Unraveling the Dynamic Nature of Creativity in the Workplace

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Unraveling the Dynamic Nature of Creativity in the Workplace

by

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A THESIS
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Abstract

Recent research and theories on workplace creativity have construed workplace creativity as a dynamic process. Past research, however, largely examines the phenomenon using cross-sectional studies that are unable to test these dynamic theories of creativity. Moreover, scholars have traditionally studied the subject from a motivational perspective or from an affective state perspective. By doing so, the literature is oversimplifying and possibly distorting its understanding of workplace creativity. The primary goal of the study is two-fold: to test a dynamic theory of creativity and to integrate both a motivational and affective states model of creativity. Using daily survey data across ten days from 127 full-time employees, I found no support for a dynamic theory of creativity or integrated model of creativity. However, exploratory methods revealed that creativity is an outcome of both high activation positive affective states and goal orientations. Moreover, I found that this relationship was mediated by creative self-efficacy. Taken together, these exploratory results partially support an integrated model of creativity, albeit not being a dynamic phenomenon. Drawing from the current findings, theories and methodology are advanced towards providing a more robust test of a dynamic theory of creativity. Based on these findings, human resource practitioners are encouraged to engage in creative self-efficacy building by providing employees with feedback on their creative work. Moreover, practitioners should understand the importance of workplace affect in the role of creativity. Practitioners are encouraged to create a positive atmosphere to allow employees to express their creativity.

Keywords: goal orientations, affective states, creative self-efficacy, creativity
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Table of Contents

Abstract ................................................................................................................................. i
Acknowledgements ............................................................................................................... ii
Table of Contents ................................................................................................................. iii
List of Tables ......................................................................................................................... v
List of Figures and Illustrations ............................................................................................. vii

CHAPTER ONE: INTRODUCTION .................................................................................. 1
  1.1 Defining the Workplace Creativity Criterion Space ................................................... 5
  1.2 The Componential Theory of Creativity ................................................................... 7
  1.3 Testing a Dynamic model of Creativity ................................................................... 9
  1.4 Learning Orientation, Performance Avoid Orientation and Creativity .................. 12
  1.5 Goal Orientations and Creativity: The Role of Creative Self-Efficacy ................. 15
  1.6 Goal Orientations and Creativity: The Added Role of Intrinsic Motivation .......... 18
  1.7 An Alternative Hypothesis Based on Control Theory ............................................ 20
  1.8 The Motivational Model of Creativity .................................................................... 21
  1.9 Dynamic Affective States as Moderator ................................................................. 23
  1.10 Dynamic Affective States ....................................................................................... 24
  1.11 The Circumplex Model of Emotions ..................................................................... 25
  1.12 The Cognitive Tuning Effect of Valence ............................................................... 28
  1.13 The Moderating Effects of Affect on Goal Orientations and Creative Self-Efficacy ......................................................................................................................... 31
  1.14 The Moderating Effects of Affect on Creative Self-Efficacy and Creativity ....... 33
  1.15 Dual Tuning and Hyper-Charging Creativity ......................................................... 36

CHAPTER TWO: METHODS ......................................................................................... 38
  2.3 Measures ..................................................................................................................... 41
    2.3.1 Pre-screen survey ............................................................................................. 41
    2.3.2 Daily survey .................................................................................................... 41
    2.3.3 Attitudes Towards Divergent Thinking .......................................................... 41
    2.3.4 Goal Orientations ........................................................................................... 42
    2.3.5 Creative Self-efficacy ..................................................................................... 42
    2.3.6 Multidimensional Work Motivation Scale ..................................................... 43
    2.3.7 Creative Performance ...................................................................................... 43
    2.3.8 Multi-Affective States ..................................................................................... 43
  2.4 Data Analysis Strategy ............................................................................................... 43
    2.4.1 Estimating Growth Parameters ...................................................................... 44
    2.4.2 SEM: Relating Growth Parameters ................................................................ 45
    2.4.3 Competing Models Analysis .......................................................................... 47

CHAPTER THREE: RESULTS ....................................................................................... 49
  3.1 Assessment of Respondent Attrition ....................................................................... 49
  3.2 Assessment of Construct Validity .............................................................................. 49
  3.3 Descriptive Statistics ............................................................................................... 53
  3.4 LGCM: Assessment of Change ................................................................................. 60
  3.5 Alternative Data Analysis Strategy ........................................................................... 61
3.6 SEM: Testing the Theoretical Model................................................................. 62
3.7 SEM: Examining the Mediation Model............................................................ 64
3.8 Examining the Moderation Hypotheses.......................................................... 70

CHAPTER FOUR: DISCUSSION ............................................................................. 73
4.1 Goal Orientations, Creative Self-efficacy and Creativity...................................... 74
4.3 Affective States as Moderators of Motivation..................................................... 79
4.4 Testing a Dynamic Model of Creativity ............................................................ 82
4.5 Towards a Dynamic Model of Creativity.......................................................... 84
  4.5.1 Time Duration and Measurement Occasions ............................................... 84
  4.5.2 Dynamic Goal Orientations: Motivated Action Theory................................. 88
  4.5.3 Creative Self-efficacy and Creative Performance.......................................... 90
  4.5.4 Affective States: Affective Events Theory.................................................... 91
4.6 Theoretical Contributions ................................................................................. 92
4.7 Limitations and Future Research ....................................................................... 95
4.8 Practical Implications ....................................................................................... 98
4.9 Conclusion .................................................................................................... 100

CHAPTER FIVE: EXPLORATORY ANALYSIS .................................................... 101
5.1 Introduction .................................................................................................. 101
  5.1.1 The Alternative Creativity Model ............................................................... 101
  5.1.2 The Role of Affective States ..................................................................... 103
  5.1.3 Creative Self-Efficacy and Creativity ......................................................... 105
5.2 Methods ....................................................................................................... 106
5.3 Discussion .................................................................................................... 110

References .......................................................................................................... 112
Appendix A: Measures ...................................................................................... 131
Appendix B: LGCM Fits .................................................................................... 122
List of Tables

Table 1A.................................................................................................................................51

CFA Results for Theoretical and Alternative Measurement Models.................................51
Table 1A continued....................................................................................................................52

CFA Results for Theoretical and Alternative Measurement Model.......................................52
Table 2A.......................................................................................................................................54

Means, Standard Deviations, and Internal Consistency reliabilities for Order 1 variables
(Within-Subject) ..........................................................................................................................54
Table 2A continued....................................................................................................................55

Means, Standard Deviations, and Internal Consistency reliabilities for Order 1 variables
(Within-Subject) ..........................................................................................................................55
Table 2A continued....................................................................................................................56

Means, Standard Deviations, and Internal Consistency reliabilities for Order 1 variables
(Within-Subject) ..........................................................................................................................56
Table 2B.......................................................................................................................................57

Means, Standard Deviations, and Internal Consistency reliabilities for Order 1 variables
(Between-Subject) .......................................................................................................................57
Table 2B continued....................................................................................................................58

Means, Standard Deviations, and Internal Consistency reliabilities for Order 1 variables
(Between-Subject) .......................................................................................................................58
Table 2B continued....................................................................................................................59

Means, Standard Deviations, and Internal Consistency reliabilities for Order 1 variables
(Between-Subject) .......................................................................................................................59
Table 3A.......................................................................................................................................63

Testing Affective antecedents as moderators of the motivational model (week 1) .............63
Table 3B.......................................................................................................................................63

Testing Affective antecedents as moderators of the motivational model (week 2) .............63
Table 4A.......................................................................................................................................65
List of Figures and Illustrations

Figure 1: The Proposed Theoretical Model................................................................. 11

Figure 2: The Circumplex Model of Emotions proposed for the current study (adapted from Warr et al., 2014) ................................................................. 28
CHAPTER ONE: INTRODUCTION

Organizations are beginning to recognize that employee creativity—the generation of novel and useful ideas (Amabile, 1996)—is critical for an organization’s survival and competitiveness (George & Zhou, 2002). Driven by the assumption that employee creativity is beneficial for work outcomes such as job performance and innovative work behaviors, scholars have devoted considerable attention to identifying and understanding the antecedents that drive creativity (Gong, Haung, & Farh, 2009). In doing so, scholars have traditionally approached the study of creativity from a motivational perspective (Richter, Hirst, Van Knippenberg, & Baer, 2012; Shin & Zhou, 2007) or from an affective state perspective (De Dreu, Baas, & Nijstad, 2008; Isen & Baron, 1991). While the motivational perspective examines factors that contribute to creativity via increased intrinsic motivation (Ford, 1999), recent attempts have been made in examining dispositional differences in momentary goal orientations (e.g., learning and performance orientations) and how individual differences in these goal orientations relate to an individual’s motivation to seek out, or avoid opportunities to engage in learning and creativity (Hirst, Van Knippenberg, & Zhou, 2009). Meanwhile, the affective state perspective has demonstrated that positive affect is a powerful antecedent of creativity (De Dreu, et al., 2008).

Although both theoretical perspectives have garnered an extensive body of research, which provided us with useful insights into the cultivation of employee creativity, previous research has traditionally used one of the two above described theoretical lenses to study creativity in the workplace. This is somewhat surprising and problematic for two reasons. First, Button, Mathieu, and Zajac (1996, p.28) have argued that goal orientations are “somewhat stable and may be influenced by situational characteristics”. In a similar way, several scholars have argued that emotions, attitudes, and behaviors are interrelated and potentially intensify each other
over time (e.g., Beal, Weiss, Barros, & MacDermid, 2005; Mitchell & James, 2001; Shipp & Janssen, 2011). Despite these arguments in support of a dynamic relationships, most research on workplace creativity remains predominantly contemporaneous and does not adequately account for the dynamic nature of creativity in organizations (Shalley, Zhou, & Oldham, 2004; Tagger, 2002). Second, by ignoring this temporal context we are not doing justice to the theoretical tenets of one of the most prominent theories in creativity literature, the Componential Theory of Creativity (Amabile, 1996). The Componential Theory of Creativity is a process model that asserts that an individual’s level of creativity is a function of three components: 1) domain relevant skills, 2) creativity-relevant processes, and 3) task motivation. This theory explicitly states that creativity is a process that unfolds over time. However, more often than not, scholars are not taking into account the temporal context that is inherently present in this theory (Amabile, Barsade, Meuller & Staw, 2005). By doing so, the literature is oversimplifying and possibly distorting its understanding of workplace creativity; this compares to creating a painting and only using the color black to paint a colorful landscape.

In order to fully understand the chain of events leading to workplace creativity, I draw from the Componential Theory of Creativity (Amabile, 1996) to integrate the motivational (goal orientations) and affective states perspective on employee creativity. Further, in order to

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1 In the current study I focus on affective states or state affect, which needs to be conceptually distinguished from emotions and moods. State affect refers to the relatively intense, short-lived feelings that are linked to their antecedent causes, demand attention, and interrupt ongoing cognitive processes and behaviors (Forgas, 1995), whereas moods are less intense states that are not necessarily linked to a specific cause and do not interrupt ongoing processes and behavior (Brady, 1970). I nonetheless refer to emotions or mood when describing findings of previous studies because I use the authors’ original wordings.
accurately represent the dynamic nature of workplace creativity, I introduce the role of time to
demonstrate that workplace creativity is not static but instead ebbs and flows with the
hypothesized antecedents of the Componential Theory of Creativity (Amabile, 1996). By doing
so, I extend the creativity literature and address three critical issues: First, I conceptualize
creativity as a process and introduce the role of time to understand how the process of creativity
in the workplace unfolds (Amabile, 1996). By accounting for the role of time, I contend that the
antecedents of creativity (e.g., goal orientations and affective states) do not just happen, but
instead, gradually accumulate over time, with affective states intensifying goal orientations
leading to higher levels of creativity over time. Introducing a temporal context allows for
examination of the unfolding process of creativity in the workplace. Moreover, it will provide a
more ecological valid model of workplace creativity.

Second, although research on the affect-creativity relationship has flourished in the past
decade, the majority of studies have focused on the inherent “goodness” of positive affect or the
inherent “badness” of negative affect as an antecedent of employee creativity (Elfenbein, 2007).
Despite the apparent logic of this assumption, results of studies adhering to this uni-dimensional
approach have been mixed; several scholars found a positive relationship between positive affect
and creativity (Isen, 1999) and a negative relationship between negative affect and creativity
(Fredrickson, 2001), whereas other scholars have found support for the opposite (De Dreu et al.,
2008; Bless, Bohner, Schwarz, & Strack, 1990; George & Zhou, 2002). As a consequence, a
number of scholars have suggested that, rather than operating from the premise that positive
emotions should be promoted and negative emotions should be minimized, scholars should focus
on understanding the dual-tuning role that emotions plays (George & Zhou, 2007). Hence, I
extend the literature by introducing a Circumplex Model of Emotions (Warr, Bindl, Parker, &
Inceoglu, 2014) that conceptualizes affective states based on two dimensions: valence (i.e., pleasant versus unpleasant) and arousal (i.e., activating versus de-activating). I contend that this model provides the missing link to current affect-creativity research. Specifically, I propose that the arousal component is responsible for providing the much needed energy to engage in creative behaviors (Russell, 2003), while the valence component acts as a signal which tunes cognitions (Cognitive Tuning Model; Schwarz, 1990). That is, positive affect tunes individuals to engage in top-down processing whereby individuals are less systematic in their thinking, rely on pre-existing schemas (heuristics) and allows them to be more integrative, playful and expansive in their thinking (Bless & Schwarz, 1999; Clore, Gasper, & Gavin, 2001). Conversely, negative affect tunes individuals to engage in bottom-up processing such that individuals are more analytical and systematic in their thinking, which results in greater perseverance and effort when pursuing creative tasks (Schwarz, 1990). I test these assumptions by measuring both divergent and convergent thinking styles. Extending this even further, I blend the Circumplex Model of Emotions (Warr et al., 2014) with a dual-tuning approach to examine the dynamic interplay of affective states on creativity. By doing so, I suggest that the valence and arousal component of affective states can act to hypercharge individual’s creativity. More specifically, I contend that creativity will be at its highest when affective states are both activating, positive and negative. A dual-tuning approach recognizes that organizations are emotionally laden environments, with affective states in constant flux (George & Zhou, 2002). By accounting for the role of time and applying this perspective to the study of creativity, the findings will account for a more accurate representation of how affect and affective shifts are experienced in the workplace.

Third, I provide a framework that integrates two seemingly distinct, yet similar, streams of literatures by integrating two theoretical perspectives. First, I build upon the current
motivational perspective by introducing creative self-efficacy (Tierney & Farmer, 2004) and intrinsic motivation as mediators between goal-orientations (e.g., learning goal and avoid orientation) and creativity, arguing that creative self-efficacy leads to intrinsic motivation which leads to creativity. Further, using Amabile’s Compositional Theory of Creativity (1996), I integrate an affective state perspective into the former motivational perspective, contending that affective states may potentially serve as an important moderator on the relationship between goal orientations and creative self-efficacy as well as on the relationship between creative self-efficacy and creativity. Because I contend that affective states exert their effects by altering cognitive processing and by providing a motivational force, it may act as a moderator on either of the above-described paths. Hence, I will pit these two potential moderation relationships against one another in a competing models approach. As such, I present a complete framework that blends both motivational and cognitive processes to understanding the dynamic nature of employee creativity in the workplace.

1.1 Defining the Workplace Creativity Criterion Space

Workplace creativity is defined as the development of ideas or products that are both novel and potentially useful (Amabile, 1988; Shalley et al, 2004). Shalley and colleagues (2004, p. 934) define novelty as “ideas that are unique relative to other ideas currently available in organizations” and usefulness as “having potential for direct or indirect value to the organization, either in the short or long term”. At this point I would like to note that it is important to distinguish between workplace creativity and innovation; two terms that are closely related. Whereas creativity generally refers to the process of the generation of new ideas, the extant literature defines innovation as the development and implementation or application of a novel and useful idea (Janssen, 2000; West & Anderson, 1996). Creativity and innovation can be
thought of as two different parts of the same process; one cannot exist without the other. In sum, creativity describes the process of idea creation while innovation describes the activities that are required to successfully implement the ideas. Moreover, creativity is primarily concerned with intra-individual cognitive processes whereas innovation mainly represents inter-individual social processes in the workplace. The difference between these two constructs becomes apparent at the measurement level. Innovation measures tend to focus on the synergies between the individual, team and organizational levels (Drazin, Glynn & Kazajian, 1999), while creativity is generally measured via self-reports or other-ratings of creativity (Amabile, 2015). One popular method of measuring creativity is the use of Amable’s (1988) Consensual Assessment Technique (CAT), the CAT is often referred to as the gold standard for assessment of creativity (Carson, 2006). Essentially, the method relies on a panel of subject matter experts that are familiar with the domain to provide independent feedback in order to assess creativity. While research on the CAT method demonstrates high inter-rater reliability (Kaufman, Baer, Cole & Sexton, 2008), it is not a suitable approach for assessing the process of creativity as the technique is generally used in situations where the creativity assessment is assigned to a product, object or tangible good.

The current study is concerned with the dynamics of creativity which is highly temporal; ideas may occur over a period of an hour, a day, a week, or a year. However, this does not imply that individuals discuss these ideas or implement them in the moment. As a corollary, creativity on any particular day is not necessarily observed by others or can be captured by objective outcomes such as supervisor or peer ratings. Thus, I believe that the most valid means of measuring an individual’s creativity process on a particular workday is through self-report (Kahneman, Kreuger, Schkade, Schwarz, & Stone, 2004; Shalley, Gilson, & Blum, 2009; Bledow, Rosing, & Frese, 2009)
Although having a consensual definition of workplace creativity might reduce ambiguity when talking about creativity in the workplace, I would like to note that any judgment of creativity by relevant stakeholders (e.g., managers, customers, experts) still is subjective and highly dependent on the context in which such judgment is made (Hennessy & Amabile, 2010). That is, such judgment of novelty may depend on the type of judge and contextual factors (e.g., time or location). For example, while the introduction of lattes and espressos by Starbucks was a novel idea for markets in the United states, it had been a commonplace practice for most cafes in Italy. Similarly, these contextual issues exist when determining the usefulness of an idea. For example, in the 1960s, fuel efficient cars were criticized for their lack of power, but today they are considered a useful way to combat global warming and other environmental issues.

Further, given that workplace creativity is a process, I turn to examining its antecedents as dynamic constructs in order to fully represent the construct as it is theorized by the Componential Theory of Creativity (Amabile, 1996).

1.2 The Componential Theory of Creativity

The componential theory of creativity is recognized as one of the major theories of creativity in individuals and in organizations (Amabile, 2015). The theory is grounded in the definition of creativity as the production of ideas that are both novel and useful (Amabile, 1988). Moreover, it describes the creativity process as an interplay between person and environment, where individuals in a social environment assemble and use information when attempting to arrive at a creative solution or response (Amabile, 1983a). This process can be divided into five stages: 1) problem identification, 2) information gathering, 3) idea generation, 4) validating solution and 5) communication of solution to others. It is important to note that although the model is presented as a process, it does not function like the traditional process model whereby
each stage occurs progressively, leading into the next one. Instead, the progress of each stage may occur simultaneously and build upon each other iteratively (Amabile, 2015). Crucial to the creativity process are three components that form the building blocks for individual creativity: a) domain-relevant skills, b) creativity-relevant skills, and c) intrinsic motivation (Amabile, 1988). Given the dearth of research and in response to a call for research regarding the dynamic effects of the individual components of creativity (Bledow et al, 2013), the current dissertation focuses solely on the idea generation stage (e.g., stage 3) and examines how dynamism of the creativity components affect overall creativity (e.g., idea generation).

The first component of individual creativity are domain relevant skills. Domain relevant skills form the basis from which the creativity process begins. Domain relevant skills generally refer to an individual’s knowledge, skills or abilities in their respective domain (Amabile, 1988). For example, an employee completing a research and development (R&D) project cannot possibly be creative if they do not possess a basic understanding of how their domain works. As a corollary, domain relevant skills essentially constitute the individual’s raw materials to be creative, only once these skills are developed can workplace creativity be realized (Woodman, Sawyer & Griffin, 1993; Oldham & Cummings, 1996; Amabile, 2015). It is for this reason, the proposed model uses goal orientations as the primary antecedent of workplace creativity (see figure 1). Goal orientations are particularly relevant in relation to creativity because they relate to how an individual approaches skill acquisition (Dweck, 1986). Past research has demonstrated the role of goal orientations in the development of individual self-efficacy and intrinsic motivation (Janssen & Van Yperen, 2004).

The second component of the componential theory of creativity is creativity relevant skills (Amabile, 1988). This component refers to a plethora of characteristics that are inductive to
workplace creativity such as thinking styles (Janssen & Van Yperen, 1998), personality (Oldham & Cummings, 1996), creative self-efficacy (Tierney & Farmer, 2002) and affect (Bledow et al, 2013). By no means is this list of creativity relevant skills exhaustive, however, it is meant to illustrate that creative relevant skills refer to skills or characteristics that allow an individual to “think outside of the box”. The proposed model focuses on creative self-efficacy as a mediator between goal orientations and workplace creativity. Past research has demonstrated the importance of goal orientations in developing creative self-efficacy (Hirst, Knippenberg & Zhou, 2009) and separately, the important link between creative self-efficacy and workplace creativity (Tierney & Farmer, 2002, 2004). Moreover, the model explores the role of affect and thinking styles as moderators of creativity as past research indicates that affect and thinking styles augment levels of workplace creativity (Fredrickson, 2002).

