others, and who are interested in information about others’ thoughts and behaviors in similar circumstances” (Van der Zee et al., 1998, p. 802).

In their experiment with cancer patients, Van der Zee et al. (1998) found that when provided with a computer program that enables them to access the interview data and medical information of other patients who were doing better or worse than themselves, certain groups of patients clearly spent more time reading the others’ experiences. Although patients with high neuroticism tend to prefer upward information, when they have high SCO, they read more interviews regardless of their direction. Patients with high SCO tend to engage in and respond to social comparison more frequently compared with those with low SCO (Van der Zee et al., 1998).

Depending on their level of SCO, some people spend more time engaging in comparisons, while other people refuse to engage in such activity. Some people sensitively notice others’ feelings and thoughts and are therefore greatly affected by them, while others are truly disinterested in what others think and feel (Buunk & Gibbons, 2007). Gibbons

and Buunk (1999) developed a scale to measure this “individual difference variable that is defined as the extent to which and the frequency with which people compare themselves with others” (Gibbons & Buunk, 1999).

Those people with high SCO are greatly affected by the results of social comparison. For example, when college students learn that drunk driving is common in their population, they tend to regard drunk driving as less dangerous and engage in such behavior. However, this relationship is significant only among students with high SCO (Gibbons, Lane, Gerrard, Pomery, & Lautrup, 2002). In an experiment among individuals who have been in relationships for a long time, Buunk et al. (2001) found that the effect of relational discontent on satisfaction is moderated by engagement in downward comparison. However, such effect was only observed among people with high SCO (Buunk, Oldersma & de Dreu, 2001).

Buunk (2005) exposed undergraduate students to two romantic relationship scenarios, namely, high commitment and high autonomy scenarios, and expected that male students prefer the autonomy scenario and show less negative affect while female students prefer the commitment scenario and show less negative affect. Their responses were expected to be significant only when these students have high SCO because they need to relate the scenario to themselves through the comparison process. As expected, the effects were only observed among students with high SCO (Buunk, 2005).

In the experiment, female participants were exposed to seven pictures of a woman’s face with different degrees of attractiveness. The level of attractiveness differentially predicted perceived dimensional closeness and psychological closeness. Among the participants, those with high SCO perceived dimensional closeness on psychical attractiveness (study1) and psychological closeness (study2) more strongly as the attractiveness of the target changes (Buunk, Dijkstra, Bosch, Dijkstra, & Barelds, 2012).

In Wehrens et al. (2010), SCO strengthened the relationship between social comparison and affective responses. Students were asked to complete a questionnaire that asked for their affective reactions toward certain comparison situations along with some measures of SCO. Among the three types of responses to social comparisons (i.e., empathic, constructive, and destructive responses), the male students scored higher on destructive responses while the female students scored higher on empathic responses. However, those students with high SCO scored higher on all three types of responses compared with those students with low SCO (Wehrens et al., 2010).

These studies clearly show that people with high SCO willingly compare themselves with others, experience more feelings and reactions from the comparison, and are highly affected by such activity. Given its possible association with various variables related to social comparison processes, SCO is a significant potential moderator for social comparison research (e.g., Buunk, Van der Zee, & VanYperen, 2001; Wang, Wang, Gaskin, & Hawk, 2017). To refine our understanding of how social comparison processes affect creativity, SCO will be controlled in this study.

3. Conclusions

Since the introduction of social comparison theory in 1954, numerous researchers have devoted much effort in understanding the causes and results of social comparison. However, most of these studies are laboratory studies instead of field studies performed in real organizations. Given their dependency on laboratory studies where participants, who are mostly undergraduate students, face a clear and concise comparison situation, the prevailing stream of literature provides a limited understanding of individuals in complex real-world situations, such as workplaces. In organizations, employees are always required to deliver a “better” performance compared with others for individual promotion, rewards,

or organizational success. To survive the competition, individuals are being pressured to meet the organizational standards and prove themselves. Given that upward comparison is a double-edged sword, understanding how employees construe and respond to a social comparison situation is necessary. Without comprehensively understanding this process, the prevailing upward comparison in teams may seriously demotivate employees, especially the low-performing ones, and eventually lead to organizational failure.

Given the growing importance of creativity and the lack of thorough recognition of the social aspects of individual creativity, an algorithm that explains the effects of social comparison on individual creativity must be developed. Such algorithm may provide new insights for organizational studies to verify the contingency factors that are found in laboratory studies, including relevance and perceived attainability, in field settings. The relevance of the comparison dimension is among the most important conditions of activated responses toward social comparison. In real-world contexts, employees that perform various jobs show different levels of creativity as required by their organizations. Therefore, the influence of the different requirements perceived by employees on their responses to an upward comparison situation needs to be examined. Perceived attainability determines whether an employee construes his/her discrepancy with a superior other as either achievable and inspiring or unattainable and demoralizing. The attainability of the ability gap in an organization largely depends on the environmental support provided by this organization. Therefore, the effect of supervisor support for creativity on employee creativity under an upward comparison situation warrants further study.

Although many theories and research on comparison motives have been conducted, the theoretical models that explain how social comparison is related to individual behavior, especially creativity, remain scarce (J. P. Gerber et al., 2018). Therefore, a psychological

process model that connects social comparison with individual creativity must be developed and empirically validated by using field data.

CHAPTER 3. THEORETICAL FRAMEWORK

This chapter introduces a process model that connects upward social comparison with creative outcomes in organizational settings. Based on the in-depth literature review presented in the previous chapter, I propose a conceptual model of social comparison process in teams while focusing on the effects of social comparison on creativity through affective and cognitive processes. Specifically, I propose that the effect of upward comparison on creative ability is related to individual creativity through affective reactions, which are presented as an emotion circumplex with valence and activation as two axes. I examine the moderating effects of teal-level factors that are expected to influence employees' interpretation of the comparison results. Each quadrant of the emotion circumplex, which comprises a combination of valence and activation, is related to creativity through the cognitive process including cognitive flexibility, cognitive persistence, and cognitive demotivation. Specifically, I propose that depending on the type of cognitive state, employees differentially show radical, incremental creativity and disengagement from creativity. Figure 8 presents the conceptual framework.

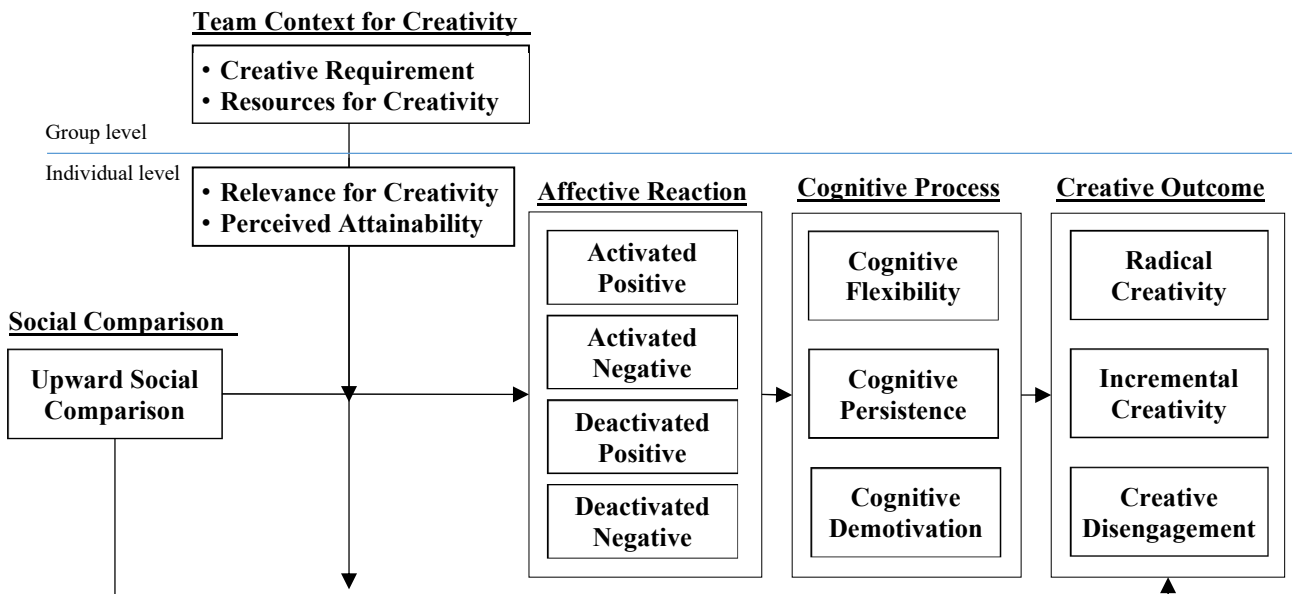


Figure 8 Conceptual framework

1. Introduction

Creativity has received much attention among researchers. In contemporary organizations that increasingly depend on team-based structure, the interpersonal dynamics between team members and the talents of each individual member play significant roles in promoting individual creativity. Given the popularity of team systems, scholars have begun to examine the importance of social processes in teams in developing individual creativity. Consequently, a growing body of research has focused on identifying which social dynamics may promote or inhibit creativity. For example, team learning behavior (Hirst, Van Knippenberg, & Zhou, 2009) and team bureaucracy (Hirst, Van Knippenberg, Chen, & Sacramento, 2011) interactively explain individual creativity along with individual goal orientation. Meanwhile, work team climate (Zhu, Gardner, & Chen, 2018) and work team diversity (Choi, 2007; S. J. Shin, Kim, Lee, & Bian, 2012) predict individual creativity. Based on social cognitive theory (Bandura, 1986), Zhou (2003) focused on the presence of creative coworkers who serve as role models. Clarifying the rather mixed results of previous studies on creative models, Zhou (2003) found that when employees perceive their coworkers to be creative, individual creativity is improved in the supportive context (i.e., low supervisor close monitoring and high supervisor developmental feedback). The positive effect of creative coworkers was especially significant among those employees with low creativity. Therefore, in team systems where members closely interact with one another, the presence of creative coworkers tends to cultivate individual creativity by comparing oneself with superior models.

Based on previous studies on the social cognitive aspects of team-based organization, I consider social comparison among team members as an influential predictor of individual creativity. In organizational teams, employees are continuously required to generate creative contributions while interacting and competing with their coworkers. This

challenging environment forces employees to compare themselves with their coworkers, especially team members with whom they closely interact. By comparing their creative abilities with those of their coworkers, individuals perceive a discrepancy between them and their superior coworkers and try to improve their creativity.

Studies on social comparison have continually accentuated the importance of upward comparison. With regard to the comparison of abilities, Festinger (1954) proposed the distinctive feature of “unidirectional drive upward.” Specifically, when people compare their abilities with those of others, they tend to choose better-performing others as comparison targets to acquire useful information on how to improve themselves because they have an innate tendency to improve their performance and become more capable than their comparison targets. In organizations where employees are continuously being pressured to improve and demonstrate their abilities, individuals tend to engage in upward comparison with more creative coworkers with an aim to improve themselves. A recent comprehensive meta-analysis of social comparison theory revealed that individuals have a strong preference for upward comparison when they do not detect any threat (J. P. Gerber et al., 2018). In addition, no evidence can support the claim that these people prefer downward comparison when they feel threatened. Therefore, upward social comparison is commonly observed in organizations where employees are coalesced as teams to achieve an effective performance. Previous studies have examined the positive influence of a superior coworker from a slightly different angle, such as role model (Zhou, 2003) and mentoring (e.g., coworker mentoring, Eby, 1997; presence of a mentor, Yamada & Tam, 1996). To address this issue, I highlight how the upward social comparison of the creative abilities of team members can develop their individual creativity.

In this study, I will elaborate the relationship between upward social comparison and creativity in various ways. First, to clarify the mechanism that links upward social

comparison with individual creativity, I propose a detailed intermediating process. Specifically, I identify emotional reactions to social comparison as a mediating process toward creativity. Given that social comparison results in diverse affective reactions, these diverse emotional reactions are expected to differentially mediate social comparison and creativity. In proposing affective reactions as a mediating process, I adopt the emotion circumplex view with valence and activation on each axis. Although recent studies in the neurophysiology and psychological disciplines have consistently called for a shift from discrete emotions to the emotional circumplex (Baas et al., 2008; Posner et al., 2005), previous studies still adopt discrete emotion or the positivity of emotions to understand emotional reactions. However, the current research practices, which mostly depend on discrete emotions, prevent us from achieving a thorough understanding of the emotional span. To address these concerns, I adopt the emotion circumplex as a mediating process between upward social comparison and creativity.

Second, I further examine the reactions to upward social comparison by considering some boundary conditions with a multilevel perspective. The reaction to social comparison is not intrinsic to the direction of comparison but largely depends on contextual factors (Buunk, Collins, Taylor, VanYperen, et al., 1990). Depending on the level of relevance and attainability, an upward social comparison result can become optimistic information (e.g., the focal person can improve himself/herself to be similar to others) or bad news (e.g., the focal person is lagging behind compared with others) (Major et al., 1991). Furthermore, unlike most existing studies on social comparison that have focused on the individual-level variables of relevance and attainability, I propose organizational contextual factors as moderators and identify what organizational managers can do to positively improve the effects of inevitable upward comparison on employee creativity.

Third, I further elaborate the basic relationship between emotion circumplex and

individual creativity by considering cognitive process as an intervening process that relates emotion with creativity. By using dual pathway theory (De Dreu et al., 2008), I propose that emotion influences the cognitive tactics that employees adopt to promote creativity. In addition to cognitive flexibility and cognitive persistence (De Dreu et al., 2008), I propose that the cognitively demotivated state may explain why some people are not creative yet cognitively withdraw their interest from creativity.

Lastly, to enrich the present understanding on individual creativity, I examine the cognitive process that lead to creativity by identifying three types of creativity outcomes, namely, radical creativity, incremental creativity, and creative disengagement. By specifying different cognitive processes that underlie different types of individual creativity, I explain the notion that each type of cognitive processes differentially leads to individual creativity (De Dreu et al., 2008).

Theoretically, this study contributes to the organizational literature in several ways. First, by applying social comparison theory, I contribute to the creativity literature by enriching the present understanding on the social cognitive aspect of creativity in team-based organizations.

Second, I offer a detailed understanding of social comparison in relation to creativity by providing contextual variables that affect individuals' reactions to social comparisons. To address the limited understanding of social comparison in organizational contexts, I propose two organizational variables, namely, creative requirement and resources for creativity, as moderating mechanisms that connect upward comparison with individual creativity. My work also contributes to social comparison theory by expanding the present research scope, which is predominantly limited to individual-level laboratory studies, to the organizational context.

Third, I build an elaborate model by proposing emotional reactions and cognitive

process as mediating mechanisms that link upward social comparison with individual creativity. By considering emotion and cognition as two important preceding mechanisms of creativity (De Dreu et al., 2008), I offer a highly comprehensive and balanced perspective for understanding individual creativity. In addition, by integrating emotional and cognitive factors, I present a highly comprehensive picture of individual creativity.