The third component of the componential theory of creativity is intrinsic motivation (Amabile, 1988). Intrinsic motivation describes motivation that occurs because a task is interesting, involving or satisfying to the individual (Deci & Ryan, 2000). Drawing from self-efficacy theories, it is argued that intrinsic motivation is a product of self-efficacy and thus, the last mediator to the dynamic model of creativity.

1.3 Testing a Dynamic model of Creativity

In a recent revision to the model, Amabile and Pratt (2016) highlighted the importance of studying the dynamism of the individual components of the creativity process. They specify that each of the three components are subject to change, from moment to moment, in response to fluctuations in affect and on changes in the work environment. The dynamism described by the authors highlight that creativity is an ongoing process that is constantly changing, with fluctuations in each component ultimately affecting creative performance. Although the authors
have recently revised their model to include a dynamic component, there has been little research
to date that tests these propositions. Given that a growing number of scholars (Sonnentag, 2012)
are calling for dynamic research, empirical research *explicitly* testing dynamic propositions are
the first step to understanding dynamic theories. Currently, the state, and trend of the creativity
literature is to advance box-and-arrow models of dynamic theories. Continually theorizing about
dynamism without testing propositions limits our understanding of creativity. The current study
investigates the dynamism of all the components in the Componential Theory of Creativity
(Amabile, 1996) in a workplace environment. This is accomplished by first developing an
understanding of the key constructs of each of the antecedents in the model, then, specifying how
each construct relates to each other over time, and finally, hypothesizing about how the
constructs change over time (Cronin & Vancouver, 2017).

The proposed model investigates how dynamic shifts in the three individual creativity
components/antecedents affect overall creativity. To be specific, it will be argued that goal
orientations are both a domain relevant and creativity relevant skill, which will lead to the
development of a creativity relevant skill, creative self-efficacy. Creative self-efficacy will then
drive intrinsic motivation (Tierney & Farmer, 2002) which will ultimately lead to higher levels
of individual creativity. Together, these components form the *motivational* mediation model.
Taking the model one step further, I propose that affect, a creativity relevant skill, will moderate
the motivational mediation model. Research has demonstrated a strong link between affect and
creativity (De Dreu et al, 2008), with this effect being driven by modifying an individual’s
thinking styles (e.g., divergent thinking; Bless & Schwarz, 1999). That being said, I suspect that
the moderation of affect on motivation will occur on all paths. The proposed model is presented
below, details of each component will be covered in the subsequent sections:
To ground the model in an example, and to highlight the need to study the model dynamically, imagine two individuals within the same organization that begin with similar goal orientations but depending on events that occur over time, their adoption and level of endorsement of their goal orientations (e.g., learning vs. avoiding) may begin to vary. One employee may begin to endorse learning goals as a result of compliments from his/her manager, which in turn leads to an intensification of his/her creative self-efficacy, motivation, affect and ultimately, creativity. At the same time, another employee may experience punishment from a recent failure and as a consequence shifts to endorsing avoidance goals, setting off a motivational tumble, and declining affect resulting in lower creativity. In the present study, I
therefore account for the role of time; allowing examination of the variability in each antecedent and the temporal relationship between the variables.

1.4 Learning Orientation, Performance Avoid Orientation and Creativity

A growing body of research starts to reveal that learning goal orientations have a strong positive influence on creativity (e.g., Hirst et al., 2009; Huang & Luthans, 2015; Weisberg, 1999), whereas performance avoid orientations have a negative influence on creative output (Janssen & Van Yperen, 1998). In this regard, learning goal orientations (from hereon, learning orientation) and performance avoid orientations (from hereon, avoid orientation) are particularly relevant in relation to creativity because they both relate to how an individual approaches skill acquisition and their subsequent self-efficacy and motivation for the task. Recent research has found that goal oriented behavior can vary across time and situations (DeShon & Gillespie, 2005) with endorsements of certain orientations (e.g., learning or avoid goals) varying by as much as 20-30% over the course of a single task (Converse et al., 2013). These rapid changes in an individual’s endorsement of goal orientations (e.g., learning and avoid orientation) imply that patterns of skill acquisition in relation to motivation for creative tasks might be affected. For example, a learning orientation is an internal mind-set that motivates individuals towards the acquisition of new knowledge and the development of new skills. Janssen and Van Yperen (2004) argued that the focus on skill development associated with a learning orientation implies an intrinsic interest in understanding and mastering task performance. Hence, individuals with a stronger and increasing focus on learning orientation are expected to be more intrinsically motivated to seek out creative activities, which by definition involve uncertain and untried approaches that possess a high likelihood of error or potential failure (Janssen & Van Yperen, 1998). That is, the intrinsic task motivation provided by a learning orientation is believed to
encourage individuals to invest effort and show perseverance on difficult tasks (Ames & Archer, 1988). As a corollary, when obstacles are encountered, learning-oriented individuals are believed to deal with these challenges by investing additional effort to develop and master new skills (Vandewall, Cron, & Slocum, 2001). Several scholars have indeed found a positive relationship between learning orientations and engagement in innovative behaviors (Janssen & Van Yperen, 2004) and creativity (Hirst et al., 2009; Gong et al., 2009). Given the evidence above, I have reason to believe that similar mechanisms will occur over time. Thus, I contend that as individuals experience accumulations of learning orientations, their focus on obtaining new knowledge and skill development may feed into creativity by engendering the development of domain relevant skills, creativity relevant skills and intrinsic motivation. Therefore, I hypothesize the following:

*Hypothesis 1: An accumulation in learning orientations over time is positively related to an accumulation in creativity over time.*

While a learning orientation may foster creativity by encouraging individuals to engage in a learning process, the opposite may be true for avoid orientations. Individuals with an avoid orientation strive to avoid unfavorable assessments of themselves by their peers or managers (Simmons & Ren, 2009). Such individuals are thought to have a maladaptive approach to situations that involve challenge or difficulty, such as tasks that require creativity or innovation (Button et al., 1996; Dweck & Leggett, 1988). Bell and Kozlowski (2008) found that individuals with a high avoid orientation have a greater propensity to withdraw from tasks (especially in the face of failure), are less interested in difficult tasks, and have the tendency to seek less challenging material. VandeWalle (1997) contends that avoid orientations are detrimental to creativity because creative tasks inherently hold a risk of failure. As a consequence, the
possibility of appearing incompetent discourages individuals from engaging in risky or challenging activities. More specifically, individuals characterized by an avoid orientation share the belief that ability is a personal attribute that cannot be changed (Button et al., 1996). As a consequence, engaging in creative tasks with a high chance for failure is likely to affect their perceptions of their ability (e.g., incompetent). Moreover, because they are disposed to avoid failure, scholars contend that individuals high in avoid orientation will avoid the challenge of creative tasks (VandeWalle, 1997). In corroboration, recent research has found a negative relationship between avoid orientations and creativity (Gong, Kim, Lee, & Zhu, 2013). Upon further analysis, the authors found that individuals higher on avoid orientations were less likely to engage in information exchange with others in fear of being judged. Similarly, Janssen and Van Yperen (1998) found that individuals high in avoid orientations avoided creative tasks if the tasks implied the risk of failure. Further, Fisher and Ford (1998) found that individuals high on avoid orientations generally used less complex learning strategies, applied less effort, and were less motivated than individuals with learning orientations. Similarly, Colquitt and Simmering (1998) found that performance goal orientations were negatively related to the motivation to learn. In sum, research on avoid orientations has demonstrated that avoid orientations are negatively related to performance and are detrimental to the learning process, which is a fundamental antecedent of creativity. Building on this and bringing in the role of time, I thus argue that when employees experience an increase in avoid orientations, their concern for others’ approval of their work detracts them from engaging in creative tasks, thus, they will perform less creatively. Thus, I hypothesize the following:

Hypothesis 2: An accumulation of avoid orientations over time is negatively related to an accumulation of creativity over time.
I chose learning and avoid orientations as predictors of employee creativity because they are both related to whether an individual will develop the competence to be creative through learning behaviors. Moreover, performance approach orientations were not examined because these individuals are primarily motivated by external outcomes associated with performance such as monetary rewards or positive feedback. Without controlling for contextual cues, I am unable to provide a clear test of performance approach orientations. Further, research on performance goal orientations on task performance has been inconsistent, with some studies finding negative relationships (Vandewalle et al., 2001; Ford, Smith, Weissbein, Gully & Salas, 1998), others with finding a null relationship (Vandewalle et al., 2001; Vandewalle, Brown, Cron & Slocum, 1999) and others finding positive relationships (Vandeewall et al., 2001; Hoover, Steele-Johnson Beauregard, & Schidt, 1999). For these reasons, I do not hypothesize on the effect of performance approach orientations.

1.5 Goal Orientations and Creativity: The Role of Creative Self-Efficacy

In the previous section, I discussed goal orientations in relation to an individual’s desire to approaches or avoids creative tasks. Notwithstanding the above cited theoretical and empirical evidence for the direct relationship between goal orientations and creativity, I introduce Bandura’s (1997) work on self-efficacy to propose creative self-efficacy as a mediator between goal orientations and creativity. Bandura (1997) argues that self-efficacy is a necessary condition for the discovery of new knowledge and creative productivity. Because self-efficacy influences the motivation and ability to engage in certain behaviors (Bandura, 1997), as well as the pursuit of certain tasks (Bandura, 1986), the concept of self-efficacy holds much promise for understanding creative action in organizational settings. As a consequence, Tierney and Farmer (2002) developed and defined creative self-efficacy as an employees’ self-view concerning the
extent to which they are capable of being creative. In line with self-efficacy theory (Bandura, 1997), Tierney and Farmer (2002, 2004) found that employees tend to be more creative when they have higher levels of creative self-efficacy.

In this section, I contend that learning orientations are conducive to the formation and maintenance of creative self-efficacy, while avoid orientations are negatively related to creative self-efficacy. Learning orientations are grounded in the belief that ability is malleable (Dweck, 1986). Such a conception of ability allows an individual to believe that (s)he can improve his/her abilities, resulting in higher levels of self-efficacy (Bandura, 1997). That is, individuals characterized by strong learning orientations are focused on self-improvement and competence development. As a consequence, they will actively seek out the acquisition of new knowledge and, by doing so, increase the likelihood of successful mastery. As a corollary, these individual’s possess more domain specific knowledge and skills and should be more efficacious when it comes to producing creative outcomes, which will increase their levels of creative self-efficacy (Gong et al., 2009). Further, individuals high in learning orientation are unlikely to attribute setbacks in creative endeavors to internal ability factors. In contrast, they are more likely to attribute them to factors such as insufficient effort or ineffective strategies (Dweck & Leggett, 1988). As a result, they are less likely to experience aversive arousal and therefore more likely to maintain their self-efficacy in creative endeavors. A number of scholars have indeed found a positive relationship between learning orientations and beliefs of creative self-efficacy (Hirst et al., 2009; Tierney & Farmer, 2011). Following the previous hypotheses and accounting for the role of time, I posit that as an individual’s endorsement of learning orientations accumulate, their increased mastery focus will lead to higher beliefs of their ability to be creative (e.g., creative self-efficacy) resulting in higher levels of creativity over time. Stated as a hypothesis:
Hypothesis 3: An accumulation in creative self-efficacy over time mediates the positive relationship between an accumulation in learning orientation and an accumulation in creativity over time.

In contrast, individuals high in avoid orientation are primarily motivated to avoid unfavorable assessments of themselves by their peers or managers. When individuals, who are high on avoid orientations, are working on a task, they are highly interested in managing how they are perceived by others and are likely to avoid tasks that may implicate their incompetence (Brett & VandeWalle, 1999; Button et al., 1996). As a consequence, individuals high on avoid orientations tend to avoid creative tasks because these tasks are, by definition, ambiguous and imply the chance of failure (Janssen & Van Yperen, 1998). Specifically, individuals with avoid orientations exhibit the tendency to compare themselves to similar others in order to shield their level of competence and beliefs about their ability from criticism (Dweck, 1989). In other words, individuals high in avoid orientations are motivated to avoid creative tasks because they imply a high chance of failure and thus a higher chance of receiving criticism (Simmons & Ren, 2009). Similarly, Brett and VandeWalle (1999) argued that the attention placed on avoiding criticism from peers and superiors will detrimentally effect creative task output. As a result, I argue that this divided attention will damage their creative self-efficacy toward creative tasks, which in turn, will lower their ability to be creative. Further, since individuals with avoid orientations tend to avoid creative tasks, the learning process that is required to successfully produce creative output will be hindered (Janssen & Van Yperen, 1998), further affecting an individual’s belief that they can be creative.

Currently, there is a dearth in research that directly links avoid orientations with creative self-efficacy. However, research on general self-efficacy consistently demonstrated that avoid
orientations are negatively related to general self-efficacy (Ford, Smith, Weissbein, Gully & Salas, 1998; Phillips & Gully, 1997). Following recommendations by Bandura (1997) that efficacy measurements must be tailored to the domain being studied in terms of content as well as degree of specificity, I expect a similar relationship will occur over time. Such that, as an individual increases their endorsement of avoid orientations over time, their belief that ability is fixed will detract from their belief that they are capable of performing creatively (e.g., creative self-efficacy) resulting in lower creativity over time.

Hypothesis 4: An accumulation in creative self-efficacy over time mediates the negative relationship between an accumulation in avoid orientation and an accumulation in creativity over time.

1.6 Goal Orientations and Creativity: The Added Role of Intrinsic Motivation

Although creative self-efficacy is argued to mediate the relationship between goal orientations and creativity, I further consider the mechanism behind how creative self-efficacy beliefs may trigger creativity through intrinsic motivation. Intrinsic motivation is defined as a behavior that is performed due to the sheer fascination of the task itself (e.g., enjoyable), rather than simply because of its outcomes (Deci & Ryan, 1985). In various theories, self-efficacy is proposed as a factor that determines behavior. For instance, the Expectancy Theory (Vroom, 1964) assumes that the likelihood of attaining a valued outcome leads to a specific behavior. If a person believes they can achieve their goal, they will be more likely to repeat the behavior. These thoughts were echoed by Weiner’s (1972) Attribution Theory which states that an individual’s beliefs towards a specific outcome ultimately guide behavior. Similarly, Deci and Ryan’s (2000) Self-Determination Theory states that a person’s feelings of competence is related to a person’s level of intrinsic motivation. Moreover, Wood and Bandura (1989, p.408) stated
that, “self-efficacy refers to beliefs in one’s capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands”. This statement substantiated the importance of self-efficacy beliefs in the role of motivational processes. These theories all share the tenet that self-efficacy beliefs are necessary antecedents of motivational processes which ultimately lead to behavioral changes such as performance. As a corollary, I contend that as an individual’s belief in their capability towards creative tasks increase (creative self-efficacy) over time, that individual will be even more motivated towards pursuing creative behaviors (intrinsic motivation). On the contrary, individuals who experience decreases in their creative self-efficacy beliefs have lower confidence in their abilities which will subsequently affect their levels of motivation towards creative tasks. I thus hypothesize:

**Hypothesis 5:** An accumulation in creative self-efficacy over time is positively related to an accumulation in intrinsic motivation over time.

For several decades, researchers have linked intrinsic motivation as an important driver of creativity (Elsbach & Hargadon, 2006). Amabile (1983) argued that although creativity can be attributed to certain traits and abilities of individuals, the actual outcome of creative results is dependent on the individual’s intrinsic motivation. Further supporting this contention is Steiner (1965) who argued that, in order to be creative, an individual has to be inherently interested in the issue or problem in order to be motivated to find a solution. Similarly, Ryan & Deci (2000) contend that when employees are intrinsically motivated, they expend effort based on interest, curiosity and a desire to learn, resulting in creative outcomes (Ryan & Deci, 2000). Other mechanisms by which intrinsic motivation may foster creativity are through idea exploration (Zhou, 1998), persistence (Oldham and Cummings, 1996), flexibility and spontaneity (Amabile, 1983). Indeed, numerous researchers have found a strong link between intrinsic motivation and
creativity (Tierney, Farmer & Garaen, 1999; Amabile, 1985; Prabhu, Sutton & Sauser, 2008; Amabile, Hill, Hennessy & Tighe, 1994). Extending these findings, I contend that as individuals become more intrinsically motivated over time, they will become even more capable of performing creativity as they expend effort based on their own interest, curiosity and desire to learn. Hence, I argue that accumulations of creative self-efficacy will result in higher levels of intrinsic motivation and ultimately, higher creative output.

Hypothesis 6: An accumulation of intrinsic motivation over time is positively related to an accumulation of creativity over time.

Combining the above two hypotheses, I argue that as an individual’s belief in their own creative abilities increases over time, they will be more motivated towards pursuing creative tasks greater perseverance while engaging in creative tasks, resulting in higher levels of creativity over time.

Hypothesis 7: An accumulation in intrinsic motivation over time mediates the positive relationship between an accumulation in creative self-efficacy over time and an accumulation of creativity over time.

1.7 An Alternative Hypothesis Based on Control Theory

Although in the previous section I hypothesized that increasing and accumulating levels of creative self-efficacy would result in further increased levels of creativity through an accumulation of intrinsic motivation, I need to acknowledge an opposite effect based on an alternative theory. Control Theory (Powers, 1991) posits that self-efficacy and performance evolve over time, which requires an examination of dynamic, within person processes (Powers, 1991; Vancouver et al 2001). Control Theory suggests that self-efficacy’s effect on performance can be positive, negative or null depending on the way in which self-efficacy beliefs exert their
effects. In a series of studies, Vancouver and colleagues (2001, 2002) found that high levels of self-efficacy lead to a decrease in motivation resulting in a decrease in performance on a number of laboratory tasks. According to Control Theory (Powers, 1991), self-efficacy beliefs influence subjective assessments of task difficulty, with higher levels of self-efficacy leading to the perception that tasks are easier than they appear, resulting in lower levels of motivation and subsequently lower overall performance. However, within the domain of creative self-efficacy, a recent field study by Tierney and Farmer (2010) found results in support of a positive relationship between creative self-efficacy and performance over time. The authors conducted a 6-month study and found that employees’ creative performance increased as their sense of self-efficacy became stronger over time. They argued that this effect was due to the fact that individuals at work are required to perform creatively which buffers them from the negative feedback loop found in Vancouver’s studies (e.g., higher self-efficacy resulting in lower performance). Although the previous study lends support to Bandura’s (1997) Social Cognitive Theory, more studies are required before findings can be conclusive. Therefore, I further investigate a competing hypothesis based on Powers’ (1991) Control Theory and argue that increasing levels of self-efficacy over time will lead to lowered levels of creativity through lowered levels of motivation.

Hypothesis 8: An accumulation in intrinsic motivation over time mediates the negative relationship between an accumulation in creative self-efficacy over time and an accumulation of creativity over time.

1.8 The Motivational Model of Creativity

Although intrinsic motivation is considered a crucial theoretical underpinning of creativity theories, it is very rarely empirically examined (Shalley, 1995; Oldham & Cummings,
1996; Zhou, 1998; George & Zhou 2001), with few exceptions (Tierney et al, 1999; Shin & Zhou, 2003). In a review by Ambrose and Kulik (1999, p.266) the authors stated that “individual level creativity is closely linked to the motivation process and research on creativity has either implicitly or explicitly used motivation as an invisible, internal, hypothetical construct directing employee behavior”. As a result, the role of intrinsic motivation relative to creativity in the workplace remains largely unexplored. I address this problem by accounting for the role of intrinsic motivation in our previously hypothesized model.

Recall from the previous section that learning orientations are grounded in the belief that ability is malleable (Dweck, 1986) while avoid oriented individuals believe that ability is fixed. It follows that accumulations in learning orientations focus individuals on skill development and task mastery, which results in accumulations of creative self-efficacy beliefs (Gong et al., 2009). These increased beliefs in one’s creative abilities then result in accumulations in intrinsic motivation towards creative tasks, subsequently leading to higher levels of creative output. Similarly, the opposite can be argued with avoid orientations. Avoid oriented individuals are motivated to avoid unfavorable assessments of themselves by their peers or managers and research has found that avoid orientations are negatively related to self-efficacy (Ford et al., 1998). Therefore, a shift to adopting and endorsing (e.g., accumulating) avoid orientations would lead to a decrease in creative self-efficacy resulting in lower levels of intrinsic motivation and subsequently, creativity. From this, I hypothesize:

_Hypothesis 9a:_ An accumulation in learning orientation over time is positively related to an accumulation in creativity over time. This relationship is mediated by an accumulation in creative self-efficacy and an accumulation in intrinsic motivation over time.
Hypothesis 9b: An accumulation in avoid orientation over time is negatively related to an accumulation in creativity over time. This relationship is mediated by a further decrease in creative self-efficacy and a further decrease in intrinsic motivation over time.

1.9 Dynamic Affective States as Moderator

Current research on goal orientations only explains whether an individual is motivated to engage in a creative task, but does not account for how creative that individual might be. Amabile’s (1996) Componential Theory of Creativity describes the process underlying creativity as well as the various contextual factors that influence this process and its outcomes. Central to Componential Theory of Creativity (Amabile, 1996) is that an individual’s level of creativity at any given point in time is a function of the creativity components operating within that person as well as in the environment surrounding that person. These three components are: 1) domain relevant skills such as subject expertise, 2) creativity-relevant processes such as cognitive processes conducive to novel thinking, and 3) task motivation such as intrinsic motivation.

In the previous sections I argued that goal orientations will influence whether an individual seeks to engage in, or refrain from, creative tasks, which in turn could affect an individual’s creative self-efficacy and intrinsic motivation, ultimately influencing an individual’s creative output. In other words, I laid out the basic premises for the mechanisms behind the development of domain relevant skills and task motivation based on goal orientations, creative self-efficacy, and intrinsic motivation. Building on this, I now turn to one of the most researched areas in the creativity literature, namely affective states. I contend that affective states account for an additional component (i.e., creativity-relevant processes) that is not accounted for in current motivational-creativity models.
1.10 Dynamic Affective States

A fundamental characteristic of emotions and affective states is that they change over time (Kuppens, Oravecz, & Tuerlinckx, 2010). Positive and negative affect fluctuate over time, and changes in an individual’s affective level are associated with changes in an individual’s attentional focus, mode of thinking and creativity (Friedman & Forster, 2010). Amabile and colleagues (2005) argue that, given the dynamic nature of affective states, it is difficult to draw a conclusion on the relationship between affective states and creativity based solely on cross-sectional studies. In order to develop a dynamic model of workplace creativity, I set out to investigate how employees’ affective states change over time, and how this subsequent change influences change in the levels of creativity over time. As demonstrated by a number of researchers, affect can have a strong positive influence on cognitions, levels of persistence, effort, motivation, and performance (Erez & Isen, 2002; Grandey, 2003; Seo, Barrett, & Bartunek, 2004).

In the next section, I introduce the Circumplex Model of Emotions (Warr et al., 2014) and contend that affective states may potentially serve as an important moderator on the relationship between goal orientations and creative self-efficacy, as well as on the relationship between creative self-efficacy and creativity. Specifically, I posit that the arousal dimension of an affective state is responsible for providing the much needed energy to engage in creative

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2 I also recognize that previous research has shown that people can be meaningfully characterized in terms of how they feel on average, demonstrating individual differences in average levels of positive and negative affectivity (Watson & Tellegen, 1985). However, it is important to note, that this does not detract from the dynamic perspective on affect as previous research should only be taken as evidence that affect can be meaningfully characterized as a mean level—it does not stand as evidence that affect is stable.
behaviors (Russel, 2003), while the valence component acts as a signal which tunes cognitions (Schwarz, 1990).

1.11 The Circumplex Model of Emotions

The Circumplex Model of Emotions has been among the most widely studied representations of affect (Remington et al, 2000). It postulates that the underlying structure of affective states can be ordered around the circumference of a circle (Russell, 1980; See Figure 1). The similarity of affective states is presumed to be a function of their distance from one another in the circumplex, affective states closer together are more similar while those that are further on the circumplex are more dissimilar. In other words, the model implies that affective states that are directly opposite from one another (90 degrees) should be completely uncorrelated with each other (Russell, 1980).

Construct validity for the Circumplex Model of Emotions has been established from principal-component analyses of self-reported affect and multidimensional-scaling analyses of similarity judgments of affective states, resulting in affective states forming a circular pattern in a 2-dimensional space (Remington et al, 2000). Similarly, studies examining the judgment of emotions in facial expressions in both adults (Green & Cliff, 1975; Shepard, 1962) and children (Russell & Bullock, 1985; Russel & Ridgeway, 1983) have replicated a circular structure (Almagor & Ben-Porath, 1989; Watson, Clark, & Tellegen, 1983). The growing evidence from research on self-reported mood and neurophysiological research suggests that the circular ordering of affect can be parsed along two dimensions: valence (i.e., pleasant versus unpleasant) and arousal (i.e., activating versus de-activating) (Barrett, 2006; Heller, Nitschke, & Lindsay, 1997; See Figure 1). For example, some affective states are positive in tone and activating (e.g., happy, elated), while others are positive in tone and deactivating (e.g., calm, relaxed).
Conversely, some states are negative in tone and deactivating (e.g., sad, depressed), whereas others are negative in tone and activating (e.g., anger, fear). As a corollary, the Circumplex Model of Emotions (Russell, 1980) represents affective states over four quadrants, High Activation Positive Affect (HAPA), High Activation Negative Affect (HANA), Low Activation Negative Affect (LANA) and Low Activation Positive Affect (LAPA). Contrasting the Circumplex Model of Emotions (Russell, 1980), and often confused as a fundamentally different representation of affect, is the Positive Affect Negative Affect Schedule (PANAS; Watson & Tellegen, 1985; Zevon & Tellegen, 1982). The PANAS was derived from factor analyses of inter- and intra-individual data from self-reported affect. However, in support of Russell’s (1980) Circumplex Model, Watson and Tellegen (1985) replicated the two dimensions of the Circumplex model reflecting valence and activation (labelled as engagement to disengagement). Watson and Tellegen (1985) designed the PANAS by selecting affective terms that were relatively pure markers of either positive affect (PA) or negative affect (NA). Albeit providing a clear differentiation of PA and NA, their scales of affect have been criticized for their use of overly broad clusters of diverse states (Yik, Russell, & Steiger, 2011). For example, Watson and Tellegen’s (1985) PA scale included feelings of alertness and happiness; two states which, although positive in their tone, are not conceptually related. According to a Circumplex Model, “alert” would be a high activation and negative affect state that would induce higher levels of energy as compared to “happy” which is a low activation and positive affective state. Hence, although the PANAS scales are often referred to as measuring PA or NA, they are restricted to activated forms of affect only (Remington, Fabrigar, & Visser, 2000). It should be clear from the above description that the PANAS (Watson & Tellegen, 1985) and Circumplex model (Russell,
1980) are 45’ rotational variants of one another, rather than fundamentally different conceptualizations.

This distinction is important as the majority of previous research on the affect-creativity relationship has only examined positive and negative activated mood states (Amabile, Barsade, Mueller, & Staw, 2005; De Dreu et al., 2008; George & Zhou, 2002). However, more recently, Baas, De Dreu, and Nijstad (2008) investigated the effects of activating and deactivating mood states and found that activating affective states, regardless of their valence (e.g., happy, elated, and anger) were associated with higher levels of creativity than mood-neutral controls, whereas deactivated mood states (e.g., sadness, relaxed, and calm) had no effect on creativity. A number of scholars have since recognized how this distinction may influence the affect-creativity literature and have recommended that future research examine both valence and arousal components in tandem (Anderson, Potocnik, & Zhou, 2014; Zhou & Hoever, 2014). Given that low activation positive affect and low activation negative affect states are of focal interest in the current study, the exclusion of such states from the PANAS constitutes a critical limitation. Further, the 4-quadrant perspective offered by the circumplex model offers greater specificity of analysis and precision of prediction and will be adopted here.
Figure 2: The Circumplex Model of Emotions proposed for the current study (adapted from Warr et al., 2014)

1.12 The Cognitive Tuning Effect of Valence

Schwarz’s (1990) Cognitive Tuning Model offers an explanation of how both positive and negative affective states may influence creativity. The Cognitive Tuning Model is derived from the evolutionary significance of mood to an organism. According to Schwarz (1990), moods convey important information about the environment, such that positive moods signal safety and the perception that no action is required, whereas negative moods signal threat and the perception that action is needed to mitigate the cause of the perceived threat. An important corollary to this model is that moods evokes different thinking styles, such that positive moods engender divergent thinking while negative moods engender convergent thinking styles. Positive moods are associated with less systematic thinking, and a more heuristic style of information
processing (top-down), which enhances an individual’s ability to be more integrative, playful and expansive in their thinking (Bless & Schwarz, 1999; Clore et al., 2001). In contrast, negative moods are associated with a more analytical and systematic style of thinking (bottom-up), which results in a greater perseverance and effort used when pursuing creative tasks (Schwarz, 1990). Supporting this contention, Isen’s (1999a, 1999b) Affect-Creativity Link Model and Fredrickson’s (2001) Broaden-and-Build Theory offer similar propositions. However, much of their work has solely focused on examining the positive affect-creativity relationship. Isen (1999a) proposed that positive affect has three primary effects on creativity: 1) it increases the number of cognitive elements available for association, 2) it leads to a defocusing of attention, allowing seemingly disparate pieces of information to associate, and 3) it increases cognitive flexibility, increasing the probability that diverse cognitive elements become associated. In a series of studies, Isen and colleagues, (1985) demonstrated that individuals induced with positive affect performed better on creative word association tasks, outperformed their neutral mood counterparts on ingenuity tests (Isen, Daubman, & Nowicki, 1987), and demonstrated higher levels of divergent thinking (Abele-Brehm, 1992). Similarly, Fredrickson’s (2001) Broaden-and-Build Theory of positive emotion posits that positive emotions, such as joy and love, broaden a person’s available repertoire of cognitions and actions. In contrast, these individuals will be more likely to pursue novel, creative, and unscripted paths of thought and action (e.g., top-down processing). She concludes that positive emotions broaden the scope of attention (increasing the number of cognitive elements available for association) and the scope of cognition (increasing the breadth of those elements that are treated as relevant to the problem). Extending these findings and accounting for the role of time, I contend that as an individual experience’s accumulations in positive affect, they will experience more cognitive flexibility, resulting in
greater levels of divergent thinking. Conversely, as individual’s experience accumulations of negative affect, they will be more systematic in their thought processes, resulting in greater levels of convergent thinking. Extending these findings, I hypothesize that:

Hypothesis 10a: An accumulation in positive affect over time is positively related to an accumulation in divergent thinking over time.

Hypothesis 10b: An accumulation in negative affect over time is positively related to an accumulation in convergent thinking over time.

Although the above outlined theories posit that positive affect would contribute to creativity while negative affect may reduce creativity, recent research demonstrates that the affect-creativity relationship does not appear to be as clear cut as proposed. An emerging body of literature is starting to recognize the complex and nuanced relationship between affect and creativity (George & Zhou, 2007). For example, Kaufmann and Vosburg (1997) have proposed that creativity may draw from the whole spectrum of affective experiences, including negative feelings such as anxiety, frustration and distress. There is indeed some empirical evidence showing that both positive and negative affective experiences may lead to creativity. For example, Amabile and colleagues (2005) reported that the experience of positive affect was positively related to creativity, whereas George and Zhou (2002) found that negative affect was positively related to creativity when participants were motivated by extrinsic rewards. Similarly, other researchers found that negative affect leads to higher levels of creativity through higher levels of persistence on creative tasks (Binnewies & Wörnlein, 2011; De Dreu, et al., 2008). Although these findings seem to indicate that both positive and negative affective experiences may lead to creativity, some scholars have pointed out that the role of affect in relation to creativity is even more complicated than simply studying positive and negative affective
experiences. Specifically, Fong (2006) found that neither positive nor negative emotions had a main effect on creativity, whereas emotional ambivalence (the simultaneous experience of positive and negative affective states) was found to facilitate creativity. Further, Baas and colleagues (2008) conducted a meta-analysis with the purpose to provide some clarity on these ambiguous findings and found that the experience of positive emotions related to more creativity than did the experience of neutral emotions, whereas negative emotions were not associated with creativity. However, when differentiating these emotions into activating and deactivating states, the authors found that activating negative mood states were conducive to creativity.

1.13 The Moderating Effects of Affect on Goal Orientations and Creative Self-Efficacy

I previously argued that individuals with learning orientations tend to seek challenges, use complex learning strategies, and persevere in the face of failure (Bell & Kozlowski, 2008). Further, individuals endorsing learning orientations generally establish challenging objectives and are not overly anxious about the failure or success of the outcome because they are more interested in the process of learning than in the outcome of the process (Brett & VandeWalle, 1999; Dweck & Leggett, 1988). Because learning orientations are grounded in the belief that ability is malleable (Dweck, 1986), individuals endorsing learning orientations are primarily concerned with developing domain specific competences and skills which ultimately lead to higher levels of creative self-efficacy (Farmer & Tierney, 2004). Drawing from the three components of Amabile’s (1996) Componential Theory of Creativity, I argue that goal orientations and creative self-efficacy account for two of the three vital components of creativity. Specifically, goal orientations encourage or discourage the development or learning of domain relevant skills, while creative self-efficacy engenders intrinsic task motivation. I contend here
that the third component (i.e., creativity relevant processes, or affective states) exerts its effects by acting as a moderator on the two former components.

Building on this positive association between learning orientations and creative self-efficacy, I contend that accumulation of activating affective states (e.g., happy, angry, excited) will lead to higher levels of creative self-efficacy. Specifically, I argue that activating affective states (i.e., high arousal) may act as a trigger to engage in creative tasks while the valence of these affective states may influence the type of thinking style used (i.e., positive = divergent, negative= convergent). For an individual who is already high in learning orientations and hence focused on the cultivation of creative self-efficacy, experiencing activating affective states is likely to further boost this positive relationship (Hirst et al., 2009; Gong et al., 2009). At the same time, the valence component of these activating affective states might signal whether an individual has sufficient resources at his/her disposal to engage in creative tasks and potentially build creative self-efficacy. Specifically, I argue that the divergent thinking style induced by a positive affective state signals the availability of sufficient resources to approach a certain outcome (i.e., creativity), whereas the convergent thinking style induced by a negative affective state may signal that the lack of requisite resources to accomplish a task (Schwarz, 1990). As a consequence, accumulations of activating and positive affective states (e.g., HAPA) will lead to accumulations of divergent thinking which will interact with learning orientations to create even higher levels of creative self-efficacy. In contrast, accumulations of low activation and negative affect (e.g., LANA) will lead to accumulations of convergent thinking which will interact with learning orientations to create even lower levels of creative self-efficacy. From the reasoning above, I hypothesize:
Hypothesis 11a: An accumulation of High Activation Positive Affect (HAPA) over time moderates the positive relationship between an accumulation in learning orientation and an accumulation in creative self-efficacy over time. More specifically, this relationship is mediated by an accumulation in divergent thinking over time.

Hypothesis 11b: An accumulation of Low Activation Negative Affect (LANA) over time moderates the negative relationship between an accumulation in learning orientation and an accumulation in creative self-efficacy over time. More specifically, this relationship is mediated by an accumulation in convergent thinking over time.

In contrast, individuals high in avoid orientation are motivated to avoid creative tasks as they imply a high chance of failure and thus, a higher chance of receiving criticism which they are averse to (VandeWalle, 1997). For instance, Bell and Kozlowski (2008) found that individuals high on avoid orientation have a greater propensity to withdraw from tasks (especially in the face of failure), are less interested in difficult tasks and have the tendency to seek less challenging tasks. As a corollary, because individuals high on avoid orientation are averse to engaging in creative tasks, I do not expect affective states to act as a moderator between creative-self efficacy and avoid orientations.

1.14 The Moderating Effects of Affect on Creative Self-Efficacy and Creativity

Moreover, I suspect that affect may also moderate the relationship between creative self-efficacy and creativity through a similar mechanism based on Amabile’s (1986) Componential Theory of Creativity. Specifically, Amabile (1986) argues that creative endeavors require some internal sustaining force that propels individuals to persevere in the face of challenges inherent in creative work. Creative self-efficacy appears to provide such momentum in that strong efficacy beliefs enhance the persistence level and the coping efforts individuals will demonstrate when
encountering challenging situations (Bandura, 1997). Since creative self-efficacy is defined as the belief that one has the ability to produce creative outcomes (Tierney & Farmer, 2004), I contend that affective states may act as a trigger to provide an additional boost of motivation to engage in creative tasks. Similar to the previous hypothesis I argue that the third component of creativity, creative relevant processes (e.g., affective states), exert their effects by moderating the other two components (e.g., domain relevant and intrinsic task motivation; Amabile, 1996). More specifically, I argue that accumulations of activating affective states will energize individuals to continue to pursue creative tasks, resulting in even higher levels (i.e., accumulation) of creativity (Warr et al., 2014). Further, I argue that the valence component of these activating affective states will influence the cognitive processing of individuals such that the experience of increasing levels of positive affect will result in even higher levels of creativity through greater levels of divergent thinking. In contrast, the experience of increasing levels of negative affect will dependent on the level of activation in such a way that an accumulation of high activation negative affect will result in a further increase in creativity, while an accumulation of low activation negative affect will result in a further decrease in creativity.

As previously stated, positive affect tunes individuals to engage in top-down processing whereby individuals are less systematic in their thinking, rely on pre-existing schemas (heuristics) which allows them to be more integrative, playful and expansive in their thinking (Divergent thinking; Bless & Schwarz, 1999; Clore et al., 2001). As a corollary, regardless of the activation level of an affective state, I contend that an accumulation of positive affect will be positively related to a further increase in creativity. On the other hand, negative affect tunes individuals to engage in bottom-up processing, such that individuals are more analytical and systematic in their thinking, resulting in greater perseverance and effort when pursuing creative
tasks (Convergent thinking; Schwarz, 1990). As a consequence, individuals who are experiencing increasingly high levels of activation and negative affect are believed to be energized by the motivational force provided by the activating affective state (Warr et al., 2014) and are more perseverant in pursuing creative tasks as a result of experiencing an accumulation in negative affect (Schwarz, 1990). However, when an individual experiences low levels of activation and negative affect (e.g., gloomy), the lack of motivational force from the low activation compiled with the convergent thinking style from negative affect may be detrimental to creativity. In sum, I argue that accumulations of activating and positive affective states (e.g., HAPA) will lead to accumulations of divergent thinking which will interact with creative self-efficacy and result in even higher levels of creativity. In contrast, experiencing accumulations of low activation and negative affect states (e.g., LANA) will lead to accumulations of convergent thinking which will interact with creative self-efficacy and result in even lower levels of creativity. An exception to this rule is that accumulations of high activation and negative affect (e.g., HANA) will lead to accumulations of convergent thinking, but, the activation level will energize individuals to continue to pursue creative tasks. Thus, I contend that HANA will positively moderate the relationship between creative self-efficacy and creativity.

_Hypothesis 12a: An accumulation of High Activation Positive Affect (HAPA) over time moderates the positive relationship between an accumulation of creative self-efficacy and an accumulation of creativity over time. More specifically, this relationship is mediated by an accumulation in divergent thinking over time._
Hypothesis 12b: An accumulation of Low Activation Negative Affect (LANA) over time moderates the negative relationship between an accumulation of creative self-efficacy and an accumulation of creativity over time. More specifically, this relationship is mediated by an accumulation in convergent thinking over time.

Hypothesis 12c: An accumulation of High Activation Negative Affect (HANA) over time moderates the positive relationship between an accumulation of creative self-efficacy and an accumulation of creativity over time. More specifically, this relationship is mediated by an accumulation in convergent thinking over time.

1.15 Dual Tuning and Hyper-Charging Creativity

The dual tuning perspective on affective states contends that positive and negative affect tune organizational members to respond appropriately to the changing landscape of organizational life and thus, should be considered in tandem (George 2011; George & Zhou, 2007). In a recent study, George and Zhou (2007) demonstrated that employees exhibited the highest levels of creativity when both positive and negative affect were high, and when supervisors built a supportive context by providing developmental feedback and by being trustworthy or providing interactional justice. Similarly, Bledow, Schmitt, Frese, and Kühnel (2011) examined employees who experienced affective shifts throughout their workday and found that when employees experienced an episode of negative affect followed by positive affect, their creativity levels were the highest. Although previous research has found that an interaction between positive and negative affect leads to higher levels of creativity, it does not distinguish between the arousal component of affective states (De Dreu et al., 2008). Extending the Dual-Tuning Theory (George & Zhou, 2002), I posit that individuals who are experiencing both positive and negative activating affective states (e.g., HAPA and HANA) will experience an
even higher level of creative output (Bledow, Rosing, & Frese, 2013; George & Zhou, 2007). As argued previously, drawing from the Circumplex Model of Emotions (Warr et al., 2014), I contend that the activation component of affective states will act as a trigger to motivate individuals towards creative tasks. Recent findings by George and Zhou (2007) found that both positive and negative affect indeed resulted in higher levels of creativity, demonstrating that both affective states interact. Extending these findings and accounting for the role of time, I contend that as individual’s experience accumulations of both positive and negative activating states over time, they will be more energized and motivated towards pursuing creative tasks. I thus propose the following hypothesis:

**Hypothesis 13a:** An accumulation of High Activation Affective states (HAPA and HANA) over time moderates the positive relationship between an accumulation of learning orientations and an accumulation of creative self-efficacy over time.

**Hypothesis 13b:** An accumulation of High Activation Affective states (HAPA and HANA) over time moderates the positive relationship between an accumulation of creative self-efficacy and an accumulation of creativity over time.
CHAPTER TWO: METHODS

2.1 Procedure

I used an experience sampling methodology and sampled participants once a day over a period of ten days to test the hypotheses presented above. Experience sampling methodology is ideally suited to account for the temporal context underlying respondents’ affective states, cognitions, and behaviors in their everyday work environment (e.g., Beal, 2011; Fisher & To, 2012). Thus, this interval-contingent experience sampling methodology provides an accurate record of work events, affective states, cognitions and behaviors, and minimizes retrospection bias (Reis & Wheeler, 1991). One of the primary concerns associated with experience sampling methodology pertains to keeping participants committed to repeatedly respond to short surveys. To address this issue, I minimized the length of the daily surveys by using shortened scales to avoid endangering the compliance of respondents (Fisher & To, 2012).