Fourth, by developing a dual pathway model that links emotion with creativity, I create a fine-grained model that provides an exhaustive dimensional view of emotion and cognition. Specifically, I adopt an emotion circumplex with valence and activation in its axes to explain affective reactions and to examine cognitive flexibility, cognitive persistence, and cognitively demotivated state as the three aspects of a cognitive process.

Finally, this research answers the continuous call for the development of a dimensional model of emotions in the social comparison and creativity literature, which conveniently adopts discrete emotions or the dichotomous approach. By providing an emotion circumplex view with valence and activation in its axes, I highlight the importance of thoroughly understanding an individual's emotional reactions to comparison results.

2. Theoretical Development and Hypotheses

Organizational teams can serve as hotbeds for individual creativity (S. J. Shin et al., 2012), and numerous studies have attempted to find how creativity is cultivated in teams. Given the increasing focus on creativity as a social process (Perry-Smith, 2006; Perry-Smith & Shalley, 2003), social relationships with other members in a work community have attracted much research attention (e.g., Rouse, 2018). Having more social relationships is beneficial for individual creativity as proven by the number of weak ties (Perry-Smith & Shalley, 2003). Similarly, enriched social interactions can explain individual creativity as proven by previous investigations on the effect of work team diversity (Choi, 2007; S. J. Shin et al., 2012) and work team climate (Hirst et al., 2011,

2009; Zhu et al., 2018). However, previous studies have neglected how having more creative coworkers in the same team can influence individual creativity through social comparison (Zhou, 2003). Therefore, in this study, I adopt the social comparison perspective to explain the effects of superior team members on individual creativity.

2.1. Social Comparison Theory

Introduced by Festinger (1954), social comparison theory deals with a major source of human concern. Social comparison is an “almost inevitable element of social interaction” (Brickman & Bulman, 1977, p.150). Social comparison theory provides a lens through which interpersonal relationships can be understood (Tesser, 1988). When objective, non-social means are unavailable, people compare their abilities or opinions with others to evaluate themselves (S. E. Taylor et al., 1990). By comparing themselves with salient others, people learn more about themselves (Festinger, 1954). With the accumulation of studies on this topic, social comparison has become a central topic in diverse research domains.

In the beginning, social comparison studies have focused on the selection of comparison targets (J. P. Gerber et al., 2018). Following the *similarity hypotheses* proposed by Festinger (1954), which suggests that people compare themselves with similar others who are identified as the best sources of self-evaluation, subsequent studies have shifted their focus toward other motivations, such as self-improvement and self-enhancement, thereby inviting additional research into upward and downward comparison. Downward comparison theory (Wills, 1981) shifted the attention of researchers from self-assessment to self-enhancement. According to this view, downward comparison (i.e., comparing an individual with someone worse off than himself/herself) is preferred under conditions where threat is present given that such activity generates a positive affect that is essential for self-enhancement. By contrast, based on construal theory, Collins (1996)

proposed that individuals prefer upward comparisons that make them feel better about themselves. Given that people do not want to become worse off than others, Collins (1996) argued that downward comparison is unlikely to be preferred by individuals. After a review of upward and downward selection studies, recent meta-analysis has revealed that people strongly prefer upward comparison when no threat is observed; moreover, study has shown that people do not prefer downward comparison even when facing threats (J. P. Gerber et al., 2018). Specifically, when abilities are concerned, individuals tend to compare themselves with superior others because an upward comparison can provide these individuals with better information and chances to improve themselves (Festinger, 1954). In organizations, financial (e.g., basic salary and performance incentives) and non-financial rewards (e.g., promotion, recognition, and additional responsibility) are determined by comparing one's abilities with his/her coworkers. Accordingly, employees focus on better-performing others as comparison targets and seek to improve themselves to become as good as or better than these targets. Therefore, to examine organizational behaviors, I specifically focus on upward social comparison.

Another issue faced in social comparison research relates to the reactions of individuals to social comparison. Upward social comparison may be perceived as a double-edged sword. On the one hand, upward comparison may signal that one is not doing as well as the others. On the other hand, learning that someone is performing much better highlights a room for improvement. Those people who focus on the bright side may feel positively as a result of the comparison, but if one focuses on the negative side of the upward comparison, s/he may end up feeling worse about himself/herself. The affective reaction to upward comparison is moderated by various factors (Buunk, Collins, Taylor, VanYperen, et al., 1990), and numerous studies have attempted to figure out the potential moderators.

Based on the transactional model of stress (Lazarus & Folkman, 1984) and the findings of previous studies (e.g., Nadler & Fisher, 1986; Tesser, 1988; Testa & Major, 1990; Wood, 1989), Major et al. (1991) proposed esteem-relevance and perceived control as two key determinants of the consequences of social comparison. Subsequent studies have empirically proved that the relevance of the dimension being evaluated (e.g. Franzoi & Klaiber, 2007) and perceived attainability/control (e.g. Lockwood & Kunda, 1997; Stewart et al., 2013) are key concerns related to the consequences of social comparison.

Despite the accumulating body of research on social comparison that endeavors to identify those factors that influence how one construes the comparison results, some serious chasms prevent us from comprehensively understanding individual reactions to social comparison. First, previous studies usually manipulate a social comparison situation such as the direction of comparison, high or low relevance, and levels of attainability, in experimental settings, and often use undergraduate students as their samples. Second, the contingency variables for the effects of social comparison are only examined at the individual level. The prevailing focus on the individual aspects of moderating variables (i.e., relevance and controllability) may effectively explain the reactions to the social comparisons of personal dimensions, such as dating and marital relationships (Morry & Sucharyna, 2016, 2018), body image (Franzoi & Klaiber, 2007; Veldhuis, Konijn, & Knobloch–Westerwick, 2017), or experimental task performance in laboratory studies (Tesser & Collins, 1988; Tesser et al., 1988). However, this is obviously not the case for examining employee reactions to upward comparison in actual organizations.

In organizations, whether the comparison domain, such as creative ability, is important to self or not is not solely determined by one's self-definition and interests but is determined by the organizational requirements. For instance, in the movie *Modern Times*, although Charlie Chaplin enjoy singing and regard music as relevant to his self-esteem,

quickly tightening bolts on a moving conveyor belt remains a relevant ability for him regardless of his personal interests. In the organizational context, irrespective of one's interest or self-definition, the relevance of the comparison domain will be determined by the job definition proposed by the organization.

Moreover, the perceived attainability of the comparison target's success in an organization largely depends on the resources and support provided by the organization. In the case of *Modern Times*, if Charlie Chaplin wants to improve his ability in rapidly tightening bolts, then the resources provided by his organization, such as good-quality wrenches or informative feedback and know-hows from his supervisor, are crucial. Despite the large number of studies on affective reactions to social comparisons, the reactions to upward comparisons in organizational situations have been rarely examined. Therefore, I propose some organizational contingencies that determine the reactions of employees to upward social comparison.

2.2. Organizational Context for Creativity: Creative Requirement

The importance of creative ability for employees is determined by the extent to which s/he is expected to generate creative ideas for his/her organization. Creative requirement stands for "the perception that one is expected, or needs, to generate work-related ideas" (Unsworth, Wall, & Carter, 2005, p. 542) and is viewed as an important predictor of employee creativity. If the job requires creativity as a significant component of employee performance, then employees will consider creativity as an important and relevant aspect of their successful performance and therefore adopt new approaches and create genuine ideas while accomplishing their job tasks (Kim, Hon, & Lee, 2010). Specifically, for those employees who engage in an upward comparison in terms of creative ability, the perception that creativity is highly required in the organization indicates that these employees need to recuperate. Moreover, given that creativity involves taking risks, organizations that create

the perception that creativity is valued and required may reduce the potential risks associated with creativity and encourage their employees to seek creativity. Therefore, creative requirement is an important contextual factor that helps employees who are facing an upward comparison engage in creativity.

2.3. Organizational Context for Creativity: Resource for Creativity

Creativity entails a high degree of mental activities and risk-taking experiences. To be creative, several resources, including time, physical assets, and psychological energy, are indispensable. Researchers have shown that having a sufficient amount of creative resources is related to achieving a creative performance (Amabile et al., 1996; C. Chen, Shih, & Yeh, 2011; Damanpour, 1991). Therefore, the availability of resources or support for creativity can be viewed as an important factor that induces employee's creativity.

The resources for creativity include everything that an organization can provide its employees to explore unusual perspectives, develop creative ideas, and foster new ideas (Amabile et al., 1996; C. Chen et al., 2011; Shalley & Gilson, 2004). Employees must have access to sufficient resources, such as time, facilities, financial support, and training, in order to be creative. For instance, slack resources provide a buffer to absorb failure and encourage employees to take more risks (Damanpour, 1991; Rosner, 1968). Having an adequate time limit allows the exploration of new ideas and creates a reasonable amount of tension to stimulate creative solutions (Amabile, 1998). Sufficient financial support reduces the possibility for employees to spend creative efforts in searching for financial resources (Amabile, 1998). The availability of training, education, and knowledge forms the basis for fostering novel ideas. Therefore, employees are expected to generate more novel ideas and improve their creative performances when they are provided with a sufficient amount of resources (C. Chen et al., 2011). Specifically, employees under an

upward comparison situation tend to believe that they can achieve a creative performance similar to others if they are given a sufficient amount of resources to develop their creativity. The creative resources provided by the team tend to increase their employees' perceived attainability of a superior performance and encourage them to engage in creative behaviors. Therefore, I hypothesize the following:

Hypothesis 1a. Upward social comparison will interact with creative requirement and resources for creativity to affect individual creativity that upward social comparison is positively related to employee creativity when creative requirement is high

Hypothesis 1b. Upward social comparison will interact with creative requirement and resources for creativity to affect individual creativity that upward social comparison is positively related to employee creativity when resources for creativity is high.

2.4. Intervening Process: Emotional Reaction to Upward Social Comparison

To fully understand how social comparison affects creativity, I propose affective reaction to upward social comparison as an underlying psychological process that explains the relationship between social comparison and creativity. Emotion represents a complex mental state that involves neural and physiological changes resulting from an internal or external stimulus event that is relevant to the major concerns of the focal person (Scherer, 2005). Previous studies show that the affective reactions to social comparison play important roles in forming individual behavior (Buunk, Collins, Taylor, VanYperen, et al., 1990; Richard H. Smith, 2000; Wehrens et al., 2010; Wood, 1989), and a growing number of research have focused on the role of affective reactions resulting from social comparison in characterizing individual behavior and revealed that emotional arousal can promote the activation and exertion of energy in a goal-directed behavior (Diefendorff & Chandler, 2010; Rahimi, Hall, Wang, & Maymon, 2017; Zheng, Baskin, & Peng, 2018). For example, negative emotional reactions to social comparison may lead to frustration and

demotivation to achieve the desired end states (Diefendorff & Chandler, 2010), whereas envy mediates the effect of incidental social comparison on consumers' materialism and their subsequent spending behavior (Zheng et al., 2018). Despite the importance of emotion in stimulating creativity (Amabile, Barsade, Mueller, & Staw, 2005; Baas et al., 2008), virtually no research has examined this subject. Accordingly, I propose that the upward social comparison of creative ability influences the creativity of an individual through affective reactions.

Although social comparison studies have initially focused on the direction of comparison, contemporary researchers have shifted their attention to the consequences of comparison results (J. P. Gerber et al., 2018). Affective reactions have received much research attention. Smith (2000) specified 15 affective reactions to social comparison that depend on the comparison direction, the desirability of the results, the focus of attention, and the contrastive versus assimilative nature of the reaction. Similarly, Buunk et al. (2005) identified eight types of affective reactions that depend on the comparison direction, the contrast versus identification nature of reaction, and the focus of attention (Buunk, Kuyper, et al., 2005). Although these two studies agree on some affective reactions (e.g., resentment, worry, and contempt), the emotional spheres they cover show substantial differences for the other emotional reactions (Buunk, Kuyper, et al., 2005).

In this case, the prevailing dependency of extant research on discrete emotions poses some serious disadvantages. First, assigning different labels to each discrete emotion may hamper the continuance of research because doing so may make the findings of studies difficult or impossible to compare (Baas et al., 2008). Second, labeling discrete emotions can create some problems given the different levels of familiarity of the respondents with specific emotional terms and their subsequent conscious interpretations of what people already know about emotion words (Eerola & Vuoskoski, 2011). Third, individuals

experiencing mixed feelings may be misled to a “selected” discrete emotion instead of correctly reporting the emotions they are experiencing (Eerola & Vuoskoski, 2011). Certain response formats may also cause problems such that the provided extensive word list may engender confusion and order effects and that selecting certain emotion words may expose the research aim (Scherer, Shuman, Fontaine, & Soriano, 2013).

Recent studies across many disciplines, including neurophysiology, music psychology, and social and organizational psychology, identify the dimensional model as the best approach for exploring emotional states (Baas et al., 2008; Posner et al., 2005). In their meta-analysis of mood–creativity studies, Baas et al. (2008) found that emotions can best be described by the 2D model (Baas et al., 2008). A growing body of research in neurophysiology reveals that affective reactions can best be understood by using a dimensional model with hedonic tone and activation in its two axes (Barrett, 1998; Eerola & Vuoskoski, 2011; A. J. Gerber et al., 2008; Posner et al., 2005). A music psychology study that compares the discrete and dimensional models of emotions also identifies the 2D model as the best tool for understanding affective reactions (Eerola & Vuoskoski, 2011).

In sum, to address the limitations in relation to the use of discrete emotions and to answer the call for further research on a wider array of emotional reactions (Baas et al., 2008), the 2D model with two axes is considered the optimal tool for exploring basic emotions (Eerola & Vuoskoski, 2011; Gu et al., 2018). Therefore, to comprehensively understand emotional reactions to social comparison, I propose an emotion circumplex with the axes of valence and activation as intermediating processes between upward comparison and individual creativity.

As previously discussed, employee reactions to social comparison depends not on the comparison direction but on the contextual contingencies. While upward comparison may

deliver both positive and negative signs on one's status, the affective reactions to this comparison depend on how one construes the information obtained from the comparison. By using the transactional model of stress (Lazarus & Folkman 1984), Major et al. (1991) proposed that an individual's response to a stressful situation differs depending on his/her appraisal of a comparison. Specifically, the relevance of the social comparison domain influences the primary appraisal of the comparison situation as either threatening or not. An upward comparison in a highly relevant comparison domain can threaten one's esteem, thereby leading to the activated state of emotions (Oei et al., 2012). In organizations, those employees who perceive that their job requires a high amount of creativity will also perceive the importance of being creative personnel in their organization. Given that an upward comparison indicates that an employee is lagging behind in a dimension that is considered important in his/her organization, s/he will feel threatened and emotionally activated. By contrast, having a low creative requirement suggests that an upward comparison situation is a benign-positive experience for the focal employee. In this case, this employee has no reason to be aroused, thereby resulting in his/her deactivated emotional state.

Although the relevance of the comparison domain clearly leads to bifurcated reactions, empirical studies reveal that individuals in relevant upward comparison situations show different reactions depending on whether they believe that they can achieve the same level of excellence demonstrated by a comparable other. Self-threat from relevant upward comparison with a high perceived control induces instrumental behaviors and positive affect, while the same threatening situation with a lack of control can lead to a negative affect (Nadler & Fisher, 1986). For instance, when facing an accountant with outstanding career achievements, undergraduate students majoring in accounting are differentially influenced by this superstar depending on their expected attainability (Lockwood & Kunda,

1997). First-year students who think they can become as successful as the comparison target (high perceived attainability) positively responded to the superstar (upward comparison), while fourth-year students, for whom it seems too late to achieve a similar level of success (low perceived attainability), negatively responded. Accordingly, the belief that one can possibly obtain the same achievements as the comparison target and thereby reduce the discrepancy between him/her and the target determines whether or not this focal person will positively respond to upward comparison. In organizations, creative resources provided by leaders and the organization will encourage employees to construe the upward comparison situation as an informational indicator that they can improve themselves to be similar to their superior team members, thereby promoting hopeful, positive affectivity (Amabile, Schatzel, Moneta, & Kramer, 2004).

Therefore, if employees who are facing upward social comparison situation also perceive that their jobs require a high level of creativity, their emotional activation level will be increased. If employees under upward social comparison situation find out that they are provided with generous resources for creativity, their emotional reactions will be positive. Thus, the following relationships are hypothesized:

Hypothesis 2a. Creative requirement moderates the relationship between upward social comparison and emotional activation in such a way that emotion will be activated when creative requirement is high.

Hypothesis 2b. Resources for creativity moderates the relationship between upward social comparison and emotional valence in such a way that emotional reaction will be positive when resources for creativity is high.

2.5. Intervening Process: Cognitive Process

Affective reactions to upward comparison can induce cognitive processes. The affective influence on individual cognition has been validated in previous studies (e.g.,

affect-infusion model, Forgas, 1995; broaden and build theory, Fredrickson, 2001; feelings-as-information theory, Schwarz, 2012). Activation is related to the release of dopamine and noradrenaline, which boost the performance of working memory (Kimberg, D'Esposito, & Farah, 1997) and influence one's novelty-seeking behavior and creative drive (Flaherty, 2005). Emotionally activated individuals, compared to deactivated people, thus tend to have more energy to exert in searching information and integrate it. When emotionally activated, individuals have more capacity to solve complex problems and consider multiple alternatives (Baas, De Dreu, & Nijstad, 2011; De Dreu et al., 2008). Some researchers argue that the intensity of affect determines one's cognitive task performance (Easterbrook, 1959; George & Zhou, 2007; Larsen & Diener, 1987). Meanwhile, a low level of activation is related to inactivity and avoidance, which results in neglect of information and low cognitive performance (Baas et al., 2008).

Another component of emotion, valence, is also differentially related to the cognitive process. Positive affect expands the repertoires of thought and action (Fredrickson, 2001), whereas negative mood narrows down an individual's thought-action repertoire. Positive emotions also broaden individuals' receptivity to new information and allow them to utilize more general knowledge when performing tasks (Bless et al., 1996; Fredrickson, 2001). Given that a positive state enhances brain activation, those individuals with positive emotions tend to rely on global concepts drawn from memory and are more able to associate distance concepts compared with those who feel negative emotions (Bolte, Goschke, & Kuhl, 2003). By contrast, negative emotions tend to rely on local information and process information from external stimuli instead of memory (Gasper & Clore, 2002; Kuhbandner et al., 2009). In sum, positive emotion broadens one's focus of attention, thereby encouraging a highly inclusive, flexible, and unusual thinking (Amabile et al., 2005; Fredrickson & Branigan, 2005), whereas negative emotions are related to narrowed

focus of attention, systematic generation and processing of information, and increased investment of efforts (Baas et al., 2008).

Taken together, those individuals with activated positive emotion are filled with energy and have an increased attention span to search for information. These individuals benefit from their high receptivity to new information and their increased energy to search and integrate the information such that they can associate distant, new information from different categories. With loose, heuristic attention, those individuals who feel activated positive emotion can generate and process unusual and flexible ideas in novel categories. Therefore, activated positive emotion is related to cognitive flexibility.

By contrast, activated negative emotion narrows one's focus of attention, lowers his/her cognitive flexibility, and reduces his/her ability to shift attention. Therefore, this type of emotion narrows down viable cognitive categories (Mikulincer, Florian, & Tolmacz, 1990), and those individuals who feel such emotion tend to rely on extant thought-action repertoires when processing concrete external information and stick to given categories. With activated energy, individuals dedicate more effort in integrating and processing information in systematic and analytical ways yet tend to adhere to given categories because of their reduced attentional focus. Therefore, activated negative emotion is related to cognitive persistence.

Individuals with a deactivated emotion demonstrate low energy in their search and integration of information. Having a low level of activation will also under-stimulate individuals and reduce their energy (Gardner, 1986), thereby resulting in inactivity and avoidance. Although emotional valence can inspire people to adopt certain cognitive strategies, given the low energy level of these people, they become cognitively demotivated and draw their attention away from cognitive processes. Although emotionally deactivated individuals do not completely disengage themselves from the

cognitive process, they are cognitively demotivated. Given that this demotivated state has been largely ignored in previous studies, I propose *cognitive demotivation* as a third cognitive state.

Hypothesis 3a. Activated positive emotion is positively related to cognitive flexibility.

Hypothesis 3b. Activated negative emotion is positively related to cognitive persistence.

Hypothesis 3c. Deactivated positive and negative emotions are positively related to cognitive demotivation.

Building on the above discussion, I propose that affective reactions have an intermediating role in the relationship between upward social comparison and cognitive process. Those individuals who perceive that their coworkers are excelling in terms of creative ability will be cognitively activated to respond to this upward comparison situation. Based on their perceptions toward their organizational contexts in which creativity is required and resources for creativity are provided, employees will first affectively respond to their situation. Their affective reaction, in turn, will be related to their cognitive reactions. Previous studies on the affective influence on the content and process of cognition also reveal that affect determines an individual's reactions to social stimulation (Forgas, 1992, 2017). Upward social comparison is construed based on one's organizational context to engender the employees' affective reactions, which in turn influence their cognitive processes (Forgas, 2017). Therefore, I propose that the relationship of cognitive reactions with the interaction between upward social comparison and organizational context for creativity is mediated by affective reactions.

Hypothesis 4a. The upward social comparison of creative ability is positively related to cognitive flexibility through activated positive emotion.

Hypothesis 4b. The upward social comparison of creative ability is positively related to cognitive persistence through activated negative emotion.

Hypothesis 4c. The upward social comparison of creative ability is positively related to cognitive demotivation through deactivated positive emotion.

Hypothesis 4d. The upward social comparison of creative ability is positively related to cognitive demotivation through deactivated negative emotion.

2.6. Radical Creativity, Incremental Creativity, and Creative Disengagement

I posit that the affective reactions to upward social comparison, which are based on one's perceptions toward his/her organizational context for creativity (including creative requirement and creativity resources), are related to individual creativity through the cognitive process. To elaborate the role of different cognitive pathways to different types of creativity, I adopt radical creativity and incremental creativity as two types of creativity that are prevalent in organizations and examine them along with creative disengagement, which refers to the propensity for individuals to intentionally withdraw their cognitive resources from creativity.

Creativity refers to the production of novel and useful ideas (Amabile, 1983). Although the "essence of creativity cannot be captured in a single variable" (Sternberg, 1999, p. 84), most studies have examined creativity as a unitary construct, thereby limiting their understanding of the process and factors that underlie such phenomenon. By focusing on a different magnitude of change, Mumford and Gustafson (1988) suggested that creative ideas range from minor adaptations to radical breakthroughs. They added that the psychological processes that underlie different creative contributions may also vary. As the research interest toward this topic continues to grow, different types of creativity have emerged from the literature. For example, Sternberg (1999) proposed seven types of creativity contributions that depend on the amount and types of creativity displayed. A matrix of four creativity types was proposed by taking into account the problem type and the drivers of engagement (Unsworth, 2001). Meanwhile, Kaufman and Beghetto (2009)

developed a four C model (i.e., big-C, little-c, mini-c, and pro-c) that distinguishes four types of creativity to account for the intrapersonal and professional aspects of this phenomenon (Kaufman & Beghetto, 2009).

Alternatively, Gilson and Madjar (2011) proposed radical creativity and incremental creativity, which focus on novelty and usefulness, respectively. Radical creativity refers to set-breaking ideas that change the existing practices and alternatives into a substantially different framework (Gilson & Madjar, 2011), whereas incremental creativity refers to modifying the existing practices and products and is more focused on usefulness than on novelty. Given that minor adaptations to existing products and services are required for the survival and continuance of an organization and that a paradigm-shifting creativity, such as the development of smartphones, is crucial for an organization to achieve prosperity, both radical creativity and incremental creativity must be nurtured by organizations to achieve success in a highly competitive environment. Previous studies suggest that those factors and processes that may influence different types of creativity must be clarified to profoundly understand creativity (e.g. Madjar, Greenberg, & Chen, 2011). These studies also reveal that different factors and processes can lead to different levels of engagement in creativity. Radical creativity is more strongly predicted by intrinsic motivation than by extrinsic motivation, is related to problem-driven ideas and ideas generated in abstract theory, and associated with certain factors, including willingness to take risks, resources for creativity, and career commitment. Meanwhile, incremental creativity is well explained by extrinsic motivation, the ideation for finding a solution to an already-defined problem, ideas based on concrete practices, and certain factors, including the presence of creative coworkers as role models and organizational identification (Gilson & Madjar, 2011; Madjar et al., 2011). Creative self-efficacy partially encourages employees to search for ideas outside their organizational boundaries, thereby resulting in a high level of radical

creativity (Jaussi & Randel, 2014). Intrinsic and extrinsic motivational orientations influence creativity through personal creativity goal, and the indirect influences show a positive linear relationship for incremental creativity and an inverted U-shaped relationship for radical creativity (Gong, Wu, Song, & Zhang, 2017). Following these studies, different work processes and antecedents clearly promote or hinder incremental and radical creativity.

However, these studies have only focused on individual-level factors and processes, while team compositions and processes may also significantly influence the sense-making processes and the creativity outcomes of employees (Gong et al., 2017). Radical creativity, compared with incremental creativity, is risk-taking in nature and entails more set-breaking ideas that may provoke substantial changes to how people perform their work in an organization (Gilson et al., 2012). Therefore, the social relationships within an organization or within a team where members directly interact with one another can substantially influence either incremental or radical creativity through different emotional and cognitive sense-making processes. To this end, I posit that the different cognitive processes induced from upward social comparison are related to different types of creativity.

Effectively facilitating employee creativity entails not only the exploitation of avid creators but also the fostering of unenthusiastic employees. The few studies that investigate the factors and processes of different creativity engagement levels have largely ignored those employees who gave up on creativity or decided to withdraw their attention and effort from creativity. To examine the differential influences of social and personal factors on various levels of creativity, Madjar et al. (2011) compared radical creativity, incremental creativity, and routine performance (Madjar et al., 2011). However, routine performance is a dimension separate from creativity and refers to neither a low level of creativity nor a

performance endowed with both radical and incremental creativity. I attempt to compare different levels of employee engagement in creativity to achieve a fair comparison within the creative performance domain. By investigating radical creativity and incremental creativity along with creative disengagement, I attempt to highlight the pure dynamism of creativity domain.

According to the dual pathway model, cognitive flexibility is characterized by “the use of many, broad, and inclusive cognitive categories” (De Dreu et al., 2008, p.740). Individuals with a cognitive flexibility have a lower threshold for ideas to be accepted in working memory; therefore, these people may take seemingly irrelevant and poor thoughts into consideration (Nijstad et al., 2010). Broad and inclusive cognitive categories combined with a generous and wide variety of thoughts can create remote and unique associations that substantially differ from existing practices and alternatives (Gilson & Madjar, 2011).

Radical creativity requires flexibly discovering, experimenting, and playing with ideas to develop a set-breaking framework (Gilson & Madjar, 2011). Radical creativity refers to ideas and practices that substantially differ from the extant practices and alternatives. Therefore, radical creativity can be achieved from ideation based on paradigms that completely differ from the existing frameworks, which is possible through cognitive flexibility. The flexibility pathway establishes remote associations that are crucial for radical creativity through the broad inclusion of different categories and flexible switching among different categories. Therefore, flexibility pathway is related to radical creativity.

Hypothesis 5a. Cognitive flexibility is positively related to radical creativity.

Cognitive persistence is distinguishable as it entails a systematic and effortful search for new possibilities in few cognitive categories. Those individuals with cognitive persistence have a high threshold for ideas to enter their working memory, thereby

blocking out irrelevant and distracting thoughts in advance (Nijstad et al., 2010). When thoughts from remote categories are not available in their working memory, individuals tend to search for ideas in categories within their reach. After a hard work of generating obvious and readily available thoughts, cognitively persistent individuals acquire original ideas in the end. Besides, according to associative theory, creative ideas are gained from remote associations, which require ‘time’ (Mednick, 1962; Runco & Chand, 1995). Persistent cognitive efforts may first generate some obvious ideas, but after spending time with continued thoughts, people with cognitive persistence come up with original associates.

Incremental creativity is adaptive in nature and focuses on the modification of products and processes that are existing in an organization (Gilson & Madjar, 2011). Finding new applications and refinements to existing work processes requires an in-depth investigation of the current procedures and products. Cognitive persistence facilitates a systematic investigation of the problem space with prolonged effort, thereby providing a sufficient space for the development of ideas until obvious solutions are examined and discarded and original insights are generated (Nijstad et al., 2010). Cognitively persistent employees also spend more time and effort in their assigned tasks, which is known to facilitate productivity and innovation to some extent (Ko & Choi, 2019). Therefore, I hypothesize the following:

Hypothesis 5b. Cognitive persistence is positively related to incremental creativity.

Cognitive motivation is widely accepted as an important prerequisite of creativity (M. A. Collins & Amabile, 1999). Given that motivation is central to productivity and creativity, cognitively demotivated people lack enough energy to deliver focal behavior (Ryan & Deci, 2000). When cognitively demotivated, employees may withdraw their creative efforts and disengage from creativity. These cognitively demotivated employees are expected to

reduce their cognitive resources to invest in a creative performance. Regardless of their performance in routine tasks, cognitively demotivated employees may avoid opportunities to make novel suggestions. These people would try to reduce the saliency of their disparity with others and stick to conventional way of solving problems (H. J. Klein, 1989). Given that creativity entails an investment of innate mental resources, cognitively demotivated individuals who withdraw their cognitive resources are disengaged from creative behaviors.