A period of ten days was chosen because previous research has demonstrated that the antecedents in question can change over a period of hours (affect; Bledow et al, 2011), days (goal orientations and creativity; DeShon & Gillespie 2005). It is important to reinforce the definition of creativity at this point. In this study, creativity is defined as a process that is continuously occurring. By this definition, it can be argued that all employees are engaged in the creative process—however, employees within specific jobs and roles that are given more autonomy will be more apt to display the creative process. This is important because the time period which the study will occur will require employees to express the creativity process more often, in order for it to be captured over a period of ten days.
To ensure the process of creativity could be captured, I identified companies that valued a creative workforce by developing a list of companies that put creativity and innovation as one of its top organizational values. Further, I contacted each companies human resource departments to inquire about their willingness to support a scientific study on workplace performance. Working with human resources, participants were qualified for the study only if their job roles required creativity, or the development of new and useful ideas. The qualifying job roles included: software engineers, management, R&D, consultants and etc. Across all participating companies, these roles were identified to have the highest autonomy on the job and required the highest level of problem solving ability. Most importantly, human resources identified that within these job roles, creativity was a crucial part of job performance. This is because job performance within these roles require employees to constantly develop new and novel solutions during their day-to-day work. For example, software engineers in this sample are tasked with the development of new features for the respective company’s products. This involves thinking of novel algorithms to optimize product performance.

Once job roles that required creativity were identified, I asked the human resource manager(s) to distribute the surveys to employees working the respective positions. As an incentive, I offered feedback on the results of the study to companies that contributed more than 10 employees (this service was only provided to companies who contributes more than 10 employees to minimizes the likelihood that anonymity may be compromised), and entered participants into a raffle for one out of six cash prizes of $150.

I first provided participants with a consent form and a pre-screen survey. I used the pre-screen survey to collect demographic information and information to ensure that creativity could be expressed on the job (e.g., level of routine on the job, industry experience). Next, I used daily
surveys for a 2-week period. According to Amabile & Pratt (2015), creativity is dynamic and occurs in the shortest temporal spans, from moment-to-moment, or over longer periods of time (e.g., days, weeks, months, years). The objective of the 2-week time frame was to capture the short term creativity process.

I provided respondents with individualized survey links near the end of the workday at 4PM and requested them to complete the survey on the same day before 11:59PM. I selected a 2-week period for daily surveys on the basis of the recommendation of Reis and Wheeler (1991), who contend that a 2-week record-keeping period represents a stable and generalizable estimate of social life. The daily survey took on average four minutes to complete and contained measures on goal orientations, creative self-efficacy, intrinsic motivation, affective states, thinking styles, and creativity. Because the proposed theoretical model pertains to the expression of creativity at the daily level, I modified survey items to include: “right now” or “today” (Ohly & Friz, 2010).

2.2 Respondents

The majority of the participating organizations extended from the technology industry (82%), followed by the financial industry (10%) and education and management consulting industry (10%). The sample included a heterogeneous sample of 127 full-time employees holding a variety of professional jobs including: product development, marketing, R&D, software development, consultants and management. As mentioned previously, respondents were chosen based on whether their job roles required creativity to perform on the job. This would allow for the capture of the creativity process over the two-week period of analyses.

The unit of analysis is “daily surveys” rather than “respondents”, resulting in an effective sample size of 711 observations (127 respondents x 5.6 average completed surveys per respondents). Respondents were, on average, 35.60 years old ($SD = 8.75$), 58% were female, and
77% held a university degree. Participants’ average experience in their respective industry was 9.02 years ($SD = 8.75$), only 37.55% of their job could be described as routine work ($SD = 22.01$), and the average company tenure was 2.74 years ($SD = 3.31$).

### 2.3 Measures

#### 2.3.1 Pre-screen survey
The pre-screen survey was administrated one week prior to the start of the daily prompts and was used to collect demographic information on respondents’ age (in years), gender (male or female), highest education level obtained, daily working hours, organizational tenure, and percent of routine in the job.

#### 2.3.2 Daily survey
Daily surveys were used to collect information on attitudes toward divergent or convergent thinking, goal orientations, creative self-efficacy, motivation, creativity, and affect. For each of these scales, I will not provide Chronbach’s alpha estimations of reliability because these tend to be biased when estimating reliability for nested data structures (Zinbarg, Yovel and Revelle, 2006). A more suitable reliability estimate for the current sample is the Omega reliability (for more information on Omega reliability, I refer the reader to: Macdonald, 1999).

#### 2.3.3 Attitudes Towards Divergent Thinking
was measured using a multi-factor scale containing 6 items for divergent thinking (e.g., preference for ideation) and 8 items for convergent thinking (e.g., tendency for premature critical evaluation of ideas) (Batasaur & Finkbeiner, 1985). I asked respondents to indicate the extent to which they agree with each statement on a 5-point Likert scale ranging from (1) “strongly disagree” to (5) “strongly agree”. An example item from the “preference for ideation” (divergent thinking) factor is: “I feel that all ideas should be given equal time and listened to with an open mind regardless of how zany they seem to be”, whereas an example item from the “tendency for premature critical evaluation of
ideas” (convergent thinking) factor is: “Quality is a lot more important than quantity in generating ideas”. The Omega reliability coefficient for the scales were $\omega = 0.85$, 95% CI [.81, .88], and $\omega = 0.84$, 95% CI [.82, .86], respectively.

### 2.3.4 Goal Orientations

were measured with a 10-item scale (VandeWalle, 1997). The scale is comprised of two factors: 1) learning orientations, and 2) avoid orientations. I asked respondents to indicate the extent to which they agree with each statement on a 6-point Likert scale ranging from (1) “strongly disagree” to (6) “strongly agree”. An example of the 6-item learning orientation scale is “I often look for opportunities to develop new skills and knowledge.” An example of the 4-item avoid orientation scale is “I’m concerned about taking on a task at work if my performance would reveal that I had low ability”. It is important to note that the original goal orientation (VandeWalle, 1997) scale includes a third factor; performance prove orientation. However, because previous studies have found null effects for performance prove orientations on creativity and this study did not explore hypotheses with regards to performance prove orientations, I have not measured this factor (Brett & VandeWalle, 1999; Fisher & Ford, 1998). The Omega reliability coefficient for the Learning Goal Orientation scale was $\omega = 0.91$, 95% CI [.89, .92] and $\omega = 0.92$, 95% CI [.90, .93] for the Performance Avoid Orientation Scale.

### 2.3.5 Creative Self-efficacy

was measured with a 3-item scale (Tierney & Farmer, 2002). I asked respondents to indicate the extent to which they feel that each statement describes how they feel about their current creative ability on a 7-point Likert scale ranging from (1) “very strongly disagree” to (7) “very strongly agree”. Sample items include “I have confidence in my ability to solve problems creatively” and “I feel that I am good at generating novel ideas” ($\omega = 0.89$, 95% CI [.87, .91]).
2.3.6 **Multidimensional Work Motivation Scale** was measured with a 3-item scale (Gagne et al., 2015). I asked respondents to indicate “why they put effort into their current job”, on a 7-point Likert scale ranging from (1) “not at all” to (7) “completely”. An example item is: “The work I am doing right now is exciting” ($\omega = 0.93$, 95% CI [.91, .94]).

2.3.7 **Creative Performance** was measured with an adapted 5-item scale (Tierney et al., 1999). I asked respondents to indicate the extent to which they feel that they have engaged in a set of behaviors using a 5-point Likert scale ranging from (1) “strongly disagree” to (5) “strongly agree”. Sample items include: “I generated novel, but operable work related ideas” and “I served as a good role model for creativity” ($\omega = 0.88$, 95% CI [.86, .90]).

2.3.8 **Multi-Affective States** were measured with the 16-item multi-affect scale (Warr et al., 2014). I asked respondents to indicate the extent to which they felt each of the on a 5-point Likert scale ranging from (1) “minimally or not at all” to (5) “to a very great extent”. HANA is measured by anxious, nervous, tense and worried ($\omega = 0.91$, 95% CI [.89, .93]); HAPA is measured by enthusiastic, excited, inspired and joyful ($\omega = 0.93$, 95% CI [.92, .94]); LANA is measured by dejected, depressed, despondent, and hopeless ($\omega = 0.90$, 95% CI [.87, .92]); LAPA is measured by ease, calm, laid-back, and relaxed ($\omega = 0.94$, 95% CI [.93, .95]).

2.4 **Data Analysis Strategy**

To accurately assess the theoretical model, I first need to understand how the proposed variables changes over time before characteristics of stability and change can be related to each other in a structural equation model (SEM). To start, I will estimate a univariate latent growth curve model (LGCM) to assess the complexity of change in the variables. Once I have determined how these variables change over time, I will then relate the growth parameters of one
variable to the growth parameters of another variable in a SEM (Andruff, Carraro, Thompson, Gaudreau, & Louvet, 2009; Preacher, Wichman, MacCallum, & Briggs, 2008).

2.4.1 Estimating Growth Parameters

Using univariate LGCMs, I will estimate growth parameters of each variable to determine whether there is statistically significant variance in each growth parameter. Since each variable was a repeated measure containing up to ten observations, LGCMs are a suitable method to examine patterns of change over time (Preacher et al, 2008). In order to test the complexity of the collected variables, I followed a step-wise approach recommended by Preacher and colleagues (2008). To assess model complexity, I will first fit an intercept only LGCM. Next, I will increase model complexity one growth parameter at a time: assessing the fits of slope, quadratic, and cubic growth parameters. I will take each successive step after evaluating whether 1) the model converged and 2) whether model comparisons indicated that further complexity is warranted. Following Preacher and colleagues’ (2008) guidelines for fitting LGCMs, I will fix the factor loadings of the intercept growth factor to each of the repeated measurement moments to 1.0, so that the intercept growth factor has equal influence across all ten repeated measures. For the slope growth factor, I will fix the factor loadings to increasing values from zero (first measure) to nine (tenth) measure to represent an increase over the course of all ten repeated measurement moments. Similarly, quadratic and cubic growth factors will be fixed to values that exponentially increase over the ten repeated measurement moments.

To determine the best fitting growth parameters for each variable, I will use the following fit indices and cutoff values as recommended by Dyer, Hanes and Hall (2005): Root Mean Square Error of Approximation (RMSEA) with a cutoff value of .05 or lower, Comparative Fit Index (CFI), with a cutoff value of .95 or higher, Tucker Lewis Index (TLI) with a cutoff value
of .95 or higher, Standardized Root Mean Square Residual (SRMR) with a cutoff of .05 or lower. In addition, I will compare models using the Bayesian Information Criteria (BIC) and Sample Size adjusted Bayesian Information Criteria (ABIC), with lower levels of BIC and ABIC suggesting a better model fit.

After having identified the best fitting univariate LGCM for each variable, I will save the growth parameters of these LCGM’s using the SAVEDATA and SAVE=FSCORES command in Mplus 7.4 (Muthén & Muthén, 2012). By doing so, I can relate the variables’ growth parameters to each other in a SEM.

2.4.2 SEM: Relating Growth Parameters.

I will test the theoretical model by relating growth parameters as outlined in Figure 1. First, I will estimate the direct effect of learning goal orientations (LGO) and performance avoid orientations (PAO) on creative performance (CP) (Hypothesis 1 & 2). Then, using a product of coefficients approach (Preacher & Hayes, 2008), I will estimate the indirect effect of goal orientations (LGO & PAO) on CP through creative self-efficacy (CSE) (Hypothesis 3 & 4). Following, I will estimate the direct effect of CSE on intrinsic motivation (MOT) (Hypothesis 5) and the direct effect of MOT on CP (Hypothesis 6). Then, I will model the indirect effect of CSE on CP via MOT (Hypothesis 7 & 8). Finally, I will test the entire motivational model by entering goal orientations LGO & PAO as the independent variable and CP as the dependent variable, using CSE and MOT as mediators (Hypothesis 9a, 9b).

Similarly, to test the affective component of the theoretical model, I will first begin by examining the direct relationship between positive affective states (HAPA & LAPA) and divergent thinking (DVT) (Hypothesis 10a) and negative affective states (HANA &LANA) on convergent thinking (CVT; Hypothesis 10b). Hypothesis 11a-13b propose that affect states will
act as mediated moderators. I will follow the advice of Edwards and Lambert (2007) to simultaneously test mediation and moderation effects. That is, to examine whether a moderating effect is mediated, I will construct a bias-corrected confidence interval by drawing 10,000 random samples with replacement from the full sample. An indirect effect is significant when the 95% confidence interval excludes zero (Edwards & Lambert, 2007). Specifically, to test hypothesis 11A, I will first assess whether HAPA and DVT moderate the relationship between LGO and CSE independently. Then, I will assess the relationship between HAPA and DVT. If these relationships are significant, then I will test simultaneous mediation and moderation effects as discussed above. Similarly, to test hypothesis 11b, I will first assess whether LANA and CVT moderate the relationship between LGO and CSE independently. Afterwards, I will assess the relationship between LANA and CVT. If these relationships are significant, I will test for mediated moderation effects.

The same methods will be used to test hypothesis 12a, 12b and 12c. For hypothesis 12A, I will assess the moderating effect of HAPA and DVT on the relationship between CSE and CP. Next, I will assess the relationship between HAPA and DVT. If these relationships are significant, I will continue to test mediated moderation effects. Similarly, for hypothesis 12B, I will test whether HANA and CVT independently moderate the relationship between CSE and CP. Following, I will assess the relationship between HANA and CVT. If these relationships are significant, I will continue with testing mediated moderation effects. Finally, for hypothesis 12C, I will assess whether LANA and CVT moderate the relationship between CSE and CP independently. Then, I will assess the relationship between LANA and CVT. If these relationships are significant, I will examine mediated moderation effects.
Finally, I will test the dual tuning hypothesis (Hypothesis 13a/13b) by creating an interaction term between HAPA and HANA, and examine its moderation effects on the previously mentioned paths, LGO to CSE and CSE to CP, respectively.

2.4.3 Competing Models Analysis

As discussed previously, the literature suggests that affective states result in creativity through changes in thinking states. Thus, I had hypothesized that affect would moderate the relationship between LGO and CSE and that affect would moderate the relationship between CSE and CP. To determine the appropriate mechanism to which affect enacts itself, I will use a competing models analysis. Specifically, I will examine three competing models whereby affective states will be tested on two different paths (see Figure 2). Because these competing models are not nested, I will follow the recommendations of Schermelleh-Engel, Werner, Klein, and Moonsbrugger (2010) and start by testing a parent model (i.e., theoretical model, see Figure 2) in which the following moderators will be tested on the relationship between goal orientations and creative self-efficacy: HAPA, HANA, LANA, HAPA*HANA, and will moderate the relationship between creative self-efficacy and creativity. Next, I will compare the model fit indicators of this parent model to a model in which HAPA, HANA, LANA, HAPA*HANA only moderates the relationship between goal orientations and creative self-efficacy. Next, I will also compare the model fit indicators of the parent model to another model in which HAPA, HANA, LANA, HAPA*HANA only moderates the relationship between creative self-efficacy and creativity. I will follow suggestions of Dyer, Hanges, and Hall (2005) to assess the best fitting competing models. Specifically, I will use the sample size adjusted BIC and SRMR because they are both appropriate for analyzing within-subject data in multilevel models. Moreover, SRMR is the only indicator that allows comparison of model fit in multilevel models as it provides both
within and between estimates (Dyer et al., 2005). I will grand mean center all independent and moderating variables as it will aid in interpreting the result by providing a meaningful x-intercept interpretation (e.g., the mean value. Moreover, it may reduce issues dealing with multicollinearity (Hofmann, Gavin, Mark, 1998).
CHAPTER THREE: RESULTS

3.1 Assessment of Respondent Attrition

A moderate degree of response attrition occurred over the daily 10 measurement occasions, resulting in an average of 5.6 completed surveys per respondent over the course of the study. To alleviate concerns about sampling bias (Goodman & Blum, 1996), I conducted a multiple logistic regression using a dichotomous outcome variable to distinguish between low responders (5 surveys and less, below the mean) and high responders (5 or more completed surveys, average or above). I used demographic variables as predictors of whether participants responded to more than 5 surveys or less than 5 surveys. No variable was significant, indicating that the probability of being a high responder as opposed to a low responder is not dependent on the measured demographic characteristics. I conclude that the data are missing at random per these variables (Little & Rubin, 1987) and that no meaningful sampling bias exists due to the longitudinal nature of the data collection.

3.2 Assessment of Construct Validity

I examined construct validity through a series of multi-level confirmatory factor analyses (MCFA) and assessed model fit according to recommendations by Dyer, Hanes and Hall (2005). I first tested the theoretical eleven factor model where each variable was specified as a latent construct represented by its corresponding scale items and found acceptable fit ($\chi^2$ (df): 3096 (1694), RMSEA= .04, CFI= .92, TLI = .91, SRMR$_{within}$ = .05, SRMR$_{between}$= .08). I compared the measurement model with twelve alternative models. In the first model, I addressed the concern that CSE and CP may overlap and loaded their items onto one separate latent factor (Model A). I continued to test all other alternative solutions by loading CSE and MOT on a separate latent factor (Model B), loading CSE, MOT and CP on a separate latent factor (Model C), loading
LGO and PAO on a separate latent factor (Model D), loading CVT and DVT on a separate factor (Model E). Similarly, I examined the affective components of the model by loading all of the four affective measures (e.g., HAPA, LAPA, HANA, LANA) onto a separate factor (Model F). Then decomposed this further by loading HANA and LANA onto a single factor and HAPA and LAPA onto a single factor (Model G). Similarly, I loaded HANA and LANA onto a single factor (Model H), HAPA and LAPA onto a single factor (Model I), HANA and HAPA onto a single factor (Model J), LANA and LAPA onto a single factor (Model K). Finally, I tested for convergent validity by loading all items onto a single common factor (Model L).

Using Loglikelihood ratio tests, I compared the measurement model to the alternative models to determine the best fit. The results revealed that the theoretical model fit the data the best: \( \Delta \chi^2 (20) = 155.5, p < .001 \) (Model A); \( \Delta \chi^2 (20) = 743.14, p < .001 \) (Model B); \( \Delta \chi^2 (38) = 894.25, p < .001 \) (Model C); \( \Delta \chi^2 (20) = 1287.57, p < .001 \) (Model D); \( \Delta \chi^2 (20) = 611.41, p < .001 \) (Model E); \( \Delta \chi^2 (54) = 1445.09, p < .001 \) (Model F); \( \Delta \chi^2 (38) = 2184.46, p < .001 \) (Model G); \( \Delta \chi^2 (20) = 951.93, p < .001 \) (Model H); \( \Delta \chi^2 (20) = 1296.41, p < .001 \) (Model I); \( \Delta \chi^2 (20) = 1159.95, p < .001 \) (Model J); \( \Delta \chi^2 (20) = 1205.86, p < .001 \) (Model K); \( \Delta \chi^2 (110) = 9501.23, p < .001 \) (Model L). The results are summarized in Table 1A below.
Table 1A
*CFA Results for Theoretical and Alternative Measurement Models*

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$ (df)</th>
<th>RMSEA</th>
<th>CFI</th>
<th>TLI</th>
<th>SRMR_{within}</th>
<th>SRMR_{between}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theoretical model</td>
<td>3096.30 (1694)</td>
<td>.04</td>
<td>.92</td>
<td>.91</td>
<td>.05</td>
<td>.08</td>
</tr>
<tr>
<td>Alternative Model A</td>
<td>3251.80(1714)</td>
<td>.04</td>
<td>.91</td>
<td>.91</td>
<td>.04</td>
<td>.08</td>
</tr>
<tr>
<td>Alternative model B</td>
<td>3839.44(1714)</td>
<td>.04</td>
<td>.88</td>
<td>.87</td>
<td>.08</td>
<td>.17</td>
</tr>
<tr>
<td>Alternative model C</td>
<td>3990.55(1732)</td>
<td>.05</td>
<td>.87</td>
<td>.86</td>
<td>.08</td>
<td>.15</td>
</tr>
<tr>
<td>Alternative model D</td>
<td>4383.87(1714)</td>
<td>.05</td>
<td>.85</td>
<td>.84</td>
<td>.08</td>
<td>.17</td>
</tr>
<tr>
<td>Alternative Model E</td>
<td>3707.71(1714)</td>
<td>.43</td>
<td>.88</td>
<td>.88</td>
<td>.05</td>
<td>.09</td>
</tr>
<tr>
<td>Alternative Model F</td>
<td>4541.39(1748)</td>
<td>.05</td>
<td>.84</td>
<td>.83</td>
<td>.08</td>
<td>.16</td>
</tr>
</tbody>
</table>

*Note. N = 630.*

Theoretical model: HANA, HAPA, LANA, LAPA, LGO, PAO, CP, MOT, CSE, DVT all load onto their respective latent factors; Alternative Model A: CSE and CP load onto one latent factor; Alternative Model B: CSE and MOT load onto one latent factor; Alternative Model C: CSE, MOT and CP on a separate latent factor; Alternative Model D: LGO and PAO on a separate factor; Alternative Model E: CVT and DVT load onto one latent factor; Alternative Model F: HANA, HAPA, LAPA and LANA load onto a separate factor.
Table 1A continued.

*CFA Results for Theoretical and Alternative Measurement Model*

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$ (df)</th>
<th>RMSEA</th>
<th>CFI</th>
<th>TLI</th>
<th>SRMR\textsubscript{within}</th>
<th>SRMR\textsubscript{between}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative Model G</td>
<td>5280.76(1732)</td>
<td>.06</td>
<td>.80</td>
<td>.78</td>
<td>.09</td>
<td>.20</td>
</tr>
<tr>
<td>Alternative Model H</td>
<td>4048.23(1714)</td>
<td>.05</td>
<td>.87</td>
<td>.86</td>
<td>.06</td>
<td>.23</td>
</tr>
<tr>
<td>Alternative Model I</td>
<td>4392.71(1714)</td>
<td>.05</td>
<td>.85</td>
<td>.84</td>
<td>.09</td>
<td>.13</td>
</tr>
<tr>
<td>Alternative Model J</td>
<td>4256.25(1714)</td>
<td>.05</td>
<td>.88</td>
<td>.84</td>
<td>.08</td>
<td>.17</td>
</tr>
<tr>
<td>Alternative Model K</td>
<td>4302.16(1714)</td>
<td>.06</td>
<td>.83</td>
<td>.87</td>
<td>.09</td>
<td>.15</td>
</tr>
<tr>
<td>Alternative Model L</td>
<td>12597.53(1804)</td>
<td>.10</td>
<td>.40</td>
<td>.37</td>
<td>.16</td>
<td>.43</td>
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</tbody>
</table>

*Note. N = 630.*

*Alternative Model G:* HANA and LANA load onto one factor, HAPA and LAPA onto another separate factor; *Alternative Model H:* HANA and LANA onto a single factor; *Alternative Model I:* HAPA and LAPA onto a single factor; *Alternative Model K:* LANA and LAPA onto a single factor; *Alternative Model L:* All items load onto a single factor.
3.3 Descriptive Statistics

Table 2A presents within-person (at the level of observations; N = 630) and Table 2B presents between-person (at the level of employees, N = 127) means, standard deviations, and correlations among the study variables.
Table 2A.

**Means, Standard Deviations, and Internal Consistency reliabilities for Order 1 variables (Within-Subject)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Gender</th>
<th>Age</th>
<th>Hours Worked</th>
<th>Tenure</th>
<th>Industry Exp</th>
<th>Routine (%)</th>
<th>HANA</th>
<th>HAPA</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>127</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>127</td>
<td>35.60</td>
<td>8.75</td>
<td>-.20**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours Worked</td>
<td>127</td>
<td>43.10</td>
<td>8.80</td>
<td>.06</td>
<td>.06</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenure</td>
<td>127</td>
<td>2.74</td>
<td>3.31</td>
<td>-.06</td>
<td>.32**</td>
<td>.13**</td>
<td></td>
<td></td>
<td></td>
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<td>.05</td>
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<td>-.30** (.93)</td>
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</table>

Note: Omega Reliability appear on the diagonal in parentheses.

* Male = 1, Female = 2.

**p < 0.01 * p < 0.05

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Table 2A continued.

*Means, Standard Deviations, and Internal Consistency reliabilities for Order 1 variables (Within-Subject)*

<table>
<thead>
<tr>
<th>Variables</th>
<th>LANA</th>
<th>LAPA</th>
<th>LGO</th>
<th>PAO</th>
<th>CP</th>
<th>MOT</th>
<th>CSE</th>
<th>DVT</th>
<th>CVT</th>
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<td>.27**</td>
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<td>.13**</td>
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<td>.03</td>
<td>-.09**</td>
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<td>.05</td>
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<td>-.06</td>
<td>-.11**</td>
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*Note.* Omega Reliability appear on the diagonal in parentheses.

a Male =1, Female = 2.

**p < 0.01  * p < 0.05

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**Means, Standard Deviations, and Internal Consistency reliabilities for Order 1 variables (Within-Subject)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
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<th>SD</th>
<th>LANA</th>
<th>LAPA</th>
<th>LGO</th>
<th>PAO</th>
<th>CP</th>
<th>MOT</th>
<th>CSE</th>
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<th>CVT</th>
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<td>(.94)</td>
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<td>.47**</td>
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<td>-.21**</td>
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<td>-.21**</td>
<td>(.84)</td>
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</table>

*Note.* Omega Reliability appear on the diagonal in parentheses.

*a* Male =1, Female = 2.
**p < 0.01  * p < 0.05

HANA: High Activation Negative Affect; HAPA: High Activation Positive affect; LANA: Low Activation Negative Affect
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Table 2B

Means, Standard Deviations, and Internal Consistency reliabilities for Order 1 variables (Between-Subject)

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Gender</th>
<th>Age</th>
<th>Hours Worked</th>
<th>Tenure</th>
<th>Industry Experience</th>
<th>Routine (%)</th>
<th>HANA</th>
<th>HAPA</th>
</tr>
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<tbody>
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<td></td>
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<td></td>
<td></td>
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<td>-0.11</td>
<td>-0.06</td>
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</tr>
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</table>

Note. Omega Reliability appear on the diagonal in parentheses.

a Male = 1, Female = 2.

** p < 0.01  * p < 0.05

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Table 2B continued

Means, Standard Deviations, and Internal Consistency reliabilities for Order 1 variables (Between-Subject)

<table>
<thead>
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<th>Variables</th>
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<th>LGO</th>
<th>PAO</th>
<th>CP</th>
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<th>CVT</th>
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<td>.09</td>
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<td>.61**</td>
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</table>

Note. Omega Reliability appear on the diagonal in parentheses.

* Male = 1, Female = 2.

** p < 0.01  * p < 0.05

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Table 2B continued

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<table>
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<th>Variables</th>
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<th>SD</th>
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<th>LGO</th>
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<th>CP</th>
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<tr>
<td>CSE</td>
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<td>1.02</td>
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<td>.32**</td>
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<td>(.89)</td>
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<tr>
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<td>.16</td>
<td>.23*</td>
<td>.14</td>
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<td></td>
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<tr>
<td>CVT</td>
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<td>.81</td>
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<td>-.24**</td>
<td>-.21*</td>
<td>-.34**</td>
<td>(.84)</td>
</tr>
</tbody>
</table>

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** p < 0.01  * p < 0.05

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3.4 LGCM: Assessment of Change

To assess the level of complexity of each variable’s LGCM, I specified separate univariate LGCM’s for each focal variable with only an intercept (i.e., no change over time) as the latent growth factor to describe mean differences between individuals. Next, progressing in a stepwise manner, I included a slope, quadratic, and then a cubic term to understand the rates of change and to understand the functional form of change, respectively. None of the variables produced acceptable model fits for the intercept, slope or quadratic growth parameters (see Table 7A, 7B and 7C in the appendix for a full report on the fit indices). Essentially, the data across the 10-day measurement period was too erratic to be quantified even at the intercept level. Research involving affect spillover suggests that current work day affect can be carried over to the following work day—however, other authors argue that work affect essentially “resets” on a daily basis (Sonnentag & Binnewies, 2013; Rothbard & Wilk, 2011). Given these conclusions and the current results, I decided to analyze the data by weeks: week 1 (5 measurements) and week 2 (5 measurements) because the weekend may have presented an opportunity for individuals to “reset”. This was evidenced by the poor model fits and lack of an intercept fit—the data over a two-week period were too erratic to be fitted to an intercept only model, suggesting a discontinuous change over time. An alternative strategy that is outside of the scope of the current study is to examine an alternative set of hypotheses using discontinuous growth models, which would be more suitable for data displaying such behavior.

Separating the data by week ameliorated the issue. The best fitting intercept-only univariate LGCMs for week 1 data are as follows: LGO (RMSEA = 0.00, CFI = 1.00, TLI = 1.00, SRMR = .03), PAO (RMSEA = 0.02, CFI = 0.98, TLI = 0.99, SRMR = 0.11), CSE (RMSEA = 0.06, CFI = 0.94, TLI =0.95, SRMR = .09), MOT (RMSEA = 0.00, CFI = 1.00, TLI
= 1.00, SRMR = 0.06), CP (RMSEA = 0.04, CFI = 0.95, TLI = 0.96, SRMR = 0.13), HAPA (RMSEA = 0.00, CFI = 1.00, TLI = 1.00, SRMR = .09), HANA (RMSEA = .07, CFI = .90, TLI = .93, SRMR = 0.15), LAPA (RMSEA = .07, CFI = .92, TLI = .94, SRMR = .11), LANA (RMSEA = .06, CFI = .94, TLI = 0.96, SRMR = 0.14). Overall, the RMSEA, CFI and TLI indices demonstrate adequate fit in accordance to recommendations by Dyer and colleagues (2005). However, SRMR for a number of the models are below threshold value. Beauducel & Wittmann (2005) argue that under varying data conditions, thresholds for approximate fit indices were impossible to set without misidentification. Moreover, Hooper, Coughlan & Mullen (2008) report that SRMR will be higher when there is a low number of parameters. Given these findings, I apply a more liberal threshold to the SRMR values and accept them as adequately fitting models. Similar fit statistics were replicated for week 2 data (see Table 7C in the appendix for a full report on week 2 fit indices). The results indicate that for each variable, an intercept model provided the best fit, suggesting that all of the variables changed between people but did not vary over time. This is problematic because the theoretical model was premised on dynamic changes over time. In the following section, I provide an alternative data analytic strategy as well as a revision to the proposed theoretical model and hypotheses.

3.5 Alternative Data Analysis Strategy

Because the proposed theoretical model is premised on change over time (e.g., significant slope or quadratic growth parameters) in creativity and its antecedents, I am unable to continue testing these specific hypotheses because the results indicated that the measured variables did not significantly change over the course of a week. As such, I chose to take an alternative approach and examine the intercept-only growth parameters in an SEM; a between subject approach. The same theoretical model will be tested, with the exception that hypotheses can only support static
relationships as opposed to the originally proposed dynamic relationships. Moving forward, I saved the intercept-only growth parameters for each variable using the SAVEDATA and SAVE=FSCORES command in Mplus 7.4 (Muthén & Muthén, 2012). These growth parameters were then used to relate each variable to each other in an SEM.

3.6 SEM: Testing the Theoretical Model

Using the intercept growth parameters from the LGCM, I specified three models and compared them using the -2Log Likelihood (-2LL) difference test (Hayes, 2006) to find the best fitting model as proposed in the competing models section of the methods section. To begin, I tested the full theoretical model by specifying the proposed mediation model (CP regressed onto LGO and PAO via CSE and MOT), and added the main effects of HAPA, HANA, LANA and DVT, in addition to the proposed interaction terms: LGO*HAPA, LGO*DVT, LGO*HANA, LGO*CVT LGO*HAPA*HANA, LGO*HAPA*DVT, LGO*LANA*CVT as moderators on the relationship between LGO and CSE. All variables except for the dependent variable were grand mean centered. Grand mean centering aids in the interpretation of the results as it provides a meaningful x-intercept interpretation (e.g., the mean value). Moreover, it may reduce issues dealing with multicollinearity (Hofmann, Gavin, Mark, 1998). These same moderators were also added to the indirect relationship between CSE and CP, with the exception that the first part of the interaction term had been changed from LGO to CSE, respectively. To provide further clarity before discussing the partial models, I will henceforth refer to the moderators (e.g., HAPA, HANA, LANA, DVT, CVT and their interaction terms) as the affective state moderators. In the full theoretical model, the affective state moderators were added as moderators between the LGO and CSE relationship and the indirect effect of CSE to CP (see Figure 2). Partial model 1 was specified similarly to the full theoretical model except that the affective state moderators were
removed from the relationship between CSE and CP. Conversely, partial model 2 was specified such that only the relationship between CSE and CP was moderated by the affective state moderators. The results of each model are summarized below by week, respectively.

Table 3A
*Testing Affective antecedents as moderators of the motivational model (week 1)*

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$ (df)</th>
<th>RMSEA</th>
<th>CFI</th>
<th>TLI</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Theoretical model</td>
<td>1042.34(45)</td>
<td>.046</td>
<td>0.00</td>
<td>-0.31</td>
<td>0.64</td>
</tr>
<tr>
<td>Partial Model 1</td>
<td>590.52(32)</td>
<td>0.41</td>
<td>0.00</td>
<td>-0.72</td>
<td>0.96</td>
</tr>
<tr>
<td>Partial Model 2</td>
<td>576.07(32)</td>
<td>0.40</td>
<td>0.26</td>
<td>0.24</td>
<td>0.24</td>
</tr>
</tbody>
</table>

*Note.* N = 630.

Table 3B
*Testing Affective antecedents as moderators of the motivational model (week 2)*

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$ (df)</th>
<th>RMSEA</th>
<th>CFI</th>
<th>TLI</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Theoretical model</td>
<td>676.40(45)</td>
<td>.051</td>
<td>0.00</td>
<td>-0.28</td>
<td>0.23</td>
</tr>
<tr>
<td>Partial Model 1</td>
<td>291.59(32)</td>
<td>0.44</td>
<td>0.00</td>
<td>-0.74</td>
<td>0.22</td>
</tr>
<tr>
<td>Partial Model 2</td>
<td>635.84(32)</td>
<td>0.44</td>
<td>0.26</td>
<td>0.24</td>
<td>0.40</td>
</tr>
</tbody>
</table>

*Note.* N = 630.

Results indicate that all models fitted the data extremely poor. According to Anderson and Gerbing (1984), CFI values of 0 and negative TLI values are not indications of inappropriate model convergence, but rather indicate that sample sizes are too small for proper estimation of
the model. Given these results, I took an alternative strategy to provide an appropriate test of the theoretical model.

3.7 SEM: Examining the Mediation Model

In order to appropriately test the theoretical model, I decided to reduce the complexity of the model by examining a mediation model independent of the mediated moderation hypotheses. Next, I will test the affective moderators as proposed in the theoretical model. To this end, I tested a total of five models and compared them using the \(-2\text{Log Likelihood (} -2\text{LL)}\) difference test (Hayes, 2006). Specifically, I first examined a fully mediated model in which I looked at the relationship between LGO and PAO and CP via CSE and MOT. In the second model, I included a direct path from CSE to CP. The third model included direct paths from LGO and PAO to MOT as well as the previous direct path from CSE to CP. Similarly, the fourth model was estimated with the same paths as the third model with the exceptions of the direct path from CSE to CP. Finally, the fifth model estimated direct paths from LGO, PAO and CSE to CP. According to Amabile (1988), organizational creativity depends on a number of factors including industry experience and routinization of one’s job. I therefore controlled for industry experience and routine by regressing the outcome variable CP onto these two variables. These analyses were repeated for data from week 2 in order to determine the stability of the theoretical model. The results are summarized in Tables 4a & 4b below.
Table 4A

*Week 1 Mediation Model Fit Statistics*

<table>
<thead>
<tr>
<th></th>
<th>ABIC</th>
<th>BIC</th>
<th>RMSEA</th>
<th>CFI</th>
<th>TLI</th>
<th>SRMR</th>
<th>Chi Square</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(df)</td>
</tr>
<tr>
<td>Full Model</td>
<td>892.84</td>
<td>938.12</td>
<td>0.32</td>
<td>0.48</td>
<td>.41</td>
<td>0.17</td>
<td>152.65(13)**</td>
</tr>
<tr>
<td>Partial 1</td>
<td>784.84</td>
<td>832.78</td>
<td>0.16</td>
<td>0.89</td>
<td>.86</td>
<td>0.11</td>
<td>42.65(12)**</td>
</tr>
<tr>
<td>Partial 2</td>
<td>773.32</td>
<td>826.59</td>
<td>0.13</td>
<td>0.94</td>
<td>.91</td>
<td>0.09</td>
<td>27.13(10)**</td>
</tr>
<tr>
<td>Partial 3</td>
<td>765.17</td>
<td>823.76</td>
<td>0.09</td>
<td>0.97</td>
<td>.95</td>
<td>0.09</td>
<td>14.98(8)</td>
</tr>
<tr>
<td>Partial 4</td>
<td>881.47</td>
<td>932.08</td>
<td>0.33</td>
<td>0.53</td>
<td>.36</td>
<td>0.16</td>
<td>137.28(11)**</td>
</tr>
<tr>
<td>Partial 5</td>
<td>776.64</td>
<td>829.91</td>
<td>0.14</td>
<td>0.92</td>
<td>.89</td>
<td>0.1</td>
<td>30.45(10)**</td>
</tr>
</tbody>
</table>

Note: p < .05 *, p< .001 **; All models were tested against Partial model 3.

Table 4B

*Week 2 Mediation Model Fit Statistics*

<table>
<thead>
<tr>
<th></th>
<th>ABIC</th>
<th>BIC</th>
<th>RMSEA</th>
<th>CFI</th>
<th>TLI</th>
<th>SRMR</th>
<th>Chi Square</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(df)</td>
</tr>
<tr>
<td>Full Model</td>
<td>752.22</td>
<td>790.92</td>
<td>0.35</td>
<td>0.48</td>
<td>.40</td>
<td>0.18</td>
<td>129.43(13)**</td>
</tr>
<tr>
<td>Partial 1</td>
<td>649.08</td>
<td>690.06</td>
<td>0.12</td>
<td>0.95</td>
<td>.93</td>
<td>0.10</td>
<td>24.29(12)**</td>
</tr>
<tr>
<td>Partial 2</td>
<td>650.78</td>
<td>696.31</td>
<td>0.13</td>
<td>0.95</td>
<td>.92</td>
<td>0.10</td>
<td>27.13(10)**</td>
</tr>
<tr>
<td>Partial 3</td>
<td>647.06</td>
<td>697.14</td>
<td>0.09</td>
<td>0.97</td>
<td>.95</td>
<td>0.09</td>
<td>14.98(8)</td>
</tr>
<tr>
<td>Partial 4</td>
<td>753.92</td>
<td>797.14</td>
<td>0.38</td>
<td>0.48</td>
<td>.29</td>
<td>0.18</td>
<td>137.28(11)**</td>
</tr>
<tr>
<td>Partial 5</td>
<td>645.35</td>
<td>690.89</td>
<td>0.10</td>
<td>0.96</td>
<td>.95</td>
<td>0.10</td>
<td>30.45(10)**</td>
</tr>
</tbody>
</table>

Note: p < .05 *, p< .001 **; All models were tested against Partial model 3.
Results indicate that partial model 3 was the best fitting model (ABIC/BIC = 765.17/823.76, RMSEA = .09, CFI/TLI = .97/.95, SRMR = .09 and ABIC/BIC = 765.17/823.76, RMSEA = .09, CFI/TLI = .97/.95, SRMR = .09, week 1 and week 2 respectively). The results for the mediation model (hypothesis 1a- 9a) are summarized by week, in Tables 5a & 5b. For the remainder of the section, I will present the results by week, with the first value representing week 1 and the second value representing week 2. All presented values are reported as unstandardized betas.

Hypothesis 1 predicts that LGO are positively related to CP whereas hypothesis 2 predicts that PAO are negatively related to CP. LGO was positively related to CP (β = .20, \( p < .001 \); \( β = .19, \ p < .001 \)), supporting hypothesis 1. However, PAO was not negatively related to CP (\( β = .05, \ p = .49 \); \( β = .06, \ p = .20 \)). Hence, no support was found for hypothesis 2.

Hypothesis 3 proposed that CSE mediates the positive relationship between LGO and CP. The indirect effect of LGO on CP via CSE was significant (\( β = .32, \ 95\% CI [.20, .46]; \ β = .74, \ 95\% CI [.32, .81] \)). Hypothesis 3 was thus supported. Similarly, hypothesis 4 predicts that PAO are negatively related to CP through CSE. The indirect effect of PAO on CP via CSE was also found to be significant (\( β = -.23, \ 95\% CI [-.35, -.12]; \ β = -.16, \ 95\% CI [-.28, -.04] \)). Hypothesis 4 was thus supported.

Hypothesis 5 predicted that CSE was positively related to MOT. However, no significant relationship was found in both samples (\( β = .30, \ p = .08; \ β = .34, \ p = .11 \)). Hence, no support was found for hypothesis 5.

Hypothesis 6 predicted that MOT is positively related to CP. MOT was positively related to CP (\( β = .02, \ p = .05; \ β = .07, \ p < .05 \)). Hence, hypothesis 6 was only partially supported (not in week 1).
Hypothesis 7 examines MOT as a mediator between CSE and CP. The indirect effect between CSE and CP via MOT ($\beta = .01$, 95% CI [-.01, .02]; $\beta = .02$, 95% CI [-.01, .07]) was not significant. Hypothesis 7 was not supported. Hypothesis 8 was a competing hypothesis that proposed that the mediating effect of MOT between CSE and CP would be negative. Given the previous results, hypothesis 8 was not supported.

Hypothesis 9a predicted that LGO is positively related to CP and that this relationship is positively mediated by CSE and MOT. LGO was not related to CP via CSE and MOT ($\beta = .01$, 95% CI [-.01, .02]; $\beta = .03$, 95% CI [-.01, .09]). Hence, hypothesis 9a was not supported.

Similarly, Hypothesis 9b predicts that PAO is negatively related to CP, and that the relationship is mediated by CSE and MOT. PAO was not related to CP via CSE and MOT ($\beta = .01$, 95% CI [-.01, .02]; $\beta = -.01$, 95% CI [-.01, .01]). Hence, hypothesis 9b was not supported.