Hypothesis 5c. Cognitive demotivation is positively related to creative disengagement.

CHAPTER 4. EMPIRICAL STUDY

1. Sample and Data Collection Procedure

I collected field data by distributing questionnaires to empirically test the research framework. Participants were team members and leaders in Korean organizations that adopt teams as major working systems. I collected two waves of data with an interval of four weeks to examine the hypothesized causal relationships thoroughly and to reduce the potential common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Data were collected from 18 organizations in diverse industries, including IT/programming, manufacturing, and financial services, to achieve superior external validity of the study result. Participants received a \$5 gift card for completing each questionnaire.

Initially, I distributed the survey twice to the participants with an interval of four weeks. At the first wave, questionnaires were distributed to 500 individuals and their leaders. A total of 420 members in 96 teams accomplished the survey (84% response rate). After a four-week interval, questionnaires were again distributed, and 398 members from 93 teams returned their envelopes (79.6% response rate). After removing partial data by using full information maximum likelihood method, responses of 306 members from 80 teams were used for analyses by Mplus 8.3. Each member answered all preceding variables prior to creativity. For perceptions toward upward social comparison, employees evaluated their team members' creative ability relative to their own. Although the hypotheses focus on team level moderators, I collected individual perceptions of relevance and attainability for rigorous examination of moderation effect in both levels. They also answered for their perceived attainability of the comparison gap, perceived relevance for creativity, creative requirement of their jobs, and creative resources supported by their teams. Creative requirement and resources for creativity were aggregated to the group level by calculating the mean value of each team to examine organizational context for creativity. I justified

their empirical appropriateness of aggregation using r_{wg} as a measure of within-group agreement (James, Demaree, & Wolf, 1984) and ICC(1) and ICC(2) as intraclass correlation coefficient (Bliese, 2000; G. Chen, Bliese, & Mathieu, 2005). Team members also answered for emotions they feel when engaged in creative problem solving with their teammates (i.e., activated positive, activated negative, deactivated positive, and deactivated negative) and their cognitive states (i.e., cognitive flexibility, cognitive persistence, and cognitive demotivation). For the control variables, I asked members for social comparison orientation and all participants for demographic variables. At the end of the questionnaire, all participants were required to provide a part of their phone number (4-digit numbers in the middle of the 11-digit phone number).

Affective reactions, cognitive attitudes, and creative outcomes were assessed to eliminate potential causality issues, using data from the second-wave survey, which were collected after a month delay (Cole & Maxwell, 2003). I asked team leaders to rate radical creativity, incremental creativity, and creative disengagement of their subordinates and to provide team-related information to overcome single-source bias (Avolio, Yammarino, & Bass, 1991; Podsakoff & Organ, 1986). When evaluating subordinates' creative outcomes, team leaders were asked to write each member's age and four-digit phone number to match the evaluation result with members' answers correctly. The part of participants' phone number was used to distinguish individuals and match surveys because it seldom overlaps but ensures anonymity. Each questionnaire was distributed in an envelope stating that it should be sealed after the response. Supervisors were asked to collect the sealed questionnaires from team members and seal them in a team envelope.

The final sample ($n=306$) included 183 female (59.8%) and 123 male (40.2%) employees with an average age of 33.2 years ($SD=5.6$). Participants had an average team tenure of 25.1 months ($SD=26.7$), an average company tenure of 36.7 months ($SD=35.4$),

and an average total tenure of 88.1 months ($SD=57.0$). The sample of employees consisted of 127 staff (41.5%), 88 assistant managers (28.8%), 63 managers (20.6%), and 28 assistant general managers or those at a higher rank (9.2%). In the analysis sample, 22 held a high school degree (7.2%), 49 held a community college degree (16%), 207 held a bachelor's degree (67.6%), and 28 held a master's or higher degree (9.2%). Data were collected from diverse industries, such as IT/programming (22.9%; e.g., mobile gaming company), manufacturing (20.9%; e.g., clothing company), service industries (19.6%; e.g., advertising agency), finance (10.1%; e.g., community financial services association), and others (26.5%; e.g., social contribution foundation).

2. Ethical Considerations

All ethical guidelines related to human participants were applied. The questionnaire and procedures were reviewed and approved by the Institutional Review Boards (IRBs). According to IRB's guidelines, I provided potential participants with a separate sheet of information about the purpose of the study. Participants were also assured that participation in the study is completely voluntary, and individual information would strictly remain confidential. Team leaders were informed that teams and organizations participating in the study will remain anonymous in subsequent publication of the results. Finally, I informed participants that all records will be accessible only to the researcher, and any private information will be destroyed as soon as the data from different sources were matched for analysis.

3. Measurement

I developed all variables originally in English, translated them to Korean, and asked multiple specialists to back-translate them to ensure semantic equivalence (Brislin, 1980). I used multi-item measures with acceptable internal consistency reliability to assess all variables. The items were measured on a 5-point Likert scale ranging from 1 (strongly

disagree) to 5 (strongly agree).

Social comparison of creative ability. I constructed a six-item measure for the comparison of perceived creative ability between self and coworkers by adopting the creative ability measure of Choi, Anderson, and Veillette (2009), who in turn adopted several items from Amabile (1988) and Choi (2004). I measured the direct assessment of upward comparison of creative ability using six items with the following referent: “my team members are better than me at...” (a) “intuitive thinking,” (b) “using their imagination,” (c) “generating new ideas,” (d) “presenting creative solutions to a given problem,” (e) “general creativity,” and (f) “making creative performance” ($\alpha=.93$).

Creative requirement. I used the four-item measure of Choi, Anderson, and Veillette (2009) that adopted several items from Unsworth et al. (2005) ($\alpha=.91$, ICC[1]=.45, ICC[2]=.75, rwg=.84) to measure creative requirement. The items in this scale included (a) “my job often requires me to be creative,” (b) “my job requires me to present creative ideas for a given problem,” (c) “my job requires me to generate new ideas,” and (d) “my job requires me to offer alternative explanations for a given phenomenon.”

Resources for creativity. I constructed a four-item measure to determine the extent to which employees perceive that they are being provided by their team with the necessary resources to engage in creativity ($\alpha=.82$, ICC[1]=.45, ICC[2]=.78, rwg=.83). I adopted resources for creativity items from Madjar, Greenberg, and Chen (2011) to reflect four important dimensions of resources: material, time, fund, and general resources (C. Chen et al., 2011; Rosello & Tran, 2011). Sample items included (a) “the available resources in this team allow me to explore new ideas,” (b) “I can easily get the materials I need to develop new ideas and practices,” (c) “I have sufficient time to engage in creative activities during my working hours,” and (d) “I have sufficient funds to develop new ideas and practices.”

Relevance of creativity. I used a three-item measure based on the self-relevance

measure of Tsai, Yang, and Cheng (2014) to assess employees' perceived relevance of creativity ($\alpha=.86$). The three items were (a) "being creative is very important to me," (b) "being creative is related to my 'self,'" and (c) "being creative is connected to my future in the organization."

Perceived attainability. I constructed four items for measuring perceived attainability of creative ability ($\alpha=.85$) by adopting the attainability items of Lockwood and Kunda (1997). The items included (a) "my creativity is changeable in this team;" (b) "if I work at it, I can improve my creativity in this team;" (c) "my creative ability changes according to my working environment;" and (d) "I can enhance my creativity if necessary."

Affective reactions. I used the job-related affect measure (Warr, Bindl, Parker, & Inceoglu, 2014) to identify 13 emotions that fully fit each quadrant of the emotion circumplex. I asked the participants to indicate to what extent they feel certain emotions when working on creative tasks in their team with their coworkers by using a five-point scale (1=not at all, 5=strongly). Each item began with "when I work on creative tasks with my coworkers within my team, I feel..." Items for positive activated affect included "enthusiastic," "inspired," and "excited" ($t_2 \alpha=.85$). Items for positive deactivating affect included "at ease," "calm," "laid back," and "relaxed" ($t_2 \alpha=.85$). Items for negative activating affect included "nervous," "tense," and "worried" ($t_2 \alpha=.92$). Items for negative deactivating affect included "depressed," "dejected," and "hopeless" ($t_2 \alpha=.88$).

Cognitive flexibility. I used four items from Martin and Rubin (1995) to measure cognitive flexibility ($t_2 \alpha=.85$). These items included (a) "in this team, I am willing to work at creative solutions to problems;" (b) "when I work in this team, I have many possible ways of behaving in any given situation;" (c) "I am willing to listen and consider alternatives for handling a problem;" and (d) "I have the self-confidence necessary to try different ways of behaving."

Cognitive persistence. On the basis of the items of need for cognition (Cacioppo & Petty, 1982) and dimensions of mastery (Morgan, Busch-rossnagel, Barrett, & Wang, 2014), I constructed a four-item scale with the following items ($\alpha=.86$): (a) “when I work in this team, I try to find solutions to a problem even if it will take a long time to finish;” (b) “when I work within this team, I work for a long time trying to do something difficult;” (c) “I work for a long time trying to solve a problem when I am working in this team;” and (d) “in this team, I prefer an intellectual task to one that doesn’t require much thought.”

Cognitive demotivation. Drawing on the need for cognition items (Cacioppo & Petty, 1982), I constructed a measure for assessing cognitive demotivation that included the following items ($\alpha=.86$): (a) “when I work in this team, I prefer simple to complex problems;” (b) “in this team, I don’t like having the responsibility to handle situations that require a lot of thinking;” (c) “when I work in this team, I try to anticipate and avoid situations where I may be required to think deeply about something;” and (d) “when I work in this team, I would rather do something that requires little thought than something that challenges my thinking abilities.”

Radical creativity and incremental creativity. I used four items from Madjar, Greenberg, and Chen (2011) and Jaussi and Randel (2014) to assess radical and incremental creativity, respectively. I changed the referent of scale items from “I” to “s/he” to evaluate follower creativity. Items for radical creativity ($\alpha=.90$) included (a) “s/he is a good source of highly creative ideas,” (b) “s/he demonstrates originality in his/her work,” (c) “s/he suggests radically new ways for doing his/her work,” and (d) “s/he identifies opportunities for new processes.” Items for incremental creativity ($\alpha=.85$) included (a) “s/he uses previously existing ideas or work in a slightly different fashion,” (b) sS/he is very good at adapting existing ideas,” (c) “s/he easily modifies previously existing work processes to suit his/her current needs,” and (d) “S/he finds new uses for existing methods

or equipment.” I added instructions at the top of each page of the leader survey to clarify that the questions correspond to employees’ creative outcomes only and that general job performance was not the focal interest of this survey.

Creative disengagement. I developed a four-item measure to assess disengagement from creativity by adapting disengagement measures of intellectual engagement inventory (Major & Schmader, 1998). I shifted the referent from “I” to “s/he” and customized the context from academic intelligence to disengagement from creativity. Items in this scale included (a) “s/he really doesn’t care what others say about his/her creativity,” (b) “creative evaluations will not change his/her opinion of her/himself at work,” (c) “s/he doesn’t care about making creative solutions,” and (d) “It usually doesn’t matter to him/her how creative s/he is” ($\alpha=.84$).

Control variables. In addition to the aforementioned variables, I included several control variables to minimize the potential confounding effects on the associations among the variables in the current model. I controlled for demographic characteristics, including age, function, total tenure, and tenure in the current team and company, because these demographic variables are likely to influence employees’ reactions to team dynamics and subsequent creative outcomes (Bunderson, 2003; S. J. Shin et al., 2012). Given that the sample includes various types of teams across different industries, I controlled for team and leader characteristics, including industry, leader age, and leader education. Several dummy variables reflecting the industry (manufacturing and IT/programming which are two main source of the data), employee function (1=clerical, 0=others), and employee and leader gender (1=male, 0=female) were also included in the analysis. In addition to demographic variables and team characteristics, I controlled for social comparison orientation because of its potential effect on social-comparison-related reactions (Buunk, Zurriaga, Peiró, Nauta, & Gosalvez, 2005). I used the short version of Gibbons and

Buunk's (1999) social comparison orientation measure, which included the following items ($\alpha=.88$): (a) "I always pay a lot of attention to how I do things compared with how others do things;" (b) "I often compare how I am doing socially (e.g., social skills, popularity) with other people;" (c) "I am not the type of person who compares himself/herself often with others" (reversed); (d) "I often try to find out what others think when they face similar problems as I face;" (e) "I like to know what others would do in a similar situation;" and (f) "If I want to learn more about something, I try to find out what others think about it."

CHAPTER 5. RESULTS

1. Preliminary Analysis

Before testing the hypotheses developed in the previous chapter, I conducted preliminary tests to ensure empirical distinctiveness of the study variables. I first assessed the internal consistency reliability (Cronbach's α) of all variables and then evaluated the within-group agreement (r_{wg}) and ICC for creative requirement and creativity resources to justify group-level aggregation of these variables, which was reported in the previous chapter. Second, I performed a multilevel confirmatory factor analysis (CFA) on the full model with individual-level variables (i.e., upward social comparison, affective reactions, cognitive processes, creativity outcomes, relevance for creativity, perceived attainability) and on the full model including team-level variables reflecting team context for creativity (i.e., creative requirement, resources for creativity) to ensure the distinctiveness of the study variables. I also conducted CFA on the constructs assessed by employees (upward social comparison, affective reactions, cognitive processes, relevance for creativity, and perceived attainability) and by team leaders (radical creativity, incremental creativity, and creative disengagement). The hypothesized model exhibited good fit to the data.

Furthermore, I performed a series of alternative CFA on four affective reactions, three cognitive states, and three creative outcomes. For example, I constructed alternative models of plausible two-factor model of affective reactions (by combining emotions into two factors reflecting positive and negative emotions; $\chi^2[64]=951.64$, $p<.001$, RMSEA=.22, CFI=.60, TLI=.51, and SRMR=.18), two-factor model of cognitive process (by combining cognitive flexibility and cognitive persistence; $\chi^2[53]=271.50$, $p<.001$, RMSEA=.12, CFI=.84, TLI=.80, and SRMR=.07), and a two-factor model of creative outcome (by combining radical creativity and incremental creativity; $\chi^2[34]=125.80$, $p<.001$, RMSEA=.10, CFI=.95, TLI=.93, and SRMR=.05). The alternative models showed significantly poorer fit, confirming empirical validity of the hypothesized factor structures. Given the empirical confirmations from preliminary analysis, I tested the hypothesized relationships. Table 1 provides the results of the CFA analyses. Table 2 presents the descriptive statistics and intercorrelations between all variables examined in the study.