Hypothesis 10a predicted that HAPA and LAPA was positively related to divergent thinking. In order to test this, I regressed divergent thinking onto HAPA and LAPA. HAPA was positively related to divergent thinking ($\beta = .15$, $p < .001$; $\beta = .14$, $p < .001$) while LAPA was not ($\beta = .07$, $p = .38$; $\beta = .01$, $p = .95$). Hypothesis 10a was partially supported.

Similarly, Hypothesis 10b predicts that HANA and LANA is positively related to convergent thinking. Neither HANA ($\beta = -.07$, $p = .43$; $\beta = -.017$, $p = .20$) nor LANA ($\beta = .23$, $p = .18$; $\beta = .01$, $p = .65$) was significant. Thus, hypothesis 10b was not supported.

Note that a number of hypotheses could be considered marginally significant as their confidence intervals do not include 0, which suggests that the p-value is equal or slightly less than .05. However, because these results were calculated using a bootstrapping approach, I take a more conservative stance and only considered relationships significant if they were below .05.
Table 5A

Summary of mediation model of motivational antecedents (week 1)

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>CSE</th>
<th>MOT</th>
<th>CP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine</td>
<td>.01 (.01)**</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Industry</td>
<td>.02 (.01)**</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Experience</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LGO</td>
<td>.74 (.11)**</td>
<td>.82 (.22)**</td>
<td>.20 (.06)**</td>
</tr>
<tr>
<td>PAO</td>
<td>- .52 (.13)**</td>
<td>-.32 (.23)</td>
<td>.05 (.06)</td>
</tr>
<tr>
<td>CSE</td>
<td>-</td>
<td>.30 (.16)</td>
<td>0.44 (.04)**</td>
</tr>
<tr>
<td>MOT</td>
<td>-</td>
<td>-</td>
<td>.02 (.03)*</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.50 (.07)</td>
<td>.35 (.09)</td>
<td>.76 (.05)</td>
</tr>
</tbody>
</table>

Indirect Effects

|               |           |           |           |
| LGO $\rightarrow$ CP | 0.01(0.01) |           |           |
| PAO $\rightarrow$ CP | -0.01(0.01) |           |           |

*Note. LGO= Learning Goal Orientation; PAO= Performance Avoid Orientation;
CSE= Creative Self-efficacy; MOT= Intrinsic motivation; CP= Creative performance

* p < .05

** p < .001
Table 5B

*Summary of mediation model of motivational antecedents (week 2)*

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>CSE</th>
<th>MOT</th>
<th>CP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine</td>
<td>.01(.01)**</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Industry</td>
<td>-.01(.01)**</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Experience

<table>
<thead>
<tr>
<th>Variable</th>
<th>CSE</th>
<th>MOT</th>
<th>CP</th>
</tr>
</thead>
<tbody>
<tr>
<td>LGO</td>
<td>1.30(.15)**</td>
<td>.39(.37)**</td>
<td>.19(.08)*</td>
</tr>
<tr>
<td>PAO</td>
<td>-.36(.12)**</td>
<td>-.26(.22)</td>
<td>.06(.05)</td>
</tr>
<tr>
<td>CSE</td>
<td>-</td>
<td>.34(.21)*</td>
<td>0.43(.04)**</td>
</tr>
<tr>
<td>MOT</td>
<td>-</td>
<td>-</td>
<td>.07(.03)*</td>
</tr>
</tbody>
</table>

|= 0.03(0.01)  
| PAO → CP   | -0.01(0.01) |

Note. LGO= Learning Goal Orientation; PAO= Performance Avoid Orientation; CSE= Creative Self-efficacy; MOT= Intrinsic motivation; CP= Creative performance

* p < .05

** p < .001
3.8 Examining the Moderation Hypotheses

Hypotheses 11a-13b proposed that affective antecedents (e.g., HANA, HAPA, LANA, DVT, and CVT) would moderate the relationship between goal orientations (e.g., LGO, PAO) and CSE as well as the relationship between CSE and CP. In light of the previous results of poor model fit, I will use a series of SEMs to examine the theoretical model in two separate models. This will be done by examining the effects of the affective moderators (e.g., HAPA, HANA, LANA, LAPA) on the relationship between LGO and CSE, and, a separate model examining the effects of the affective moderators on the relationship between CSE and CP. The remainder of the hypotheses are reported in the form of standardized betas.

Hypothesis 11a predicted that HAPA moderates the relationship between LGO and CSE, and that this moderation was mediated by DVT over time. Following methodology by Edwards & Lambert (2007), I first examined the moderating effect of HAPA and DVT independently before examining the moderated mediation hypothesis directly. To accomplish this, I regressed CSE onto LGO ($\beta = .59, p < .05; \beta = .38, p < .05$), HAPA ($\beta = .43, p = .91; \beta = .21, p = .07$) and their interaction term LGO*HAPA ($\beta = .02, p = .83; \beta = .32, p = .06$). Similarly, I regressed CSE onto LGO ($\beta = .22, p = .69; \beta = .43, p < .01$), DVT ($\beta = -.27, p = .54; \beta = .41, p = .29$), and their interaction term ($\beta = .59, p = .44; \beta = -.51, p = .40$). Neither of the proposed moderators were supported. A moderated mediation requires the mediating moderator to be significant before mediated moderation can be established. Given these results, I discontinued the moderated mediation analyses. Hypothesis 11a was not supported.

Hypothesis 11b predicted that LANA moderates the negative relationship between LGO and CSE, and that this moderation is mediated by CVT. Using the same strategy as the previous, I regressed CSE onto LGO ($\beta = .58, p < .01; \beta = .62, p = .09$), CVT ($\beta = .31, p = .51; \beta = .22, p = .
.35) and their interaction term ($\beta = -1.12, p = .41; \beta = .05, p = .06$). Similarly, I regressed CSE on LGO ($\beta = 1.29, p < .01; \beta = .29, p < .01$), LANA ($\beta = .58, p = .38; \beta = .80, p = .56$), and their interaction term ($\beta = -1.31, p = .15; \beta = .52, p = .18$). Both of the proposed moderators had no effect, thus a mediated moderation was not necessary to test the hypothesis, hypothesis 11b was not supported.

Hypothesis 12A predicted that HAPA moderates the relationship between CSE and CP, and that this moderation is mediated by DVT. I regressed CP onto CSE ($\beta = .55, p < .01; \beta = .80, p < .01$), HAPA ($\beta = .11, p = .53; \beta = .55, p = .11$) and their interaction term ($\beta = -.02, p = .53; \beta = -.10, p = .43$). Similarly, I regressed CP onto CSE ($\beta = .77, p < .01; \beta = .52, p < .01$), DVT ($\beta = .33, p = .14; \beta = .03, p = .82$), and their interaction term ($\beta = -.07, p = .16; \beta = .01, p = .95$). Neither of these moderators were significant and thus hypothesis 12A was not supported.

Hypothesis 12b predicted that HANA moderates the positive relationship between CSE and CP, and that the moderation would be mediated by CVT. First, I regressed CP on CSE ($\beta = .44, p < .01; \beta = .19, p < .05$), HANA ($\beta = -.16, p = .40; \beta = -.92, p = .22$) and their interaction term ($\beta = .04, p = .33; \beta = .20, p = .15$). Similarly, I regressed CP on CSE ($\beta = .51, p < .01; \beta = .42, p < .05$), CVT ($\beta = -.12, p = .42; \beta = -.21, p = .25$) and their interaction term ($\beta = .01, p = .56; \beta = .02, p = .23$). Neither of the moderators were significant, thus hypothesis 12B was not supported.

Hypothesis 12c predicted the opposite, that LANA would moderate the negative relationship between CSE and CP, and that the moderation would be mediated by CVT. To test this hypothesis, I regressed CP on CSE ($\beta = .40, p < .01; \beta = .25, p < .01$), LANA ($\beta = -.38, p = .18; \beta = -1.00, p = .11$) and their interaction term ($\beta = .06, p = .36; \beta = .22, p = .08$). Similarly, I regressed CP on CSE ($\beta = .43, p < .01; \beta = .41, p < .01$), CVT ($\beta = -.10, p = .56; \beta = -.20, p =
.23), and their interaction term (β = .03, p = .47; β = .04, p = .23). None of the moderators were significant. No support was found for hypothesis 12c.

Hypothesis 13a and 13b tests the dual tuning hypothesis that posits that the interaction between HAPA & HANA moderates the positive relationship between LGO and CSE and the relationship between CSE and CP, respectively. Hypothesis 13a was examined by regressing CSE on LGO (β = 2.71, p < .05; β = -.20, p = .94), HANA (β = 2.92, p = .08; β = -1.10, p = .82), HAPA (β = 1.70, p = .08; β = -.68, p = .84) and their interaction terms, LGO*HANA (β = -1.16, p < .05; β = .36, p = .80), LGO*HAPA (β = -.50, p = .21; β = .40, p = .68), LGO*HANA*HAPA (β = -.28, p = .15; β = -.08, p = .89), HANA*HAPA(β = -.74, p = .27; β = -.01, p = .90). The dual tuning moderation effect of HAPA and HANA on the relationship between LGO and CSE was not significant. Hypothesis 13a was not supported.

Hypothesis 13b was examined by regressing CP on CSE (β = .31, p = .27; β = -.23, p = .68), HANA (β = -.76, p = .25; β = -2.39, p = .09 ), HAPA (β = -.87, p = .17; β = -.59, p = .56) and their interaction terms, CSE*HANA (β = .09, p = .49; β = .53, p = .09), LGO*HAPA (β = -.13, p = .27; β = .14, p = .50 ), LGO*HANA*HAPA (β = -.07, p = .30; β = -.12, p = .32), HANA*HAPA(β = .46, p = .16; β = -.12, p = .32). The dual tuning moderation effect of HAPA and HANA on the relationship between CSE and CP was not significant. Hypothesis 13a was not supported.
CHAPTER FOUR: DISCUSSION

The Componential Theory of Creativity (Amabile, 1996) contends that workplace creativity is a process by which each of its three antecedents (e.g., motivation, affect and domain relevant knowledge) are subject to change over time. Although theorized as being dynamic, past research has largely ignored this perspective (Amabile et al., 2005). Moreover, past research has traditionally approached the study of organizational creativity from either a motivational perspective or from an affective state perspective; thereby assuming that it is either a motivational or an affective driven concept. The primary goal of the current study was twofold: first, it tested a theoretical framework that integrated the motivational perspective of creativity with the affective states perspective. Specifically, I drew upon Amabile’s Componential Theory of Creativity (1996) and examined a model whereby workplace creativity was related to goal orientations through creative self-efficacy and intrinsic motivation. Moreover, drawing from research on affective states, I proposed that affective states would augment motivation through changes in thinking styles (e.g., divergent and convergent thinking). Overall, I found support for a mediation between goal orientations and creative performance via creative self-efficacy. However, I found no support for the mediating role of intrinsic motivation. Similarly, I found no support for the moderating role of the proposed affective states. Second, the study addressed a call for more research on the dynamic model of creativity (Amabile et al., 2005). I tested the dynamic nature of creativity by examining the role of time using experience sampling methodology and growth models to understand the form of change in the concepts under investigation. However, I found no support for a dynamic model of creativity.

The following section begins with a broad discussion of the proposed theoretical model by providing a brief summary of the results and discussing their implications. Building on the
implications, the following section explores theories of change, focusing on theoretical and methodological considerations towards building a more robust dynamic theory of creativity. Finally, it will conclude with a section on the study’s limitations, practical implications and future research suggestions.

4.1 Goal Orientations, Creative Self-efficacy and Creativity

Drawing from the Componential Theory of Creativity (Amabile, 1996), I posited that learning goal orientations (LGO) and performance avoid orientations (PAO) would be related to creativity through two mediators: creative self-efficacy and intrinsic motivation. Results indicated that the relationship between goal orientations and creativity was mediated by creative self-efficacy but not by intrinsic motivation. Specifically, results indicated that LGOs were positively related to creative self-efficacy, which in turn resulted in higher levels of creativity, whereas PAOs were negatively related to creative self-efficacy, which in turn resulted in lower levels of creativity. These findings contribute to the creativity literature in two important ways. First, the findings corroborate recent research that has found a positive relationship between LGOs and creativity (Gong et al, 2009; Hirst et al, 2009). Further, it provides evidence that PAOs are not only negatively related to performance (Colquitt & Simmering, 1998), but also to creativity. Second, the current study responds to calls for investigation of the mediating effects of creative self-efficacy (Shalley et al., 2004). Specifically, my results are in line with Goal Orientation Theory (Dweck, 1986) because they suggest that ability is malleable and that individuals can increase their creative levels by developing their confidence in their ability to be creative. Such a conception of ability allows individuals to believe that they can improve and grow, which is conducive to success when dealing with ambiguous tasks such as creativity. As a corollary, greater creative self-efficacy is developed when higher levels of LGO are endorsed,
resulting in higher levels of creativity. In contrast, individuals who endorse PAOs strive to avoid unfavorable assessments of themselves by their peers or managers (Simmons & Ren, 2009), and are thus motivated to avoid creative tasks because they imply a high chance of failure and receiving criticism. As a consequence, these individuals do not experience the learning process that is required to successfully complete a creative task, which leads to lower levels of creative self-efficacy and subsequently to lower levels of creativity.

4.2 Intrinsic motivation, Creative Self-efficacy, Creativity and Social Cognitive Theory

The proposed theoretical model additionally posited that intrinsic motivation is a mediator between creative self-efficacy and creativity. This claim was based on the fact that creativity research has largely been guided by intrinsic motivation theories (see also one of the three components in the Componential Theory of Creativity; Amabile, 1996). The argument for intrinsic motivations influence on creativity is that when employees are intrinsically motivated, employees expend effort based on interest, curiosity, and have a deeper desire to learn (Ryan & Deci, 2000). Further, it is thought to increase positive affect, cognitive flexibility, risk taking, and persistence (Shalley et al, 2004). However, empirical results linking intrinsic motivation to creativity have been equivocal. In a number of laboratory studies, researchers manipulated levels of intrinsic motivation and found that participants with higher levels of intrinsic motivation had their products rated as more creative by expert raters (Amabile, 1979; Koestner, Ryan, Bernieri, & Holt, 1984). However, in another series of laboratory studies, scholars have found weak or non-significant effects for intrinsic motivation on creativity (Eisenberger & Aselage 2009; Shalley & Perry-Smith, 2001). It should be noted that these laboratory studies often construe creativity in terms of novelty, judging participants on unique artwork and writing task performance. Whereas, creativity in the workplace is concerned with not only the novelty of an
idea, but also its usefulness and applicability in an organization—in light of this, the results from these laboratory studies cannot be generalized to the workplace creativity construct. Similarly, previous field studies involving creativity have produced conflicting results: a number of field studies found a positive relationship between intrinsic motivation and creativity at work (Eisenberg & Rhoades, 2001; Eisenberger & Aselage, 2009). These studies examined intrinsic interest, a proxy for intrinsic motivation, and its relation to supervisors rated creativity in a diverse organizational sample. Qualifying these results, Dewett (2007) found that, in a sample of R&D personnel, the relationship between intrinsic motivation and creativity for self-reported creativity was fully mediated by willingness to take risks. Moreover, the author found that intrinsic motivation and supervisor related creativity were not related. These findings demonstrate that the link between intrinsic motivation and creativity are not as simple as previously thought (Eisenberg & Rhoades, 2001). Moreover, using a similar sample of R&D Scientists, Perry-Smith (2006) found that intrinsic motivation was not related to creativity.

As a consequence of these mixed findings, organizational scholars have called for studies to investigate new mediators or conditions under which intrinsic motivation is more or less likely to fuel creativity (Amabile & Mueller, 2007). The current study finds that creative self-efficacy mediates the relationship between goal orientations and creativity, whereas intrinsic motivation was unrelated to creativity. In light of these results, and the unequivocal findings in the literature on intrinsic motivation and creativity, I argue that creative self-efficacy holds more promise as an explanatory mechanism of creativity because it is a closer point estimate to creativity than than general intrinsic motivation.

The concept of self-efficacy was borne from Social Cognitive Theory (Bandura, 1977). Social Cognitive Theory emphasizes dual control systems in the self-regulation of motivation,
which implies that a proactive discrepancy production system works in tandem with a reactive discrepancy reduction system (Bandura, 2001a). In other words, people are motivated by the foresight of goals and the hindsight of shortfalls (Latham, 2012). The premise of Social Cognitive Theory is that individuals mobilize their effort and resources based on their anticipatory estimates of what is necessary for goal attainment (Latham, 2012). Thus, more difficult goals result in more effort and motivation exerted to attain them. However, this supposition only holds if the individual possesses the self-efficacy, or the belief regarding their capability to perform at a given level (Bandura, 2001a). In other words, if an individual is challenged with completing a creative task, intrinsic motivation theories would argue that an individual with high intrinsic motivation would perform better because they will persist in the face of failure, exert more effort, and have a deeper desire to learn (Deci & Ryan, 2002). However, Social Cognitive Theory proposes that if an individual does not possess the belief, or self-efficacy to complete the goal, intrinsic motivation will not exist. For example, if an individual is requested to complete a creative task and they do not believe they can accomplish, their performance on the task will falter. From this discussion, it would seem that the two constructs appear very similar in their relationship with creativity. Why then, might creative self-efficacy be a stronger predictor than intrinsic motivation?

Past research provides clues about why intrinsic motivation does not guarantee that employees will ultimately produce ideas that are novel and useful. First, research has demonstrated a variable relationship between intrinsic motivation and creativity at work. These studies conclude that, across varying samples and tasks, the relationship between intrinsic motivation and creativity is inconsistent (Amabile et al., 1994; Eisenberger & Aselage, 2008). These inconsistencies may stem from the fact that intrinsic motivation is a very broad measure.
For instance, the current study employed the multidimensional work motivation scale (MWMS) which measures the extent to which participants find their work fun, exciting and interesting. While other studies may employ different scales, they capture similar dimensions of intrinsic motivation as proposed in the original conceptualization of the concept (Eisenberger & Aselage 2008; Shin & Zhou, 2003). This measurement becomes problematic when we attempt to examine the relationship between motivation and creativity at work. Within any profession, work is multidimensional and varies vastly between people, jobs and organizations. Whether an individual finds their work intrinsically motivating is not inclusive of whether they find all the tasks of their work intrinsically motivating. That being said, an individual can find their work intrinsically motivating but actually have no intrinsic motivation to pursue a creative task they are assigned. In this case, a null or negative relationship between intrinsic motivation and creativity would be found. However, this is not the case with creative self-efficacy. As described above, creative self-efficacy is a measurement of an individual’s confidence in their ability to perform creative tasks – which is dependent on an individual’s characteristic that is subject to change over time. For example, Motivated Action Theory (Deshon & Gillespie, 2005) describes how quickly individual’s change their goal orientations with respect to their ever evolving goals. A vast amount of evidence has demonstrated that learning orientations are positively related to self-efficacy while performance orientations are negatively related (Anderman & Midgley, 1997; Bandura, 1998; Elliott & Dweck, 1988). Moreover, the current study found similar relationships between goal orientations and creative self-efficacy. This evidence suggests that self-efficacy is dependent on individual characteristics that are subject to change over time.

Moreover, because creative self-efficacy is domain specific, it allows greater resolution and clarity when examining its relation with creativity at work. Thus, given the inconsistent
results with intrinsic motivation and creativity, I propose that creative self-efficacy and Social Cognitive theory be integrated into the Componential Theory of Creativity (Amabile, 1996). As it stands, compared to research on intrinsic motivation and creativity, there are relatively fewer scholars who have investigated the relationship between creative self-efficacy and creativity. However, of these studies, support has been found across cultures (Gong et al, 2009) and across a diverse sample of varying jobs and industries (Tierney & Farmer, 2002; 2004).

4.3 Affective States as Moderators of Motivation

Building on the aforementioned motivational model of creativity, I posited that affective states would serve as an important moderator on the relationship between goal orientations and creative self-efficacy, and on the relationship between creative self-efficacy and creativity. Drawing from research on affect and creativity, I posited that the arousal dimension of affective states would provide energy to engage in creative behaviors (Russel, 2003), while the valence component would act as a signal that tunes cognitions, with positive valence resulting in more divergent thinking and negative valence, convergent thinking (Schwarz, 1990). Further, I proposed that the effect of affective states would be exerted on the motivational model via divergent (DVT) and convergent (CVT) thinking styles. Specifically, positive affective states (high arousal positive affect or HAPA and low arousal positive affect or LAPA) would be related to DVT while negative affective states (high arousal negative affect or HANA and low arousal negative affect or LANA) would be related to CVT. I found partial support for these hypotheses. First, I found that HAPA, but not LAPA, was positive and significantly related to DVT. However, I found no support for the association between HANA and LANA on CVT. However, I found that the bivariate correlations between affective states and thinking styles were in the expected direction. That is, I found that both HAPA ($r = .18$) and LAPA ($r = .14$) were positively
correlated with DVT and negatively correlated with CVT \((r = -0.13\) and \(r = -0.10\), respectively). Furthermore, I found that LANA was positively correlated with CVT \((r = 0.17\) and negatively correlated with DVT \((r = -0.19)\). Although these correlations were not statistically significant, their effect size and direction lends partial support to the proposition that affective states influence thinking styles. Moreover, in support of the four quadrant affect model (Russel, 2003), the bivariate correlation between HAPA and intrinsic motivation \((r = 0.70, p < .01)\) was twofold that of LAPA and intrinsic motivation \((r = 0.33, p < .01)\). A similar pattern was observed with HANA and intrinsic motivation \((r = -0.19, p < .05)\) and LANA and intrinsic motivation \((r = -0.25, p < .01)\). Interestingly, a similar pattern was observed between affective states and creativity. High activation states were more strongly related to creativity than low activation states: HAPA demonstrated a stronger relationship \((r = 0.51, p < .05)\) than LAPA \((r = 0.25, p < .01)\) with creativity. Similarly, HANA was less negatively associated with creativity \((r = -0.19, p < .05)\) than LANA \((r = -0.30, p < .05)\).

These results indicate that activated affective states result in higher levels of intrinsic motivation and creativity as evidenced by HAPA being more strongly correlated than LAPA to motivation and creativity, as well as HANA being less negatively correlated to motivation and creativity than LANA. Although I found partial evidence for the arousal and valence hypotheses through bivariate correlations, these effects did not moderate the relationship between goal orientations and creative self-efficacy, nor did they moderate the relationship between creative self-efficacy and creativity. Taken together, although HAPA may result in divergent thinking and higher levels of intrinsic motivation, it does not augment the level of goal orientations or creative self-efficacy.
Stepping back, these results advance the affective and mood literature on the relationship between affect and creativity. First, recent research has investigated the role of arousal and valence states on creativity in a laboratory setting (Baas et al, 2008). Participants were provided with a creativity task and induced to experience different levels of arousal and valence. Baas and colleagues (2008) concluded that activating states, regardless of their valence, were associated with higher levels of creativity. Moreover, they found no effect of deactivated affective states on creativity. Although these laboratory results have contributed to our knowledge on how the activation and arousal dimensions of affect have differential relations with creativity, several scholars (e.g., Anderson et al, 2014; Zhou & Hoever, 2014) have called for more research in organizational settings to further understand the affect-creativity link within a workplace setting.

The current study builds upon the inquiries of past scholars, and tests whether activation and arousal dimensions have differential effects on creativity in the workplace. Specifically, whether affective and arousal dimensions moderate the relationship between goal orientations and creative self-efficacy and the relationship between creative self-efficacy and creativity. No support was found for the moderation hypothesis as proposed. An explanation for my results may be that in a normal day-to-day work environment, affect may vary, but not to the same extremes than when manipulated in a laboratory study. Although I was unable to demonstrate a moderating effect of affect, I did find evidence for differential effects of arousal and valence. First, I found that high activation states were more highly correlated to intrinsic motivation than low activation states. Second, I found that HAPA was more positively correlated to divergent thinking styles. Moreover, building on the finding that affective states did not moderate goal orientations or creative self-efficacy.
4.4 Testing a Dynamic Model of Creativity

Early theorizing by person-situation theorists argued that time was a crucial part of understanding individuals in relations to their environments. They postulated that human behavior is a function of the person, environment and temporal context, or the perceptions of the past, present and future (Lewin, 1943). To that end, the most widely cited theory of creativity, The Componential Theory of Creativity (Amabile, 1996), contends that workplace creativity is a process by which each of its three antecedents are subject to change over time. The theory proposes that creativity is an outcome of motivation, affect and domain relevant knowledge, which co-occur and shape each other reciprocally. However, outside of the definition provided by Amabile (1998), there has been a lack of theory development that allows for the explanation of dynamics of creativity. The current study addresses these concerns and used a longitudinal design to test a dynamic model of creativity. First, following the propositions set out by Amabile (1996), I measured the variables of my conceptual model over a period of 10 days. Then, I tested the dynamic nature of each variable using increasingly complex latent growth curve models to understand the form of change over time. Initially, I found that not even an intercept-only model could be established—the data were too erratic to be fitted to a mean level over the course of 10 days. A further look into the data qualified these results. First, it appears that over the course of each week, only small fluctuations from the anchored mean (i.e., mean level at the start of the week) occur over the remainder of the week. Next, the weekend seems to result in some discontinuity where mean levels of each variable are drastically different from the previous week. These new mean levels are once more anchored and fluctuations are again very minor around this mean. This observation may be explained by spillover theories (Sonnentag, 2003), which presume that occurrences in an individual’s environment during their off time can affect
their work time. For example, an individual may experience stress over the weekend caused by daily activities which in turn change their overall demeanor when beginning work on Monday. Because of this, I decided to examine the data weekly (5 days) as opposed to the proposed 10 days. Doing so revealed a significant intercept only model, suggesting that individuals begin at varying levels of each variable and remain stable over the remainder of the week. These findings were contradictory to the expected findings because recent research has demonstrated that each of these antecedents are dynamic and change over time.

In conclusion, although I did not find support for a dynamic model of creativity using LGCMs, I however did find support for the fact that individuals differ on their initial levels of the antecedents under study. These findings warrant further investigation into the dynamic phenomenon before a conclusion can be drawn. However, it should be transparent that currently, there is no robust or descriptive theory that describes a dynamic model of creativity other than Amabile’s (1996) proposition that creativity changes and evolves over time.

To ground this concept in an analogy, currently, the non-descript nature of the componential theory of creativity is equivalent to stating a very general theory in which one states that sequoia trees grow in height over time (e.g., expected growth rates are 3ft/year). However, without specifying the time duration (e.g., how long does it take to grow?), the form of change (e.g., is the growth linear?), and the conditions to which change is expected to occur (e.g., what are the optimal environmental conditions?), the development of the appropriate methodology to capture this phenomenon becomes extremely difficult. Thus, a researcher who has set out to capture the growth of sequoia trees and measures growth and change every day for a period of 6 months is likely to find non-significant change over time.
In order to establish a stronger dynamic theoretical model of creativity, I dedicate the next section to discussing the theoretical and methodological implications that need to be addressed when studying change over time—that is, the specification of the time duration, form of change and conditions of change.

4.5 Towards a Dynamic Model of Creativity

The current study proposed a model in which I hypothesized that goal orientations would be related to creativity through creative self-efficacy and intrinsic motivation on the premise that each of these individual variables are subject to change, and through deduction, change in one variable would lead to change in another variable. However, without further hypothesizing the “how”, “why”, and “where” of change in each focal variable, establishing relationships of change becomes difficult. The first consideration that researchers need to address is the time duration of change and the number of associated measurement occasions.

4.5.1 Time Duration and Measurement Occasions

Time duration refers to the length of time that the substantive variable will be studied (Chan, 2015). The appropriate duration of time is one that captures the change in the substantive variable in a way that answers the research question proposed by the researcher. When constructing a model that examines the relationship of change, it is of crucial importance to be able to specify the time duration of each variable in the model because not all variables change at the same rate. Researchers need to be able to identify a scale at which change occurs within each substantive variable before beginning to examine how change in one variable relates to change in another variable. For example, affect is described as an intense, short lived experience (Forgas, 1995), which would ostensibly occur or change over a short period of time (e.g., seconds or minutes). In comparison, research on goal orientations suggest that an individual may endorse
different goal orientations over a task that takes an hour to complete (Yeo, Loft, Xiao, & Kiewitz, 2009). In this simplified example, the two constructs operate on a different time metric: affect on seconds and goal orientations on hours. Understanding the time duration and scale of which change occurs is the first step to understanding how these constructs relate.

Once a time duration has been conceptualized to capture the change process in the substantive variables of interest, the number of measurement occasions need to be specified (Ployhart & Vandenberg, 2010). It is well documented that intra-individual changes cannot be adequately assessed with only two time points because a two-point measurement produces a linear trajectory (or even a fixed point estimate if being more stringent) that cannot detect the functional form of a true change trajectory (Chan, 1998a; Chan, 1998b). A number of previous investigations into a dynamic model of creativity have employed two-time point methodologies, with the authors arguing that results demonstrate that results support a dynamic theory of creativity (Bledow et al., 2011; Bledow et al., 2013). However, their methodologies do not provide a true test of whether change is occurring. As stated previously, when using two-time points to examine change, change cannot be demonstrated as one cannot conclude whether the linear trend continues increasing, decreasing or remains at a constant rate. This is problematic in a number of ways: first, there are no degrees of freedom remaining to estimate model fit. This restricts the researcher from comparing whether the current model is of appropriate fit and from comparing it to an alternative model.

Thus, careful consideration must be given to conceptualizing the form of change before making an informed decision about when to administer the measures (e.g., Vancouver et al, 2001). This is an extremely important consideration as it dictates the type of methodology that should be employed to capture the dynamic phenomenon (Chan, 2014). To underscore the
importance of time duration and measurement occasions, an ongoing contention in the self-efficacy literature stems from this issue. That is, Bandura (1997) demonstrates that self-efficacy and performance are positively related, such that, as an individual increases their self-efficacy, they will perform better. However, this study is criticized by Vancouver and colleagues (2002; 2004) because Bandura (1997) studied subjects in a between-subject paradigm (one-time point) and one measurement occasion, to which a conclusion of change could not be supported. As a rebuttal, Vancouver and colleagues (2002; 2004) demonstrated that when using a longitudinal paradigm with a longer time duration and multiple measurement occasions, self-efficacy was found to be negatively related to performance—a finding that has contradicted the self-efficacy literature. This example demonstrates the importance of identifying the “how” of change and its implications on the methodologies used. Bandura (1997) contends that the form of change between self-efficacy and performance is positive and linear, and thus used a cross-sectional methodology; while Vancouver and colleagues (2002; 2004) employed a longitudinal methodology to argue that it takes on an inverse-U relationship.

The second step to building a strong dynamic theory after having specified the time duration to which change occurs, is to specify how change occurs, or the form (e.g., intercept, slope, quadratic) change may take over time. Once these mechanisms are understood, researchers can then develop appropriate methodology to capture the change phenomena. One challenge that arises when developing methodology to capture change is the balancing act between measurement occasions and practical considerations regarding sampling. It would be a researchers dream to be able to sample organizational participant’s multiple times a day, and an employee’s nightmare to provide multiple responses—which may lead to a higher dropout rate. Incorporation of theories of change may better equip researchers to decide on the number of
measurement occasions. Returning to the previous example, if affect is hypothesized to change over a short period of time, a short time duration and repeated measurement occasions would be best to capture change. Whereas goal orientations occur over longer periods of time, a longer time duration would be required with less repeated measures. However, the exact time duration and number of measurement occasions will depend on the substantive variable itself, and the theory used to explain the form of change. At the moment, there is a relative absence of theory and studies that examine the dynamic process of creativity. Hence, it is next to impossible to hypothesize the form of change in the focal variables.

As dynamic theories in creativity are currently in a nascent stage, exploratory research may be the most powerful and efficient way of deriving stronger theory. At the moment, pure reliance on deductive reasoning when developing dynamic theories may be a disservice. Instead, researchers should investigate dynamic theories using an inductive approach, examining change through trial and error, fitting intercept only models and slowly creating more complex models by examining cubic trends. Once a body of exploratory results has been developed, deductive reasoning can be applied to extrapolate the “how”, “why” and “where” of change, resulting in stronger theories of change.

As the literature currently stands, researching dynamic phenomena in creativity is akin to looking at two photographs where the only difference in the photographs is where the subject appears. Without prior dynamic theory, we can only crudely estimate the path the subject took to move to their end state. To reconcile, the next section examines the results of the currently proposed model, then provides a discussion on how theories of change can provide advancements to the study of a dynamic model of creativity.
4.5.2 Dynamic Goal Orientations: Motivated Action Theory

The current study was unable to find any significant change over time for either goal orientation (e.g., LGO or PAO). Surprisingly, these results do not contradict the overall literature on goal orientations. Despite the large amount of research conducted on goal orientations, it remains unclear whether goal orientations are trait based and express themselves in a consistent pattern across a range of situations, or are a short-term, situation dependent, way of acting and feeling (Nesselroade, 1988). To understand the current findings, I draw upon the Motivated Action Theory and methodological issues in regards to the study of time. The Motivated Action Theory (DeShon & Gillespie, 2005) suggests that individuals pursue hierarchically organized goals over time, where higher level goals are more abstract and specify the purpose of actions (e.g., setting a goal to get a promotion by the end of the quarter), while lower level goals are more concrete and motivate behaviors to achieve the higher level goals (e.g., staying at work longer to complete unfinished work). Goal orientations represent ways of achieving higher level goals by influencing behavior. For instance, an individual who endorses a learning goal towards achieving a promotion at work will be more likely to seek and use feedback. The premise of this theory is that higher level goals can shift quickly over time resulting in a top-down activation of goal orientations, which results in frequent and rapid changes in goal orientations along with their respective patterns of cognition, affect and behavior. Research supporting this supposition has been found in student samples, where researchers have observed shifts in goal orientations from learning goal orientations to performance goal orientations after following students from elementary school to middle school (Anderman & Anderman, 1999). Similarly, Fryer and Elliot (2007) examined changes in goal orientations over the course of a college semester and found a similar pattern of change: a decrease in learning orientations and an increase in performance.
orientations. These studies demonstrate that goal orientations are indeed a dynamic phenomenon. However, in these studies, the duration of change in goal orientations occurred over a number of months. Alternatively, Yeo, Loft, Xiao, and Kiewitz (2009) demonstrated that goal orientations may change over a short period of working on a single task. This phenomenon was observed in a laboratory study, where participants completed short 2-minute tasks and received feedback after each trial. Thus, evidence from this study suggests that goal orientations may change within a matter of minutes when feedback is provided.

Taken together, research has demonstrated two seemingly contradictory results: first, researchers who have examined the construct in a student achievement context found that goal orientations shift over a period of months while goal orientation research in a laboratory context has found that individuals can shift between different orientations within a matter of minutes (Fryer & Elliot, 2007). A possible explanation for these different results could pertain to the moderating role of feedback. Button and Mathieu (1996) contend that feedback is a mechanism that individual’s use to re-evaluate their goals and either use it as a cue to continue, re-evaluate or drop their goal. Integrating this role of feedback with Motivated Action Theory (DeShon & Gillespie, 2005), feedback can then be seen as a mechanism to which individuals change their higher level goals, and thus, their goal orientations. Applying this to organizational research, the time duration for which change may occur in an organization may be dependent on feedback cycles—such that organizations with higher frequencies of feedback may result in faster changes in goal orientations while organizations with lower frequencies of feedback, slower.

The current study used a time duration of 10 days, with one measurement a day. Given that feedback may be a moderator of the time duration of change, it would be conceivable that over a short 10-day duration, individuals may not have received feedback or experienced a
change in their higher level goals. If we assume this supposition is true, that feedback is the main mechanism to which goal orientations change, it would be advisable for researchers to study goal orientations over a time period in which feedback may occur. A time duration of at least 3-months coincides with the standard practice of providing quarterly reviews to employees – and time after the feedback in which individuals can incorporate feedback. Moreover, in this example, scholars would be advised to use at least three measurement occasions: one measurement at the beginning of the study, another at the time of feedback, and the last measurement prior to another round of feedback. However, these recommendations are sample dependent, as organizations that offer more frequent feedback may result in faster changes in goal orientations and thus shorter time durations of change.

### 4.5.3 Creative Self-efficacy and Creative Performance

Although it was originally hypothesized that creative self-efficacy would fluctuate from moment to moment, the current study found that creative self-efficacy did not change over a period of one work week; a finding that is not contradictory to the wider literature on self-efficacy (Tierney & Farmer, 2011). Gist and Mitchell (1992) proposed that employees assess themselves, their task, and the social work context in which they are embedded as a means of determining how competent they are in a given performance domain. As a corollary, environmental cues influence how an individual judges their own efficacy. Studies that have found changes over time in self-efficacy have generally used time lags of 3, 6 and 9 weeks (McNatt & Judge, 2008) or three months (McNatt & Judge, 2004). In these particular studies, these time periods coincide with the organizations performance evaluations. More recently, Tierney and Farmer (2011) examined changes of creative self-efficacy over time. In their study, the authors chose to examine change in creative self-efficacy using two measurement occasions
with a time-lag of 6 months between different measurement occasions. Moreover, drawing from the literature on socialization, a recent meta-analysis (Bauer et al., 2007) reported that the average timing for studies involving self-efficacy change used time lags of 4 to 6 months. The implications of these studies, in corroboration with Gist and Mitchell’s (1992) thesis that self-efficacy is developed through responses to the individual’s environment, is that self-efficacy requires a longer time duration to change over time than the one used in the current study. Drawing from the above studies, I propose that in order to capture change in self-efficacy, a time duration of 4-6 months would be appropriate. This time duration allows individuals to develop in their environment, receive feedback and incorporate it into their own judgment of self-efficacy. Similarly, measurement occasions should coincide with the rate of feedback, with a minimum of three measurement occasions over a time duration of 4-6 months.

4.5.4 Affective States: Affective Events Theory

The current study found that affective states did not change over a period of one work week. These findings are contradictory to the conceptualization of affect as a transient state (Forgas, 1999). However, as discussed earlier, a number of reasons could have accounted for these results. First, the number of measurement occasions employed in the study was not sufficient to adequately capture the form of change of affect. As previously stated, it would be advisable to capture multiple measurement occasions over the period of one workday. Affective Events Theory contends that work events lead to affective reactions, which in turn influence both work attitudes and affect-driven behaviors such as performance (Weiss & Cropanzano, 1996). These work events account for the variance in affect over a work day, which include day to day challenges and interactions with colleagues. Thus, by sampling an individual’s affect only once near the end of the workday, shifts in affect were not accurately captured. Second, the lack of
change in affective states can be attributed to affective spillover, or the effect that explains why affect may reset before every workday (Illies et al., 2007). These authors posit that individuals reset their affective states after receiving a mental break from after work experiences. That is, the temporal disengagement from work and the period of sleep between work days essentially restarts the individuals affective state (Sonnentag & Bayer, 2005). However, this is not to say that individuals return to the same affective state during the beginning of the workday. In fact, studies show large day to day variance in affective states (Ilies & Judge, 2002). However, since the current study only sampled individuals at the end of the workday, it failed to capture the true form of change in affective experiences. Researchers looking to measure affective states should thus be measuring at least twice a day to capture the shifts in affect that occurs throughout an individual’s work day. The timing of the measurement occasions should occur at the beginning and at the end of the workday.

4.6 Theoretical Contributions

The current research contributes to the literature on creativity by taking the first step towards examining a dynamic and integrative perspective on employee creativity. Using a diverse organizational sample and experience sampling methodology, it tested the proposition that workplace creativity is a dynamic process. Despite finding no support for a dynamic and integrative framework as hypothesized, the findings from this study advance important theoretical and methodological contributions to the study of creativity in the workplace.

First, past researchers have placed a strong emphasis on the dynamic component of the Componenntial Theory of Creativity (Amabile, 1988) and have implicitly assumed that creativity develops over time. The current study explicitly examines the tenets of the Componenntial Theory of Creativity using a longitudinal design that extends over a period of 2-weeks. Although I was
unable to provide support for the proposed dynamic model of creativity, the study outlines a path forward for scholars who are studying the dynamic process of creativity. This includes conducting initial research and hypothesizing about how each variable in a dynamic process may change. Specifically, the time duration and number of measurement occasions should be carefully thought out in order to adequately capture the process of change. Only once the time duration and form of change are understood, can researchers begin to develop the appropriate methodology to capture the change and contribute to a dynamic model of creativity.

Second, several scholars have called for studying the mediating effect of creative self-efficacy (e.g., Shalley et al., 2004). This study addresses this request by examining creative self-efficacy as a mediator between learning orientations and creativity. Moreover, the study goes beyond recent research on creative self-efficacy correlates (Tierney & Farmer, 2002; 2004) by providing the first exploration into how creative self-efficacy mediates the relationship between goal orientations and creativity over time in a work setting. Although the current study was unable to demonstrate the dynamic mediating process of creative self-efficacy, a strength of the study design is that it was able to disaggregate stable and temporal relationships, providing a more detailed assessment of creative self-efficacy. The study design meets criteria set forth by Bandura and Locke (2003) who contend that in order to study self-efficacy, individuals should be allowed to develop in their natural environment. Contrary to the adverse performance effect of self-efficacy on performance (Vancouver et al., 2001; 2002), the study found that creative self-efficacy was positively related to creative performance. These results suggest that the dynamics between creative self-efficacy and performance in a natural field setting may deviate from those found in a controlled, laboratory setting. A work environment may entail more complex, challenging work than a controlled laboratory manipulation. Thus, the findings are
consistent with Bandura and Locke’s (2003) assertion that self-efficacy beliefs improve an individual’s performance.

Another mediating mechanism that was examined in this study was the role of intrinsic motivation on creativity. Although the extant literature largely focuses on the role of intrinsic motivation as a mediating mechanism of creativity (Amabile, 2005), evidence in support of the relationship is inconsistent (Eisenberger & Aselage, 2009). The current study did not find support for the mediating mechanism of intrinsic motivation on creativity when accounting for creative self-efficacy. In light of these results, and the consistent findings between creative self-efficacy and creativity across samples (Tierney & Farmer, 2002; 2004), the current study questions whether intrinsic motivation is the appropriate mechanism to which creativity occurs—suggesting that a more predictive mechanism may be within creative self-efficacy.