2. Multilevel Analytic Strategy

I used Mplus 8.0 (Muthén & Muthén, 2017) to account for the nested structure of the present data because it enables simultaneous tests of multiple relationships by using multilevel structural equation modeling. I conducted a structural path analysis using the scale means of each variable instead of item-level indicators because the present model has numerous parameters (Bandalos & Finney, 2001; Sung & Choi, 2018).

I first conducted single- and multi-level analyses to examine the moderated relationships because these hypotheses contain single- and multi-level structure, where team-level variables (i.e., creative requirement, resources for creativity) moderated the relationship between upward social comparison and outcome variables.

Table 1. Confirmatory Factor Analysis Models

Model	Description	χ^2	df	<i>p</i>	RMSEA	CFI	TLI	SRMR(W)	SRMR(B)
Single-level full model	Upward social comparison, Affective reactions, Cognitive processes, Creativity outcomes, Relevance for creativity, Perceived attainability	1573.605	1002	0.000	0.039	0.932	0.924	0.053	
Multilevel full model	Upward social comparison, Affective reactions, Cognitive processes, Creativity outcomes, Creative requirement, Resources for creativity	1575.298	1068	0.000	0.036	0.942	0.935	0.055	0.304
Member-rated variables	Upward social comparison, Affective reactions, Cognitive processes, Relevance for creativity, Perceived attainability	1039.015	620	0.000	0.043	0.934	0.925	0.058	
Affective reactions	Activated positive affect, Activated negative affect, Deactivated positive affect, Deactivated negative affect	170.098	59	0.000	0.081	0.949	0.933	0.069	
Cognitive processes	Cognitive flexibility, Cognitive persistence, Cognitive demotivation	91.334	51	0.000	0.052	0.971	0.962	0.040	
Creative outcomes	Radical creativity, Incremental creativity, Creative disengagement	60.005	32	0.002	0.056	0.984	0.978	0.036	

Table 2. Means, Standard Deviations, Correlations for Variables (1/2)

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Leader Gender ^a	0.69	0.46														
2 Leader Age	43.45	6.07	.37**													
3 Leader Function (dummy)	0.52	0.50	.28**	.23**												
4 Manufacturing (dummy)	0.24	0.42	-.29**	.17**	-.08											
5 IT/Programming (dummy)	0.21	0.41	.36**	.05	-.14**	-.29**										
6 Gender ^a	0.40	0.49	.31**	.20**	.09	-.19**	.34**									
7 Age	33.55	5.80	.20**	.36**	.18**	-.03	.02	.20**								
8 Team Tenure	25.88	26.88	.07	.14*	.04	.04	.02	-.01	.27**							
9 Company Tenure	39.93	40.85	.06	.17*	.05	-.07	-.05	.02	.50**	.60**						
10 Total Tenure	91.36	60.96	.09	.26**	.15**	.05	-.03	-.02	.79**	.26**	.39**					
11 Function (dummy) ^b	0.45	0.50	.15**	.11*	.53**	-.19**	-.13*	-.02	.18**	.05	.24**	.07				
12 Hierarchical Level	2.03	1.05	.22**	.34**	.14*	.10	.01	.20**	.73**	.28**	.39**	.65**	.05			
13 Social Comparison Orientation	2.98	0.80	-.03	-.09	.11	-.05	-.12*	-.02	-.14*	.02	.06	-.11	.09	-.10		
14 Upward Social Comparison	3.28	0.69	-.05	.04	-.04	.11*	-.10	.00	.02	-.02	.00	.05	-.10	.07	-.03	
15 Creative Requirement	3.83	0.55	.09	.29**	-.20**	.23**	-.05	-.07	.00	-.02	-.13*	.09	-.29**	.20**	-.01	.36**
16 Resources for Creativity	2.96	0.56	-.01	.12*	-.01	.05	.14**	.09	.18**	.06	.11	.09	.00	.19**	.03	.31**
17 Relevance for Creativity	3.85	0.81	.11	.23**	-.07	.19**	.06	.13*	.01	-.04	-.10	.05	-.20**	.13*	.06	.33**
18 Perceived Attainability	3.93	0.65	-.04	.06	.01	.21**	-.07	.07	-.09	-.02	-.14*	-.04	-.11*	.00	.08	.17**
19 Activated Positive Affect	3.58	0.69	-.01	.06	-.01	.23**	-.12	-.02	.04	.00	.07	.00	-.02	.03	.04	.28**
20 Activated Negative Affect	2.39	0.94	-.02	.07	-.02	-.09	-.10	-.09	-.01	.01	.06	-.08	.08	-.04	.19**	-.04
21 Deactivated Positive Affect	2.70	0.70	.03	.10	.05	-.12	.05	.15*	.14	-.08	-.01	.07	-.02	.10	-.16*	-.02
22 Deactivated Negative Affect	1.91	0.85	-.01	.04	.04	-.06	.01	-.06	-.08	-.03	-.03	-.03	.06	-.05	.15*	-.23**
23 Cognitive Flexibility	3.65	0.62	-.04	.09	-.08	.24**	-.14*	.10	.06	.03	.02	.06	-.13	.07	.08	.26**
24 Cognitive Persistence	3.74	0.67	-.01	.03	-.08	.15*	-.08	.13	-.05	.06	-.03	-.06	-.14*	-.07	-.04	.16*
25 Cognitive Demotivation	2.29	0.77	.07	-.05	.07	-.19**	-.04	-.06	-.16*	-.13	.00	-.15*	.19**	-.12	.17*	-.09
26 Radical Creativity	3.04	0.74	-.01	.18**	-.04	.04	-.08	.11	.09	-.15*	-.04	.09	-.12	.13	.11	.08
27 Incremental Creativity	3.30	0.71	.01	.17*	-.01	.15*	-.08	-.03	.13	-.08	.06	.15*	-.08	.19**	.12	.01
28 Creative Disengagement	2.56	0.74	.11	-.05	.02	-.16*	.12	.12	.16*	.19**	.12	.12	.16*	.04	-.15*	-.16*

Note. N = 398. * $p < .05$, ** $p < .01$. a: 1 = male, 0 = female. b: 1 = clerical function, 0 = others.

Table 2. Means, Standard Deviations, Correlations for Variables (2/2)

	M	SD	15	16	17	18	19	20	21	22	23	24	25	26	27
1 Leader Gender ^a	0.69	0.46													
2 Leader Age	43.45	6.07													
3 Leader Function (dummy)	0.52	0.50													
4 Manufacturing (dummy)	0.24	0.42													
5 IT/Programming (dummy)	0.21	0.41													
6 Gender ^a	0.40	0.49													
7 Age	33.55	5.80													
8 Team Tenure	25.88	26.88													
9 Company Tenure	39.93	40.85													
10 Total Tenure	91.36	60.96													
11 Function (dummy) ^b	0.45	0.50													
12 Hierarchical Level	2.03	1.05													
13 Social Comparison Orientation	2.98	0.80													
14 Upward Social Comparison	3.28	0.69													
15 Creative Requirement	3.83	0.55													
16 Resources for Creativity	2.96	0.56	.16**												
17 Relevance for Creativity	3.85	0.81	.50**	.17**											
18 Perceived Attainability	3.93	0.65	.20**	.01	.49**										
19 Activated Positive Affect	3.58	0.69	.15*	.16*	.31**	.28**									
20 Activated Negative Affect	2.39	0.94	.11	.00	-.09	-.17**	-.12								
21 Deactivated Positive Affect	2.70	0.70	-.02	.08	.09	.15*	.08	-.36**							
22 Deactivated Negative Affect	1.91	0.85	.03	-.19**	-.09	-.23**	-.42**	.54**	-.07						
23 Cognitive Flexibility	3.65	0.62	.20**	.10	.38**	.43**	.46**	-.28**	.10	-.34**					
24 Cognitive Persistence	3.74	0.67	.03	.11	.30**	.32**	.33**	-.26**	.10	-.31**	.54**				
25 Cognitive Demotivation	2.29	0.77	-.07	-.15*	-.20**	-.24**	-.29**	.24**	.06	.38**	-.32**	-.34**			
26 Radical Creativity	3.04	0.74	.20**	.04	.27**	.16*	.17*	-.02	.10	-.07	.23**	.14	-.14*		
27 Incremental Creativity	3.30	0.71	.16*	-.02	.18*	.10	.14	-.08	.05	-.11	.20**	.11	-.17*	.72**	
28 Creative Disengagement	2.56	0.74	-.43**	-.14*	-.36**	-.15*	-.28**	.01	.03	.07	-.38**	-.18*	.18*	-.62**	-.52**

Note. N = 398. * $p < .05$, ** $p < .01$. a: 1 = male, 0 = female. b: 1 = clerical function, 0 = others.

For the moderation analysis, I grand-mean centered all variables before entering them into the analysis to reduce the possibility of multicollinearity (Preacher, Zhang, & Zyphur, 2011; Preacher, Zyphur, & Zhang, 2010). Second, I conducted multilevel path analysis to examine key effects of the variables controlling for other independent variables. I incorporated all hypothesized paths in a single structural model, which had good fit to the current data by using CFA. Third, I performed Monte Carlo bootstrapping, which is widely believed to have high accuracy because it is based on repeated resampling for each confidence interval, to consider indirect effects and conditional indirect effects (Bauer, Preacher, & Gil, 2006). I ran SEM analyses with grand mean-centered variables and then input the unstandardized coefficients of paths, their variances and covariances, and the corresponding formula into the web-based utility developed by Tofighi and MacKinnon, (2016)¹. The significance of the hypothesized paths was estimated by 95% Monte Carlo confidence intervals.

3. Hypotheses Testing

Hypotheses 1a and 1b proposed that upward social comparison interacts with creative requirement and resources for creativity to predict individual creativity. Table 3 shows that upward social comparison has a significant interaction with resources for creativity in predicting radical creativity ($\beta=.70, p<.01$), partly supporting Hypothesis 1b. Hypotheses 2a–b proposed the moderated relationship between upward social comparison and affective reactions. Table 4 shows that the relationship between upward social comparison and deactivated negative affect is positively moderated by creative requirement ($\beta=.72, p<.05$) and negatively moderated by perceived attainability ($\beta=-.19, p<.01$), partially

¹ <https://amplab.shinyapps.io/MEDMC/>

Table 3. Multilevel Analysis Predicting Creative Outcomes

Predictors	Radical Creativity			Incremental Creativity		
	M 1	M 2	M3	M 4	M 5	M 6
<u>Level 2. Team Level</u>						
Leader Gender	-0.26	-0.25	-0.08	-0.06	-0.06	-0.31
Leader Age	0.32	0.31	0.18	0.18	0.18	0.09
Leader Education	0.13	0.12	0.08	0.26	0.26	0.21
Team Size	0.18	0.19	0.09	0.02	0.03	-0.02
Manufacturing (Dummy)	-0.32	-0.30	-0.20	0.14	0.15	0.09
IT/Programming (Dummy)	-0.28	-0.29	-0.18	-0.12	-0.12	-0.05
Creative Requirement			0.35			0.30
Resources for Creativity			-0.07			-0.01
<u>Level 1. Individual Level</u>						
Gender	0.14	0.14	0.09*	0.05	0.05	0.04
Age	*0.08	-0.04	-0.04	-0.12	-0.12	-0.08
Team Tenure	-.22*	-0.21*	-0.07*	-0.25**	-0.25**	-0.10*
Company Tenure	0.11	0.10	0.04	0.20	0.20	0.08
Total Tenure	0.08	0.07	0.07	0.08	0.08	0.07
Function	-0.04	-0.03	-0.01	-0.02	-0.02	0.00
Hierarchical Level	0.08	0.07	0.00	0.18	0.17	0.06
Social Comparison Orientation	0.13	0.13	0.07	0.15*	0.15	0.10*
Upward Social Comparison (USC)		0.03	-0.09		0.00	-0.02
USC*Requirement			0.28			-0.01
USC*Resources			0.70**			0.53
Ind-lv Variance (σ^2)	0.900	0.893	0.824	0.883	0.879	0.817
Change in Variance ($\Delta\sigma^2$)		0.007	0.076		0.004	0.066
Proportion of Explained Variance (%)		0.8%	8.4%		0.5%	7.5%

Note. Employee-level N = 306, Team-level N = 80, * $p < .05$; ** $p < .01$

supporting the hypotheses. Interaction plots in Figure 9 (Aiken & West 1991) show that when employees perceive they can compare with others' superior performance, their deactivated negative emotional reaction is even more reduced. The relationship between upward social comparison and negative activated affect is marginally moderated by creative requirement ($\beta=.43$, $p<.1$). When creativity is highly required in a team, employees react negatively toward upward social comparison.

I conducted a multilevel structural path analysis allowing all parameters simultaneously for all variables except moderators to examine the relationships between affective reactions and cognitive processes proposed in Hypotheses 3a–c. Figure 10 shows the standardized results of this analysis. This model provided an acceptable fit to the data. As expected, activated positive emotion is positively related with cognitive flexibility ($\beta=.38, p<.001$), supporting Hypothesis 3a. In addition, activated positive affect is positively related to cognitive persistence ($\beta=.28, p<.001$) and negatively related to cognitive demotivation ($\beta=-.15, p<.10$). Activated negative affect is negatively related to cognitive flexibility ($\beta=-.22, p<.01$) and cognitive persistence ($\beta=-.18, p<.05$), rejecting Hypothesis 3b. Hypothesis 3c expected that deactivated positive and negative affects are positively related to cognitive demotivation. The result partially supports this hypothesis because deactivated positive affect is not significantly related to cognitive demotivation, and deactivated negative affect shows a marginally significant relationship ($\beta=.24, p<.10$).

Hypotheses 5a–c proposed the relationship between cognitive processes and creative outcome. Figure 10 depicts that cognitive flexibility is positively related to radical creativity ($\beta=.18, p<.01$), supporting Hypothesis 5a. In addition, cognitive flexibility shows a positive relationship with incremental creativity ($\beta=.15, p<.05$) and a negative relationship with creative disengagement ($\beta=-.34, p<.001$). Cognitive persistence is not significantly related to creative outcomes, rejecting Hypothesis 5b. Cognitive demotivation is not significantly related to creative disengagement, rejecting Hypothesis 5c. However, cognitive demotivation is negatively related to incremental creativity ($\beta=-.16, p<.05$).

Table 4 Results of Moderation Analyses Predicting Affective Reactions (1/2)

Predictors	Activated Positive Affect						Activated Negative Affect					
	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12
<u>Level 2. Team Level</u>												
Leader Gender	0.40+	0.47*	.42+	.37+	0.34	0.22	-0.16	-0.20	-0.17	-0.15	-0.12	-0.34
Leader Age	-0.16	-0.16	-0.16	0.17	-0.18	-0.11	0.37	.37*	.39+	0.37	.35+	0.24
Leader Function	-0.14	-0.08	-0.06	-0.1	-0.08	-0.05	-0.22	-0.21	-0.21	-0.21	-0.24	-0.15
Manufacturing (Dummy)	0.44*	0.46*	.40+	.38*	0.31+	0.22	-0.52*	-.51*	-.48*	-0.48*	-.34+	-0.24+
IT/Programming (Dummy)	-0.20	-0.17	-0.16	-0.17	-0.14	-0.08	-0.37*	-.37*	-.36*	-0.37*	-0.13	-0.11
Creative Requirement					0.11	0.03					0.27	0.20
Resources for Creativity					0.21	0.15					-0.09	-0.13
<u>Level 1. Individual Level</u>												
Gender	0.11	0.09	0.06	0.07	0.05	0.03	-0.08	-0.08	-0.07	-0.09	-.15+	-0.07+
Age	-0.02	0.00	0.02	0.04	0.17	0.08	0.09	0.08	0.11	0.11	0.19	0.06
Team Tenure	0.12	0.10	0.08	0.09	0.05	0.04**	-0.01	-0.01	0.01	0.02	-0.02	-0.02
Company Tenure	-0.05	-0.05	-0.07	-0.08	0.02	-0.00**	0.01	0.01	0.01	0.01	0.05	0.04
Total Tenure	0.04	0.04	0.04	0.02	-0.10	-0.03**	-0.17	-0.17	-0.17	-0.18	-.30*	-0.17*
Function	0.06	0.06	0.09	0.09	0.05	0.02	0.08	0.08	0.09	0.07	0.09	0.02
Hierarchical Level	-0.04	-0.03	-0.03	-0.02	-0.08	-0.04	0.03	0.03	0.01	0.02	0.07	0.06
Social Comparison Orientation	-0.03	-0.02	-0.05	-0.04	0.00	-0.01	0.12*	.11*	.15*	0.14*	.19*	0.14**
Upward Social Comparison		0.24**	0.22	.11+	.20*	0.186		-0.07	-0.06	-0.04	-0.08	-0.11
Relevance for Creativity			0.13	.16+					-0.02	-0.04		
Perceived Attainability			0.10	0.08					-.16+	-0.12		
USC*Relevance				0.03						0.06		
USC*Attainability				0.05						-0.13		
USC*Requirement						-0.58						0.43+
USC*Resources						-0.09						0.02
Ind-level Variance σ^2	0.982	0.926	0.888	0.918	0.876	0.855	0.962	0.958	0.925	0.921	0.865	0.759
Change in Variance $\Delta\sigma^2$		0.056	0.094	0.064	0.106	0.127		0.004	0.037	0.041	0.097	0.203
Proportion of Explained Variance (%)		5.7%	9.6%	6.5%	10.8%	12.9%		0.4%	3.8%	4.3%	10.1%	21.1%

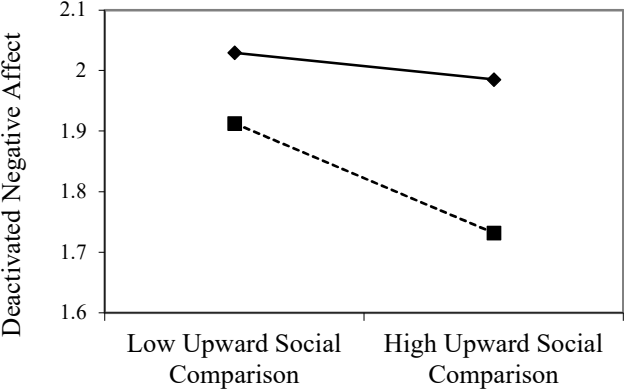
Note. + $p < .1$, * $p < .05$, ** $p < .01$

Table 4 Results of Moderation Analyses Predicting Affective Reactions (2/2)

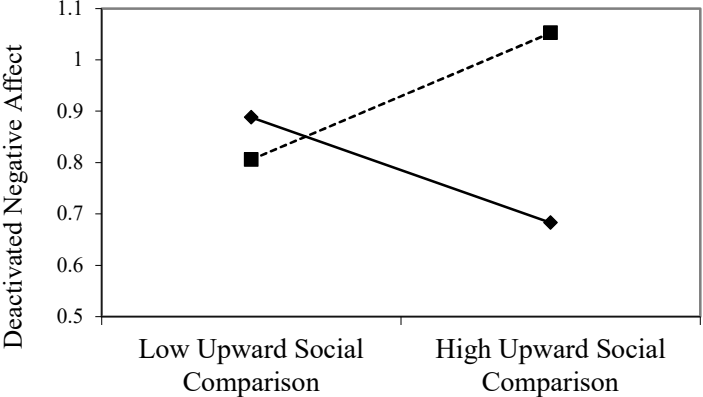
Predictors	Deactivated Positive Affect						Deactivated Negative Affect					
	M 13	M 14	M 15	M 16	M 17	M 18	M 19	M 20	M 21	M 22	M 23	M 24
Level 2. Team Level												
Leader Gender	-.64*	-0.64*	-.60*	-.59*	-.41+	-0.28	-0.23	-0.28	-0.28	-0.23	-0.26	-0.13
Leader Age	.66*	0.66*	.63*	.63*	0.35	0.20	0.245	0.24	0.25	0.21	0.30	0.17
Leader Function	0.35	0.35	0.32	0.31	0.39	0.29	0.18	0.10	0.06	0.13	0.17	0.11
Manufacturing (Dummy)	-.59*	-0.59*	.52*	.51*	-.38*	-0.26	-0.23	-0.20	-0.16	-0.18	-0.18	-0.12
IT/Programming (Dummy)	0.27	0.27	0.25	0.27	0.06	0.05	0.09	0.02	0.02	0.05	0.14	0.08
Creative Requirement					0.02	0.04					0.33	0.27
Resources for Creativity					0.32	0.39					-.44+	-0.40+
Level 1. Individual Level												
Gender	0.03	0.03	0.03	0.03	0.07	0.05	-0.08	-0.07	-0.06	-0.09	-0.07	-0.04
Age	-0.06	-0.06	-0.11	-0.09	0.19	0.11	-0.08	-0.09	-0.06	-0.08	-0.19	-0.09
Team Tenure	-.13*	-0.13*	-0.11	-0.11+	-0.1	-0.07	-0.11	-0.09	-0.07	-0.05	-0.07	-0.04
Company Tenure	0.09	0.09	0.09	0.09	0.08	0.04	0.15*	.15*	0.12	.13*	0.05	0.05
Total Tenure	0.07	0.07	0.03	0.02	-0.15	-0.10	0.00	-0.01	0.16	0.01	0.11	0.02
Function	-0.14*	-0.14*	-.15+	-0.14	-.18+	-0.05	-0.05	-0.05	-0.09	-0.12	0	-0.01
Hierarchical Level	0.01	0.01	0.08	0.09	0.001	0.01	0.06	0.06	0.00	0.00	0.09	0.03
Social Comparison Orientation	-0.09	-0.09	-.13+	-0.12	-0.11	-0.08	0.17*	0.17*	.21**	0.19*	.16*	0.12*
Upward Social Comparison		0.007	0.00	-0.04	-0.05	-0.06			-.23**	-.24**	-0.14*	-.20**
Relevance for Creativity			-0.03	-0.01					0.09	0.06		
Perceived Attainability			.20+	0.19+					.28**	-.22**		
USC*Relevance				0.02						0.07		
USC*Attainability				0.05						-.19**		
USC*Requirement						0.33						0.72*
USC*Resources						-0.29						-0.09
Ind-level Variance σ^2	0.956	0.956	0.912	0.912	0.874	0.844	0.955	0.903	0.821	0.832	0.841	0.780
Change in Variance $\Delta\sigma^2$		0.000	0.044	0.044	0.082	0.112		0.052	0.134	0.123	0.114	0.175
Proportion of Explained Variance (%)		0.0%	4.6%	4.6%	8.6%	11.7%		5.4%	14.0%	12.9%	11.9%	18.3%

Note. + $p < .1$, * $p < .05$, ** $p < .01$

Figure 9 Interaction between Upward Social Comparison and Team Context on Affective Reactions

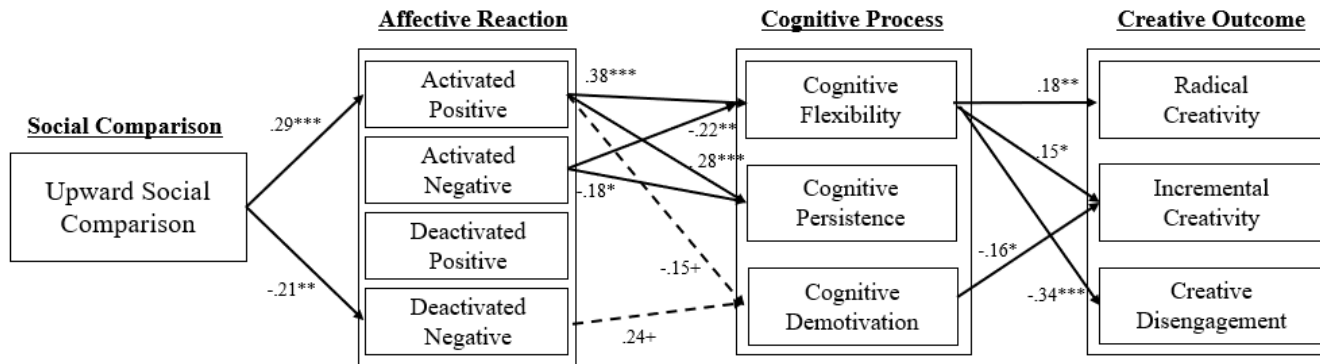


—◆— Low Perceived Attainability - -■- - High Perceived Attainability



—◆— Low Creative Requirement - -■- - High Creative Requirement

Figure 10 Results of the Main Effect Model



Note. N=306, Dashed lines are $p < .1$, $\chi^2(71)=104.12$, $p < .01$, RMSEA=.04, CFI=.95, TLI=.91, SRMR=.06

This result agrees with Hypothesis 5c, which suggests negative effect of cognitive demotivation on creativity.

I tested the indirect effect of upward social comparison on cognitive processes through affective reactions by employing a Monte Carlo bootstrapping method, producing unbiased indirect effect estimate with 95% confidence interval (Preacher & Hayes, 2008). Table 5 shows that, through activated positive affect, upward social comparison has indirect effect on cognitive flexibility (indirect effect unstandardized estimate [b_{ind}]=.101, CI [.041, .177]), cognitive persistence (b_{ind} =.083, CI [.031, .146]), and cognitive demotivation (b_{ind} =-.051, CI [-.114, -.0001]). Thus, only Hypothesis 4a was supported, and Hypothesis 4b, 4c, and 4d were rejected.

Table 5 Indirect Effect Using Monte Carlo Confidence Intervals (1)

Independent variable	Mediator	Dependent variable	Unstd. estimate (<i>b</i>)	95% LLCI ^a	95% ULCI ^a
Upward Social Comparison	Activated Positive Affect	Cognitive Flexibility	0.101*	0.041	0.177
		Cognitive Persistence	0.083*	0.031	0.146
		Cognitive Demotivation	-0.051*	-0.114	-0.0001

Note. N= 301; Unstd. = Unstandardized; LLCI = Lower limit confidence interval; ULCI = Upper limit confidence interval. a These values are calculated on the basis of the unstandardized path coefficients by using Monte Carlo simulation. * 95% confidence interval excludes zero.

In addition, I calculated the indirect effect of affective reactions on creativity through cognitive processes. Table 6 reports through its direct effect on cognitive flexibility that activated positive affect has indirect effect on radical creativity (b_{ind} =.079, CI [.018, .158]), incremental creativity (b_{ind} =.063, CI [.002, .141]), and creative disengagement (b_{ind} =-.147, CI [-.254, -.062]). Through cognitive flexibility, activated negative affect has indirect effect on radical creativity (b_{ind} =-.032, CI [-.075, -.004]), incremental creativity (b_{ind} =-.027, CI [-.070, -.0001]), and creative disengagement (b_{ind} =.059, CI [.012, .121]).

Table 6 Indirect Effect Using Monte Carlo Confidence Intervals (2)

Independent variable	Mediator	Dependent variable	Unstd. estimate (<i>b</i>)	95% LLCI ^a	95% ULCI ^a
Activated Positive Affect	Cognitive Flexibility	Radical Creativity	0.079*	0.018	0.158
		Incremental Creativity	0.063*	0.002	0.141
		Creative Disengagement	-0.147*	-0.254	-0.062
Activated Negative Affect	Cognitive Flexibility	Radical Creativity	-0.032*	-0.075	-0.004
		Incremental Creativity	-0.027*	-0.070	-0.0001
		Creative Disengagement	0.059*	0.012	0.121

Note. N= 301; Unstd. = Unstandardized; LLCI = Lower limit confidence interval; ULCI = Upper limit confidence interval. ^a These values are calculated based on the unstandardized path coefficients by using Monte Carlo simulation. * 95% confidence interval excludes zero.

I also tested conditional indirect effect of creative requirement and creativity resources on the relationship between upward social comparison and cognitive processes through affective reactions. I computed Monte Carlo confidence interval analysis with 5,000 times bootstrapping for all possible paths, but Table 7 shows no significance paths.

Table 7 Moderated Mediation Effects Using Monte Carlo Confidence Intervals

Independent variable	Mediator	Dependent variable	Moderator	Moderator level	Conditional indirect effect	95% LLCI ^a	95% ULCI ^a
Upward Social Comparison	Deactivated Negative Affect	Cognitive Flexibility	Creative Requirement	High (+1SD)	-.141	-.824	.194
				Low (-1SD)	.477	-.070	1.529
				Difference	.597	.006	1.188
			Support for Creativity	High (+1SD)	.192	-.279	.718
				Low (-1SD)	.142	-.220	.813
				Difference	-.196	-.796	.407
Upward Social Comparison	Deactivated Negative Affect	Cognitive Persistence	Creative Requirement	High (+1SD)	-.125	-.836	.263
				Low (-1SD)	.493	-.075	1.610
				Difference	.594	.004	1.186
			Support for Creativity	High (+1SD)	.209	-.298	.796
				Low (-1SD)	.159	-.249	.902
				Difference	-.196	-.795	.406

Note. Bootstrap sample size = 5,000. LLCI = lower limit confidence interval; ULCI = upper limit confidence interval.

CHAPTER 6. DISCUSSION

Summary of Findings

This study was developed to extend and enhance our understanding of team dynamics in relation to creativity from a social cognitive perspective by providing a new framework connecting upward social comparison and creative outcomes. The main argument is that upward social comparison is related to employee creativity through an emotional and cognitive process. Thus, I developed the framework to predict three types of creative outcomes, namely, radical creativity, incremental creativity, and creative disengagement. I combined four aspects of emotions, namely, activated positive emotion, activated negative emotion, deactivated positive emotion, and deactivated negative emotion, and three types of cognitive reactions, namely, cognitive flexibility, cognitive persistence, and cognitive demotivation, on the basis of the dual pathway model (De Dreu et al., 2008).

Upward social comparison shows consistent positive effects on team members' affective reaction. The hypothesized relationship that the affected reactions will be determined by organizational context is not supported. Upward social comparison is positively related to activated positive emotion and negatively related to deactivated negative emotion. Considering that deactivated negative emotion is located on the diagonally opposite side of the circumplex, upward social comparison has emotionally positive and elevating effects for team members.

The findings reveal that affective reactions to upward social comparison are related to cognitive processes. Activated positive emotion is positively related to cognitive flexibility and cognitive persistence but negatively related to cognitive demotivation. By contrast, activated negative emotion is positively related to cognitive demotivation but negatively related to cognitive flexibility and cognitive persistence. The results also reveal

that cognitive flexibility is positively related to radical and incremental creativity and negatively related to creative disengagement. However, cognitive persistence is not significantly related to incremental creativity. As hypothesized, deactivated positive emotion is related to cognitive demotivation, which, in turn, is negatively related to radical and incremental creativity but positively related to creative disengagement. The results have interesting implications for creativity researchers because theories of dual pathway model and previous empirical studies based on laboratory experiments typically argued that activated positive emotion is related to creativity through cognitive flexibility, whereas activated negative emotion is related to creativity via cognitive persistence. The findings suggest that in actual organizational teams, the effect of activated negative emotion may turn out differently, which is a unique contribution of this study.

Implications on Creativity Literature

This work significantly contributes to the creativity literature in several ways. The major contribution of this study is the introduction of a well-established social psychological theory of social comparison to organizational creativity literature. In previous creativity literature, a person–situation interactionist view was dominantly used to explain creativity (e.g., Choi, 2004a; Oldham & Cummings, 1996; Shalley et al., 2004). Extant studies considered individuals as independent entities and focused on within-individual process. This stream of studies tended to examine individual characteristics or environmental factors that motivate individuals to be creative. What has been largely neglected is that man is a social animal, as Aristotle said. With increasing dependence on team systems in contemporary organizations, the importance of inter-member dynamics in creativity research has gained recent interest. According to Perry-Smith and Mannucci (2017, p. 53), “the notion that creativity is a social process has increasingly gained

prominence.” As creativity is known to be affected by social relationships with others in the work community (Amabile, 1988; Woodman, Sawyer, & Griffin, 1993), many attempts have been made (e.g., Rouge, 2018; Perry-Smith & Mannucci, 2017; Ma, 2009; Perry-Smith & Shalley, 2003) to capture the social aspects of creativity. Unfortunately, these attempts neglected to explain social cognitive aspects of creativity, wherein people can acquire knowledge and change their behaviors by observing others without direct interactions with others, such as social exchange or feedback. Moreover, research that addressed social relationships between members in organizational teams in relation to creativity was limited to diversity (S. J. Shin et al., 2012). Considering that people have a constant innate drive to make social comparison with others (Festinger, 1954), it is crucial to examine social comparison processes in studying creativity in organizational team settings. The current study successfully adopted social comparison theory to examine the effects of social relationships between team members and to examine the neglected area of research.

This study expanded and contributed to the recent trends of investigating the multifaceted nature of creativity by providing distinctive preceding mechanisms for three different types of creativity, namely, radical and incremental creativity and creative disengagement (Sternberg, 1999; Sung et al., 2011). Although radical and incremental creativity are important to organizations, they must be differentially managed because one focuses on prosperity and growth of the firm, whereas the other focuses on survival and continuance of an organization. I introduced creative disengagement, which refers to one’s withdrawal of time and effort from engaging in creative behaviors. I then elaborated a comprehensive model examining differential mediating paths connecting social comparison and different types of creativity to denote the lowest level of creativity

engagement. My findings suggest that affective reactions to social comparison affect different types of creativity through different cognitive processes. This study successfully suggested cognitive demotivation as a possible inhibitor of creativity because the result shows that cognitively demotivated individuals disengage from creativity. I extended the literature by providing a fine-grained analysis of affective and cognitive processes and creativity. Moreover, going beyond extant studies that compare creative performance with routine, noncreative work (Madjar, Greenberg, & Chen 2011), my study offered a unique contribution by presenting a pure comparison within the creative performance dimension.

The current study provided a new framework for understanding social aspects of creativity in organizational teams by enlightening the intermediate process connecting social comparison and creativity. This study successfully presented cognitive demotivation as a possible inhibitor of creativity while integrating emotional and cognitive processes.

Implications on Social Comparison Literature

The current research made significant contributions to social comparison literature.

1. Revealed positive effects of upward social comparison in organizational teams

First, this study remarkably revealed that upward social comparison has distinct and stable positive emotional reactions in organizational team settings. Early studies suggested that downward comparison improves self-esteem and subjective well-being and generates a positive affect (Wills, 1981). In contrast, upward comparison was supposed to diminish self-esteem and generate a negative affect, such as envy, anger, and resentment (Alicke & Zell, 2008; Buunk & Gibbons, 2000; Gibbons & Gerrard, 1989; Wood, 1989). Researchers then found that reactions to upward comparison may either be positive or negative depending on situational factors (Buunk, Collins, Taylor, Vanperen, & Dakof, 1990; J. P. Gerber et al., 2018; Richard H. Smith, 2000). For example, Smith (2000) and Buunk et al.

(2005) showed that upward comparison can have positive and negative effects depending on several dimensions, such as perceived control and desirability of comparison results. A recent meta-analysis commented that negative reactions toward upward social comparison are dominant, especially when ability estimates are concerned (J. P. Gerber, Wheeler, & Suls, 2017). Thus, negative reactions can be expected for social comparison of creative ability, depending on contingency factors. Unlike previous literature, the results of the current study demonstrate consistent positive reactions to upward social comparison, which is an encouraging finding.

Possible explanation 1. Task characteristics of organizational teams

Several possible reasons can explain this surprising result. First, this gap may be due to the difference in the task characteristics in the study design of this study, which is explicitly based on empirical data collected from organizational team workers. Most previous research was based on experimental studies, where social comparison is made on independent tasks. For this sample, I collected multi-wave data from 80 teams in over 10 organizations with diverse backgrounds. In contemporary organizations, members from the same team usually work in reciprocal interdependence, especially when in knowledge-dependent or creative jobs (Baruah & Paulus, 2009; Pee, Kankanhalli, & Kim, 2010; Thompson, 1967). Unlike jobs with pooled interdependence where members work and contribute independently, those with reciprocal interdependence need mutual adjustment between members. Therefore, the outcome of one member is closely correlated with that of other members when they are reciprocally interdependent. (In addition, team members cooperate with coworkers to achieve a common goal because an organizational team shares a common goal among its members.) Given that the accomplishment of one's task depends not only on independent accomplishment but also on coordination among team members,

the superb ability of coworkers can be interpreted as a helpful or profitable asset to one's performance, leading to positive affective reactions. By contrast, experimental participants must make comparisons with others on manipulated tasks, which are independent than interdependent. Considering that the negative or mixed results of upward social comparison were mostly based on experimental studies, reactions to upward social comparison of coworkers' creative ability in actual organizational teams turned out positive.

Possible explanation 2. Relational characteristics of organizational teams

In addition to the task characteristics discussed above, I also suggested that relational characteristics within organizational teams explain the study result. In experimental studies that most previous social comparison studies have pursued, participants tend to have very short-term relationships with comparison targets on a one-off task. Moreover, the majority of experimental studies have undergraduate students, who are used to having good grades when they outperform others and having lower grades when classmates make superior performance, as participants. In such cases, superior performances of comparison targets tend to be construed as impediments to good performance of the focal person because other participants are mere objects of comparison. Thus, participants to experimental studies tend to react negatively to counterparts' good performance, especially when ability is concerned.

By contrast, organizational team members share a long history of working together because most teams last for months to years. Considering that team longevity is related to trust among members, the participants of the current study (team tenure mean=26 months) should believe in benevolence and integrity of team members, which are two of three characteristics of a trustee that determine trustworthiness (Mayer, Davis, & Schoorman,

1995): ability, benevolence, and integrity. Organizational team members tend to have a higher level of trust among themselves, especially benevolence and integrity (compared with experimental participants) (J. K. Wang, Ashleigh, & Meyer, 2006). As one of the core characteristics of trustworthy people, ability captures “the knowledge and skills needed to do a specific job along with the interpersonal skills and general wisdom needed to succeed in an organization” (Colquitt, Scott, & LePine, 2007: p. 910). The perceived ability of coworkers may add up to benevolence and integrity to improve the level of trustworthiness upon members. Trustworthiness increases positive expectations on trustee and people tend to feel positive emotions, such as happiness and relaxation, when coworkers are trustworthy. This situation is more likely considering the cooperative culture in Asian companies.

In organizations where most jobs are executed as a team, if an employee believes that coworkers can generate creative ideas, he/she will have higher expectancy that her/his own efforts will be related to creative performance (Vroom, 1964). Employees will be motivated to engage in creative performance and be enthusiastic and excited when they expect legitimate return for their effort. This relationship is supported by the positive relationship between collective efficacy belief and team positive affect (Hong & Lee, 2013; Riggs & Knight, 1994), which shows positive emotional reactions to team members’ ability to successfully perform tasks. In addition, working with coworkers who are full of new ideas and creative solutions is generally more fun; thus, positive emotion is expected. The perception that coworkers have better creative ability implies that the focal person observed and experienced sharing of such creative ideas. In such cases, he/she perceives he has coworkers who can be a great asset to her/himself and make positive affective

reactions.

2. Expanded the application of social comparison theory to creativity literature

Second, this study contributed to the social comparison literature by expanding the application of social comparison theory to creativity literature. By depicting the distinct effect of upward social comparison on emotion, cognition, and creativity in organizational team situations, this study asserted the importance of understanding social comparison dynamics in organizational teams. The possible effect of social comparison on creativity has been investigated in various studies in several literatures, including studies relating social comparison and brainstorming productivity (Dugosh & Paulus, 2005; Michinov & Primois, 2005) and those on the effects of implied social comparison (e.g., competition) on individual creativity (Conti et al., 2001). Existing studies have demonstrated plausible social comparison effect on creativity, but the application of social comparison theory on creativity in organizational behavior literature has been limited (Greenberg et al., 2007). As work teams have become the most essential source of creativity in organizations, the effects of team dynamics on creativity can be understood by social comparison theory. This study provided theoretical ground to investigate creativity from the lens of social comparison theory through the establishment of a new framework.

Implications to Emotion–Cognition Literature

This study also contributed to emotion–cognition literature. In line with recent developments in emotional research across various disciplines, I adopted the circumplex model of emotions to investigate the affective reactions to social comparison. At present, most studies on creativity empirically viewed individual emotions through the lens of positive/negative affectivity or discrete emotions (Baas et al., 2008). However, recent studies from diverse disciplines highlighted the empirical and heuristic limitations of the

discrete emotion model and argued that researchers must shift to the dimensional approach (A. J. Gerber et al., 2008). Answering the calls to shift to dimensional approach, which is found to better explain individual emotions (Eerola & Vuoskoski, 2011; Gu et al., 2018), I adopted a 2D model of emotions with valence and activation as its two axes and empirically validated the model as a mediating mechanism connecting social comparison and creativity.

Another core contribution of this study is that it verified the differential effect of emotional valence in the organizational team setting. This study was theoretically built upon dual pathway model (De Dreu et al., 2008) and empirically validated with field data. Dual pathway model explained individual creativity with emotion and cognition, asserting that once activated, positive valence leads to cognitive flexibility, negative valence leads to cognitive persistence, and both cognitive processes are related to creativity (De Dreu et al., 2008). The results confirm the importance of activation level by showing that deactivated individuals are cognitively demotivated to show reduced creativity. With a multi-wave multi-source data collected from diverse organizational teams, this study discovers that once activated, positive emotion engenders cognitive flexibility and persistence, whereas negative emotion exhibits opposite relationships. These findings agree with the established literature, which suggests that positive emotion is related to creativity because it promotes loose and heuristic information processing (Forgas, 1995), whereas negative emotion reduces attentional focus and makes people stick to established strategies (Baumann & Kuhl, 2002; Vosburg, 1998). According to dual pathway model and a school of studies, negative emotion may lead to creativity because it enables people to persevere in their cognitive efforts in systematic thinking (De Dreu et al., 2008; Rietzschel et al., 2007). The current study showed that only positive emotion is related to cognitively

motivated state of employees (i.e., cognitive flexibility and cognitive persistence). The findings of the current research challenge the dual pathway model in organizational team settings. I speculated that dual pathway model could be modified for team settings for several reasons. First, unlike experimental tasks or individually performed tasks, employees working in organizational teams on creative tasks tend to be in an interdependent relationship (Cooke et al., 2003). Therefore, a team worker needs a tacit consent and collaborative climate from coworkers to spend a long time on a certain problem until it is solved because his/her work is related to that of other team members (Fleming & Monda-Amaya, 2001). Therefore, unlike individuals who may react to negative emotion with exertion of more effort, a team employee may become cognitively persistent only when she/he feels positive affects. Second, when an employee feels negative emotion while working with team members, the person tends to take it as a signal that something is wrong in the working team (Ambady & Gray, 2002; Fiedler, 1988). This negative signal induces the focal person to become risk averse and stick to existing strategy and simple tasks rather than challenge and endeavor efforts to difficult problems because his/her work is correlated with that of team members (Baumann & Kuhl, 2002). Overall, these findings reveal the different emotion–cognitive reactions in organizational teams.

Finally, this study expanded the research scope of emotion–cognition theories and contributes empirically by providing a process model connecting social comparison and creativity. The results exhibit the dominant role of cognitive flexibility in relation to creativity. The findings show that cognitive flexibility increases radical and incremental creativity and significantly decreases creative disengagement, whereas cognitive persistence has no significant effect on three types of creative outcomes. The results suggest that flexible cognitive attitude is required to gain unique and useful ideas (Lin,

Tsai, Lin, & Chen, 2014).

Practical Implications

This study offered several valuable practical implications that are relevant to organizational managers who want to encourage employee creativity within their team systems. The creativity of employees working in team systems is influenced by social interactions among team members. Consistent positive reactions to upward social comparison suggest that employees prefer being a member of a strong team to being a strong individual in a group of weak members. Perception of one's membership in a team of high potency increases activated positive affect, which leads to cognitive flexibility. Thus, leaders should play an active role in directly and indirectly encouraging employees to believe that they belong to a strong team and have pride in their team membership. Leaders and members should pay attention to fostering mutual respect and honor between team members to promote positive perceptions toward their team. Managers may consider formulating teams with members with high creative ability such that capable employees interact to make creative outcomes.

Managers should be aware that negative emotion is related to lower level of cognitive motivation, which leads to disengagement in creativity. Unlike people assigned with individual tasks who abandon substantial cognitive efforts when feeling negative emotions, people working in teams perceive negative emotion as a negative sign where s/he should reduce risk-taking behaviors. Efforts to reduce negative emotion among team members regardless of activation level will improve individual creativity in work teams.

Top management and managers of organizations that require creativity must attempt to improve the cognitive flexibility of their employees. In these organizations, employees with high cognitive flexibility may deliver set-breaking ideas that are needed for

organizational success. Managers must maintain activated positive emotional states and reduce activated negative emotion of their employees to improve the flexible thinking of employees. Management may also consider providing a working environment that enables association of remote ideas from different departments or teams, for example by creating a mingling area or communication activities.

Limitations and Future Research Directions

This study revealed several intriguing questions that merit further investigation. The results of the current study show team members' consistent positive reactions to upward social comparison. The participants of this study are relatively young (33 years old) and have lower-level function (41.5% are staff), and these characteristics may have influenced positive affective reactions to upward social comparison. For example, a new staff who is not familiar with the job and a manager who should be skilled at work may have different emotional reactions when team members show superb performance. Future studies may consider the possible effect of relative rank of a focal person (i.e., rank of the focal participant versus average rank of team members) on upward social comparison. Moreover, the consistent positive reactions toward upward social comparison may turn out differently in organizations where team members are in pooled interdependence, where each member performs his/her task independently (Baruah & Paulus 2009). In such cases, individuals may consider comparison with others as counterparts of competition rather than coworkers in a cooperative relationship. Empirically investigating and comparing the contingency effects of different levels of task interdependence and the effects of individual-based/team-based reward will be a meaningful stretch of the current research.

The current study revealed that social comparison perception influences affective, motivational, and cognitive reactions in organizational team setting. Despite the plausible

applicability of social comparison theory in diverse individual attitude and behaviors in organizational teams, few attempts have been made to apply this theory to understanding the effects of social relationships on organizational behaviors. Thus, the social comparison literature may benefit from examining the possible effects of social comparison perceptions on other team-related outcomes in organizations.

The current study adopted direct measurement of upward social comparison by asking participants to compare their creative ability with coworkers'. This approach is legitimate considering that perceived measurement is the most proximal determinant of actual attitudes and behavior of individuals (Cable & DeRue, 2002; Kristof-Brown, Zimmerman, & Johnson, 2005). However, social comparison literature may benefit from investigating the indirect measurements of social comparison, such as comparing one's creative ability that is measured by the focal participant and coworkers, which may be relatively free from social desirability. Social comparison measurements provided from external sources, such as leader feedback or personnel evaluation scores may be used to further reduce the effects of social desirability or emotions and investigate the effects of "upward social comparison state;" it may also enrich our understanding of social comparison reactions.

This study revealed distinctive characteristics of work teams in the process leading to creativity. Unlike dual pathway model, which poses cognitive flexibility and persistence from positive and negative activated emotions as two predictors of creativity, the results from this dissertation exhibits that activated positive emotion is important for employee creativity in organizational teams. In classic studies, it was argued that negative emotion has positive effects on individual performance, as first suggested by Alloy and Abramson's prominent experiment of "sadder but wiser" students in 1979. However, the result of this research agrees with the notion of "happier and smarter" (Chuang, 2007; Staw & Barsade,

1993) and the positive role of activated and positive affects on work motivation in Seo et al.'s model (Seo & Barrett, 2007; Seo, Bartunek, & Barrett, 2010). Future studies may reinvestigate dual pathway model and further enlighten the role of activated positive emotions in relation to creativity.

Despite increasing interest on the social aspect of creativity, the consideration of social aspect within creativity is lacking. Creativity studied in previous studies was concerned with making new and useful ideas within a single person. Only "team creativity" as a measurement of creative outcomes of a single team (Sung & Choi, 2012) was considered even in team contexts. In organizational teams, where continuous interactions between members are important, the type of people who can generate creativity by facilitating others plays a great role. Future researchers should differentiate types of people who contribute to team creativity by making creative ideas alone or those who generate creative ideas by facilitating others.

CONCLUSION

This study is an important step to introduce social comparison influence to examine individual creativity. In the examination of its relationship with diverse types of creativity through emotion and cognition, the results reveal interesting reactions to upward social comparison, reflecting the unique characteristics of organizational team settings. In organizational teams where members share a long-term history of working together, upward social comparison with coworkers results in positive emotions. The largely positive reactions to upward comparison are strengthened when employees perceive high attainability but weakened when creative requirement is high. Positive reactions to upward social comparison are positively related to radical and incremental creativity through

cognitive flexibility. In contrast, activated negative affect is negatively related to radical and incremental creativity through cognitive flexibility and persistence. These results emphasize the importance of maintaining activated positive affect and prohibiting activated negative affect in organizations with team structure. Cognitive demotivation is detrimental to creativity, confirming the importance of cognitive motivation for creativity. The results of the current study imply that in work teams in contemporary organizations that are full of uncertainty and high risks, employees need safety and relief to be able to boldly engage in creative behaviors. Perhaps, we should now move away from “sadder but wiser” employees (Alloy & Abramson, 1979) and keep our team members “happier and smarter” (Chuang, 2007; Seo et al., 2010; Staw & Barsade, 1993).

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APPENDIX

팀원들과의 비교 (Upward Social Comparison)

(전반적 업무수행능력이 아닌) 우리팀 팀원들의 평균적인 창의성 수준을 나와 비교해볼 때...

1. 우리 팀원들은 직관적 사고력이 뛰어난 편이다.
2. 우리 팀원들은 상상력이 풍부하다.
3. 우리 팀원들은 새로운 아이디어를 잘 생각해낸다.
4. 우리 팀원들은 주어진 문제에 대해 창의적 해결책을 잘 제시한다.
5. 우리 팀원들은 전반적인 창의성이 뛰어나다.
6. 우리 팀원들은 높은 창의적 성과를 나타낸다.

창의성에 대한 업무상 요구 (Creative Requirement)

1. 내 업무는 나에게 창의성을 요구한다.
2. 내 업무는 주어진 문제에 창의적 아이디어를 제시할 것을 요구한다.
3. 내 업무는 새로운 아이디어를 생각해낼 것을 요구한다.
4. 내 업무는 주어진 현상이나 문제에 대해 다양한 관점을 필요로 한다.

창의성의 개인적 중요성 (Relevance for Creativity)

1. 창의성을 발휘하는 것은 나에게 중요하다.
2. 창의성 발현은 나의 핵심가치 중 하나이다.
3. 내가 창의성을 발휘하는 것은 이 회사에서 나의 미래에 영향을 미친다.

창의성에 대한 지원 (Support for Creativity)

1. 우리 팀은 새로운 아이디어를 생각해낼 수 있도록 충분한 자원을 제공한다.
2. 우리 팀에서 나는 새로운 해결책을 생각해 내는데 필요한 물질적 지원을 쉽게 얻을 수 있다.
3. 우리 팀은 내가 새로운 아이디어를 생각해내기에 충분한 시간적 여유를 제공한다.
4. 우리 팀에서 나는 새로운 해결방법을 개발하는데 필요한 금전적 지원을 받을 수 있다.

창의적 잠재력 (Perceived Attainability)

1. 나의 창의성은 상황에 따라 더 발현될 수 있다.
2. 나는 노력하기만 하면 창의성을 발전시킬 수 있다.
3. 나의 창의적 능력은 팀 업무환경에 따라 발전될 수 있다.
4. 나는 필요하다면 지금보다 더 큰 창의성을 발휘할 수 있다.

창의적 업무상황에서 느끼는 감정 (Affective Reactions)

지난 몇주간, 귀하가 팀에서 동료들과 업무상 문제를 해결하고 아이디어를 끌어내면서 어떤 감정을 느꼈는지를 표시하여 주십시오

나는 팀 내에서 동료들과 창의적 업무를 할 때...

(Activated Positive Affect)

- 열정적이다.
 - 영감을 얻는다.
 - 신나고 흥분된다.
-

(Deactivated Positive Affect)

- 편안하다.
- 느긋하다.
- 걱정이 없다
- 차분하다.

(Deactivated Negative Affect)

- 우울하다.
- 낙담을 한다.
- 희망이 없다.

(Activated Negative Affect)

- 불안하다.
- 긴장된다.
- 걱정된다.

유연한 업무처리 (Cognitive Flexibility)

1. 이 팀에서 나는 직면한 문제를 창의적으로 해결할 방안을 강구한다.
2. 이 팀에서 나는 문제해결을 위한 다양한 대안들을 검토하고 고려한다.
3. 이 팀에서 나는 주어진 업무 상황에 다양한 방법을 시도해본다.
4. 이 팀에서 일할 때 나는 다양한 방식으로 일을 추진한다.

지속적 업무노력 (Cognitive Persistence)

1. 이 팀에서 일할 때, 나는 시간이 오래 걸리더라도 문제의 해결책을 찾아내려고 노력한다.
2. 나는 아무리 어려운 일이라도 포기하지 않고 지속적으로 노력한다.
3. 나는 업무 상에서 도전적인 일이라도 잘 될 때까지 지속적으로 고민한다.
4. 나는 성공에 대한 불확실성이 있더라도 주어진 업무를 끝까지 시도해본다.

업무 선호도 (Cognitive Demotivation)

1. 이 팀에서 일할 때, 나는 가급적 단순한 일을 선호한다
2. 나는 이 팀에서 업무와 관련하여 쉽게 해결할 수 있는 일을 선호한다.
3. 이 팀에서 일할 때, 나는 깊은 고민없이 수행할 수 있는 업무에 집중한다.
4. 이 팀에서 일할 때, 나는 업무적으로 새로운 방식을 시도해야하는 상황은 가급적 피한다.

사회비교성향 (Social Comparison Orientation)

1. 나는 나의 성취와 다른 사람의 성취를 종종 비교하는 편이다.
 2. 나는 내가 일하는 방식과 다른 사람들이 일하는 방식을 항상 비교한다.
 3. 나는 회사에서 다른 사람들과 나의 현재 상태나 수준을 비교한다.
 4. 나는 모든 측면에서 다른 사람들과 나를 항상 비교하는 편이다.
 5. 내가 얼마나 잘했는지 알려면 내가 한 일과 다른 사람들이 한 일을 비교해야 한다.
 6. 나는 나의 사회적 능력이나 인기를 종종 다른 사람과 비교해본다.
-

다음 항목은 직원들의 창의적 성향에 대하여 파악하기 위한 것입니다. 각 팀원의 전반적 업무능력이 아닌 “창의성 측면에만 국한하여” 응답하여 주십시오.

급진적 창의성 (Radical Creativity)

1. 이 직원은 남들이 생각 못하는 창의적인 아이디어를 생각해낸다.
 2. 이 직원은 일을 할 때 상당한 정도의 독창성을 보인다.
 3. 이 직원은 일을 하는데 있어 완전히 새로운 방식을 제시한다.
-

개량적 창의성 (Incremental Creativity)

1. 이 직원은 기존 아이디어나 업무방식을 적절하게 새로운 방식으로 활용한다.
 2. 이 직원은 기존에 존재하는 아이디어를 응용하고 개량하는 데 뛰어나다.
 3. 이 직원은 기존 업무방식을 자신의 현재 필요에 맞게 개선하여 사용한다.
-

비관여적 창의성 (Creative Disengagement)

1. 이 직원은 문제해결시 전통적 방식을 고수하는 편이다.
 2. 이 직원은 새로운 아이디어 자체에 큰 관심이 없다.
 3. 이 직원은 자신의 창의성에 대한 남들의 평가를 크게 신경쓰지 않는다.
 4. 이 직원은 창의성을 발휘하는 데에 별다른 관심을 보이지 않는다.
-

Note. 5 점 척도 (전혀 그렇지 않다 - 그렇지않다 - 보통이다 - 그렇다 - 매우 그렇다)

사회비교이론 관점에서 살펴본 개인창의성:
팀내 상향비교에 대한 감정적 인지적 과정의 매개효과 및
직무창의성요구와 창의적자원의 조절효과

서울대학교 대학원
경영학과 경영학 전공
양 유 하

사회발전의 속도가 빨라지고 이에 따라 소비자들의 취향변화도 급격해지면서 사회 각계각층의 다양한 니즈를 맞추기 위하여 기업 인재들의 창의성은 기업의 존속과 성공을 위한 필수적 요소가 되었다. 특히 기술의 고도화와 정보의 홍수속에서 개인보다 팀으로 업무를 처리해야하는 일이 많아지면서, 이러한 사회적 관계속에서의 창의성에 대한 고려가 주목받고 있다.

본 연구는 그 중요성에도 불구하고 창의성 문헌에서 충분히 고려되지 못했던 사회비교이론(Festinger, 1954)을 창의성의 이중경로모델(De Dreu et al., 2008)과 결합시켜, 창의적 능력에 대한 팀원들 간의 비교가 직원 개인의 창의성에 미치는 프로세스를 새로이 밝혔다. 특히, 실제 팀 조직에서 개인들이 더욱 빈번히 경험하는 상향비교 상황에 초점을 맞추어(Gerber et al., 2018), 창의적 능력에 대한 팀원들과의 상향비교가 정서적, 인지적 반응을 통해 창의성에 도달하는 과정을 살펴보았다.

다양한 문헌에서 정서의 차원적 접근(dimensional approach)의 중요성을 강조함에 따라, 본 연구에서는 활성화(activation)와 정서가(valence) 두 가지 차원을 바탕으로 팀내 상향비교에 대한 정서적 반응을 살펴보았다. 또한, 정서에 이은 인지적 반응을 살펴봄에 있어, 이중경로모델에서 제시한 인지적

유연성, 인지적 지속성에 인지적 비동기화(cognitive demotivation)상태를 추가하였고, 이러한 정서적, 인지적 반응이 창의성의 세가지 측면, 즉 급진적 창의성, 점진적 창의성, 비관여적 창의성으로 연결되는 프로세스를 분석하였다.

한달 간격으로 팀원 및 팀장에게 2회에 걸쳐 수집한 데이터를 통해, 본 연구는 상향비교가 활성화된 긍정적 정서를 통해 인지적 활성화에 영향을 미치며, 인지적으로 유연한 상태일 때 창의성이 발휘됨을 검증했다. 본 논문은 기존에 실험연구를 통해 이론적으로 제시되었던 가설들을 발전시켜 실제 기업에서 최초로 실증 분석함으로써, 현실 기업에서의 팀내 사회적 관계가 창의성에 미치는 영향을 구체적으로 알아보았다는 점에서 의의를 가진다.

주요어: 창의성, 사회비교이론, 정서, 인지과정, 창의성의 이중경로모델

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