Third, the current study used an alternative factor structure to study affect at work. The four quadrant affect model (Russell, 1980) differs from the widely used PANAS (Watson & Tellegen, 1988) and offers greater specificity of analysis and prediction because it covers low activation states. Whereas the PANAS only examines high activation positive (e.g., enthusiastic, excited) and high activation negative states (e.g., distressed, jittery), the four quadrant model allows more resolution by encompassing the opposite affective states, low activation positive affect (e.g., calm, relaxed) and low activation negative affect (e.g., sad, gloomy). The study found differential effects with high activation states (e.g., being more strongly related to creative self-efficacy and motivation) than low activation states. These findings answer the calls of affective researchers who have asked others to investigate how these arousal states may differ across outcomes (Warr et al., 2013). Although the study did not find a moderating effect of affect on motivation as proposed, it did however demonstrate that affect was related to creativity
through creative self-efficacy. This finding, although not hypothesized, did support the initial goal of the study, to integrate affective and motivational models of creativity. It provides evidence for a mechanism to which affect engenders creativity within a work sample.

4.7 Limitations and Future Research

The present study is not without its limitations. First, because all data were collected from the same source, there is a potential concern of common method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). However, given that the primary concern of the current study was understanding the within-subject nature of creativity, common method variance bias with self-report measures may be less of a concern. However, one possible contention would be the measuring of the dependent variable (e.g., creativity) as a self-report variable. Janssen (2001) contends that self-ratings of creativity are useful because employee’s cognitive representation of their own behavior account for their own contextual factors in their own work activities. Employees themselves may be more aware of the intricacies of their own creativity than their colleagues or managers, and thus are better judges of whether their own creativity is fundamentally or incrementally novel in the context of their work. Further, employees may be better judges of their own creativity especially when supervisors are unable to observe their activities, or interact with the employee on a rare occasion. Moreover, other-rated reports of creativity are often unavailable, and other authors have supported the use of self-rated reports of creativity (Shalley, Gilson, & Blum, 2009). Given that the extant literature uses self-report creativity measures, a possible alternative that may provide additional insight into the construct would be to examine the construct using qualitative methods via a diary study approach. Having employee’s complete entries at the end of their workday would provide an additional data point that could be useful when examining whether dynamic changes in creativity occur over time.
Similarly, another possible method for assessing creativity from an other’s rating perspective is the Consensual Assessment Technique (CAT; Amabile, 1988). However, this technique is best used when ratings of creativity are required for products or tangible outcomes (Carson, 2006).

A second limitation of the current research pertains to its inability to control for the temporal sequence of the variables and, as a consequence, its inability to rule out alternative explanations of the direction of causality. For example, I argued that affective states act as tuning signals that influence an individual’s behavior (Forgas, 1995); it is thus not clear whether an individual chooses to pursue a certain goal orientation based on an affective state, or if a goal orientation influences an individual’s affective state. A similar argument can be made as to whether affect tunes individual’s to be more creative, or if creativity’s byproduct is that it makes people experience high or low affect. For example, Fisher and Noble (2004) found that when individuals performed better, the performance lead to displays of positive affect. Despite this limitation, the current study employed a longitudinal design and sampled individuals over a period of ten days. The present study is the first step to understanding how creativity changes over time in a work setting, which is required before more robust theories of creativity can be developed. As a corollary, it should be noted that the design employed in this study could be examined using time-lagged models, which could provide evidence of temporal sequence. However, due to limitations in the way data were collected, it would not be advisable to draw conclusions based on the findings. This leads to the third limitation of the study.

The third limitation of the current study pertains to the fact that data collection occurred after 4PM during the workday, which produced variation in response times. Returning to the previous section, the major drawback of the variable response time is the inability to determine the time lag between the measures. In order to establish whether a time-lag has occurred, the
length of time between two variables needs to be measured or controlled for (Mitchell & James, 2001). Moreover, the collection of one measurement per day is limiting. Affective Events Theory (Weiss & Cropanzano, 1996) proposes that affect and cognitions are influenced by proximal events to the individual. Thus, an individual’s affect and cognition are constantly in flux during the workday. Collecting data at the end of the day does not allow for conclusions to be drawn about change over a workday. To reconcile, two measurements per day would be a more robust approach when employing experience sampling methodology, as it would allow a researcher to draw conclusions about change over a workday. Despite these limitations, the methods used allowed for the collection of a large sample size, resulting in a higher power to detect effects. This was especially important to detect the interaction effects in the proposed model.

Perhaps the largest limitation of the study was the exploratory approach it took to examine change over time. However, as discussed in previous sections, the lack of dynamic theories in creativity limited the study to essentially take an educated guess as to the time duration and number of measurement occasions for each variable in the model. This was accomplished by fitting increasingly complex growth models to the data until best fit was observed. Even if a quadratic trend was observed, a replication study would need to be employed in order to draw a substantive conclusion. This highlights the importance of theorizing about change in each substantive variable before attempting to examine an integrative and dynamic model of creativity. A clear path forward for future researchers should begin with testing and questioning each antecedent of creativity by assessing its time duration (e.g., how long it takes the construct to change), the forms of change (e.g., how the change occurs) and measurement occasions (e.g., how many measurements are needed to capture the change). That being said, the use of an inductive approach such as exploratory research may be the most efficient method for
investigating a dynamic model of creativity. Through exploratory research, mechanisms behind change can be more clearly understood, resulting in the development of a more robust dynamic model of creativity.

4.8 Practical Implications

Recent studies conducted over the past decade have clearly demonstrated that creativity is an important activity for proper organizational function. A core message of this study is that organizations can develop an employee’s level of creativity through increasing their levels of creative self-efficacy. To be more specific, it was found that both learning orientations and high activation positive affect were positively related to creative self-efficacy, which in turn, is positively related to creativity. In light of these results, a number of practical implications can be drawn. First, I found that learning orientations were positively related to creative self-efficacy while performance avoid orientations were negatively related. These findings suggest that if an organization is looking for creative employees, recruitment and selection may be tuned to finding individuals who are high in learning goal orientations and low on performance avoid orientations. Moreover, Gist & Stevens (1998) recommends that developmental programs may actually increase employees’ levels of learning orientations.

Second, the study found that HAPA was positively while HANA was negatively related to creative self-efficacy. In light of Affective Events Theory (Weiss & Cropanzano, 1996), the implication of this findings would be for managers to acknowledge that every interaction has the ability to influence an employee’s affective state, and that employees who are experiencing HAPA are in their most creative state while employees in a HANA state are least creative. These findings have large implications for organizations as simple interventions have the ability to have a large effect on an employee’s affective state. For instance, Gonzalez and Richter (2015)
demonstrate that positive affect at work increases after successful completion of a task. Thus, simple to implement goal-setting strategies may be employed to create a series of challenging tasks that work to keep employees in a HAPA state. However, it may be unreasonable to expect that a manager consistently keeps all their employees in a HAPA state. In this case, if a manager suspects employees are not in a HAPA state, it may be beneficial pursue non creative work until HAPA states have recovered.

Finally, perhaps the biggest contribution from the current study is finding that creative self-efficacy is the mechanism behind the relationship between affective states and goal orientations on creative performance. Such knowledge can help managers capitalize on their employee’s creative potential. This is because research has demonstrated that supervisors are instrumental for employee efficacy development (Eden, 1992). Thus, providing leadership training for efficacy building may be warranted for managers. This training would include encouraging supervisors to clearly convey expectations and provide feedback that affirms the employee’s creative capability, as well as acknowledging employee’s creative efforts. Research has demonstrated that transformational leadership training is positively related to creative performance within organizations (Shin & Zhou, 2003). Alternatively, organizations may use task specific training to enhance levels of employee creative self-efficacy over time (Axtell & Parker, 2003). This would involve brainstorming sessions that allow individuals to express creativity and discuss their ideas with their peers. The goal of these sessions would be to provide time where employees may receive feedback on their work and to further develop their creative self-efficacy.
4.9 Conclusion

The aim of the current research was to investigate a dynamic and integrative model of creativity. Evidence was found for an integrated model whereby affective states exert their effects on creativity through creative self-efficacy. Although it was unable to demonstrate a dynamic model of creativity, the results from this study provide the groundwork to further develop and refine a dynamic model of creativity. Moving forward, researchers testing dynamic models should be concerned with the time duration, measurement occasion and time of change for each variable in their model. Only once these issues are addressed can a dynamic model be tested.

In conclusion, the present study demonstrates that creative self-efficacy is the key mechanism to employee creative performance. Moreover, it provides evidence that affective states are related to creativity at work through its relation to creative self-efficacy, such that high arousal positive affect is positively related and high activation negative affect is negatively related.
CHAPTER FIVE: EXPLORATORY ANALYSIS

5.1 Introduction

In the proposed model, using the Componential Theory of Creativity (Amabile, 1996), I argued that individual creativity stems from both motivational and affective components. I had proposed that the affective components would moderate the relationship of the motivational antecedents but only found support for the motivational model. Specifically, support was found for a model whereby goal orientations were positively related to creativity through creative self-efficacy. However, the proposed affective states (e.g., positive and negative affect) did not moderate any of the motivational antecedents as hypothesized.

Given these results, I turn to exploratory research methods that build upon the current findings to uncover a model that combines both the motivational and affective antecedents into a single model of creativity. In the following sections, I will summarize a number of key theories that argue for a motivational mediation model of creativity. Second, I will re-visit affective theories to re-conceptualize the use of affective states as antecedents as opposed to moderators in the role of creativity.

5.1.1 The Alternative Creativity Model

The Componential Theory of Creativity (Amabile, 1996) proposes that three components are responsible for individual creativity: 1) domain relevant skills, 2) creativity-relevant processes and 3) intrinsic motivation. It was argued that goal orientations and creative-self efficacy played a role in all three components. To summarize from previous arguments, goal orientations are especially important for the development of creative self-efficacy because they describe a person’s belief in their own ability to learn and change (Dweck, 1986). Goal orientations are an individual’s disposition toward developing or validating one’s ability in an
achievement setting (Dweck, 1986). In this regard, learning goal orientations (from hereon, learning orientation) and performance avoid orientations (from hereon, avoid orientation) are particularly relevant in relation to creativity because they both relate to how an individual approaches skill acquisition and their subsequent self-efficacy and motivation for the task.

Past research on learning orientations have found that individuals who focus on learning orientations are more intrinsically motivated to seek out creative activities and take more risks in terms of solving problems using uncertain and untried approaches (Janssen & Van Yperen, 1998). Moreover, when obstacles are encountered, learning-oriented individuals are believed to deal with these challenges by investing additional effort to develop and master new skills (Vandewall, Cron, & Slocum, 2001). These findings suggest that goal orientations are an antecedent to developing confidence in one’s ability to perform, in other words, self-efficacy. This supposition has been supported by past research as several scholars have indeed found a positive relationship between learning orientations and engagement in innovative behaviors (Janssen & Van Yperen, 2004) and creative self-efficacy (Hirst et al., 2009; Gong et al., 2009).

Given the evidence above, I contend that learning orientations allow individuals to focus on obtaining new knowledge and skill development, thereby increasing their level of creative self-efficacy. Therefore, I hypothesize the following:

*Hypothesis 1: Learning orientations will be positively related to creative self-efficacy.*

While a learning orientation may foster creativity by encouraging individuals to engage in a learning process, the opposite may be true for avoid orientations. Individuals with an avoid orientation strive to avoid unfavorable assessments of themselves by their peers or managers (Simmons & Ren, 2009). Such individuals are thought to have a maladaptive approach to situations that involve challenge or difficulty, such as tasks that require creativity or innovation.
Bell and Kozlowski (2008) found that individuals with a high avoid orientation have a greater propensity to withdraw from tasks (especially in the face of failure), are less interested in difficult tasks, and have the tendency to seek less challenging material. In corroboration, recent research has found a negative relationship between avoid orientations and creativity (Gong, Kim, Lee, & Zhu, 2013). Building on these suppositions, I hypothesize that avoid orientations will be detrimental to the development of creative self-efficacy.

*Hypothesis 2: Avoid orientations will be negatively related to creative self-efficacy.*

### 5.1.2 The Role of Affective States

In my primary study, I investigated the role of affective states as moderators of the goal orientation and self-efficacy relationship. However, this supposition was not supported. I now revisit theories in order to re-conceptualize the role of affect and creativity.

Previously, I argued that goal orientations and creative self-efficacy account for two of the three vital components of creativity. Specifically, that goal orientations encourage or discourage the development or learning of domain relevant skills, while creative self-efficacy engenders intrinsic task motivation. Further, I argued that the third component (i.e., creativity relevant processes, or affective states) exerts its effects by acting as a moderator on the two former components. This supposition was built upon Fredrickson’s (2001) Broaden-and-Build Theory. In her theory, she suggests that affective states work to *augment* motivation towards creativity by, 1) increasing the number of cognitive elements available for association, 2) uncoupling of attention, allowing for alternative perspectives on problems and 3) increasing cognitive flexibility allowing diverse cognitive elements to associate. Similar arguments are made by other affect-creativity relationship theories such as Schwarz’s (1990) cognitive tuning
model, whereby the author contends that affective states *augment* the signal to the individual as to approach or avoid a situation. Although both theories state that affective states augment motivation, the authors never explicitly state that affect *moderates* motivation—however, the term *augment* implies that affective states increase or decrease the strength of the relationship between an independent (e.g., motivation) and a dependent variable (e.g., creativity), a moderator by definition (Baron & Kenny, 1986).

An alternative perspective to the above theories is to interpret affective states as antecedents of creativity. Previous research using a time-lag design has indeed found that change in affect had preceded creative performance (Bledow et al, 2011). Similarly, Amabile et al (2005) found that affect preceded creative thought after a short incubation period. Given these findings, I posit that affective states are antecedents as opposed to moderators of motivation in the affect-creativity relationship.

Therefore, drawing from the Broaden-and-Buil Theory (Fredrickson, 2001), positive affect is used to signal approach and top-down processing, conducive to creative performance. Therefore I propose that:

*Hypothesis 3*: \( HAPA \) *will be positively related to creative self-efficacy*

*Hypothesis 4*: \( LAPA \) *will be positively related to creative self-efficacy*

Conversely, negative affect signals avoidance and bottom-up processing, detrimental to creative performance. Therefore, I propose that:

*Hypothesis 5*: \( HANA \) *will be negatively related to creative self-efficacy*

*Hypothesis 6*: \( LANA \) *will be negatively related to creative self-efficacy*
5.1.3 Creative Self-Efficacy and Creativity

In the previous sections, I discussed how both goal orientations and affective states lead to the approach or avoidance of creative tasks. Building towards an alternative creativity model, I propose that creative self-efficacy will mediate the relationship between creativity and both, goal orientations and affect. Past research has demonstrated a strong relationship between creative self-efficacy and creativity. Tierney and Farmer (2002; 2004) found that employees tend to be more creative when they have higher levels of creative self-efficacy. In a similar and more recent set of studies, the authors have replicated their findings and found further support of creative self-efficacy predicting creativity over time (Tierney & Farmer, 2011;2012). Moreover, scholars have recognized the importance of creative self-efficacy and have called for further investigation of creative self-efficacy (Tierney & Farmer, 2002). In response, a number of studies have found that creative self-efficacy mediates transformational leadership and creativity (Gong et al 2009) as well as feedback and creativity in middle school children (Beghetto, 2006). Given the recent research, I propose that:

Hypothesis 7: Creative self-efficacy will be positively related to Creative Performance.

Moreover, connecting the previous hypotheses that predict that goal orientations and affective states will predict creative self-efficacy, I propose that creative self-efficacy will mediate the relationship between goal orientations and affective states on creativity.

Hypothesis 8: CSE will positively mediate the relationship between LGO and CP

Hypothesis 9: CSE will negatively mediate the relationship between PAO and CP

Hypothesis 10: CSE will positively mediate the relationship between HAPA and CP

Hypothesis 11: CSE will positively mediate the relationship between LAPA and CP

Hypothesis 12: CSE will negatively mediate the relationship between HANA and CP
Hypothesis 13: CSE will negatively mediate the relationship between LANA and CP

5.2 Methods

Data from the previous study will be used for the current investigation. In order to investigate the alternative model, I will first conduct an SEM to assess the stability of the constructs. Following, I will conduct a multiple regression and a relative weights analysis as a supplement to understand the relationship between the antecedents. Relative weights analysis provides another perspective to a multiple regression as it partitions the $R^2$ into pseudo-orthogonal portions, allowing for the examination of the relative contribution of each predictor (Tonidandel & LeBreton, 2014). Following, using a product of coefficients approach (Preacher & Hayes, 2008), I will estimate the indirect effect of goal orientations (LGO & PAO) on CP through creative self-efficacy (CSE). Similarly, I will do this for each of the affective states—testing the mediation of CSE through HAPA, HANA, LANA and LAPA, independently, on CP.

5.3 Results

Using SEM, I tested the alternative model by examining the fit indices for both weeks ($\chi^2 (df) = 9.36 \ (4)$, RMSEA = .05, CFI = .98, TLI = .95, SRMR = .02; RMSEA = .08, CFI = .99, TLI = .98, SRMR = .01). Good fit was demonstrated. Next, I test each hypothesis as proposed.

Hypothesis 1 & 2 predicted that LGO would be positively and PAO would be negatively related to CSE ($\beta = .59, p < .05; \beta = 1.15, p < .05$), PAO ($\beta = -.28, p < .05; \beta = -.25, p < .05$), both the hypotheses were supported.

Hypothesis 3 predicted that HAPA would be positively related to CSE ($\beta = .35, p < .05; \beta = .23, p < .05$), support was found for hypothesis 3.

Hypothesis 4 predicted that LAPA would be positively related to CSE ($\beta = -0.21, p = .33 \beta = -.15, p = .33$), support was not found for hypothesis 4.
Hypothesis 5 predicted that HANA would be negatively related to CSE ($\beta = -0.37, p < .05$; $\beta = -0.82, p < .05$), support was found for hypothesis 5.

Hypothesis 6 predicted that LANA would be negatively related to CSE ($\beta = -0.05, p = .76$; $\beta = 0.39, p = .45$), support was not found for hypothesis 6.

Hypothesis 7 predicted that creative self-efficacy would be positively related to creative performance ($\beta = 0.95, p < .05$; $\beta = 0.58, p < .05$), support was found for hypothesis 7. A full summary of these results can be found below in Table 6A.

Hypothesis 8 proposed that CSE would mediate the relationship between LGO and CP ($\beta = 0.23, 95\% CI [0.14, 0.35]$; $\beta = 0.49, 95\% CI [0.29, 0.72]$), hypothesis 8 was supported.

Hypothesis 9 proposed that CSE would mediate the relationship between PAO and CP ($\beta = -0.13, 95\% CI [-0.23, -0.04]$; $\beta = -0.14, 95\% CI [-0.26, -0.01]$), support was found for hypothesis 9.

Hypothesis 10 proposed that CSE would mediate the relationship between HAPA and CP ($\beta = 0.17, 95\% CI [0.09, 0.26]$; $\beta = 0.09, 95\% CI [0.03, 0.21]$), support was found for hypothesis 10.

Since hypothesis 11 predicts that CSE would mediate LAPA on CP and the relationship between LAPA and CSE was not supported, hypothesis 11 found no support.

Hypothesis 12 proposed that CSE would mediate the relationship between HANA and CP ($\beta = -0.18, 95\% CI [-0.31, -0.07]$; $\beta = -0.39, 95\% CI [-0.80, -0.09]$, support was found for hypothesis 11.

Since hypothesis 13 predicts that CSE would mediate LANA on CP and the relationship between LANA and CSE was not supported, hypothesis 13 found no support.
Table 6A

Summary of mediation model of motivational antecedents (week 1)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>β</th>
<th>RW</th>
<th>CI-L</th>
<th>CI-U</th>
<th>RS-RW(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LGO</td>
<td>.59(0.10)**</td>
<td>0.24</td>
<td>0.16</td>
<td>0.34</td>
<td>39.32</td>
</tr>
<tr>
<td>PAO</td>
<td>-.28(0.13)*</td>
<td>0.06</td>
<td>0.02</td>
<td>0.12</td>
<td>9.91</td>
</tr>
<tr>
<td>HANA</td>
<td>-0.37(0.14)**</td>
<td>0.06</td>
<td>0.02</td>
<td>0.12</td>
<td>9.29</td>
</tr>
<tr>
<td>HAPA</td>
<td>.35(0.09)**</td>
<td>0.17</td>
<td>0.11</td>
<td>0.24</td>
<td>27.89</td>
</tr>
<tr>
<td>LAPA</td>
<td>-.21(0.10)</td>
<td>0.03</td>
<td>0.01</td>
<td>0.06</td>
<td>4.96</td>
</tr>
<tr>
<td>LANA</td>
<td>-.05(0.15)</td>
<td>0.05</td>
<td>0.02</td>
<td>0.12</td>
<td>8.63</td>
</tr>
</tbody>
</table>

Criterion Creative Self-Efficacy ($R^2 = .61$, $p < .01$)

| CSE       | .95(0.06)    |

Criterion Creative Performance ($R^2 = .73$, $p < .01$)

Note: LGO = Learning goal orientation; PAO = Performance Avoid Orientation; HANA = High Activation Negative Affect; HAPA = High Activation Positive Affect; LAPA = Low Activation Positive Affect; LANA = Low Activation Negative Affect; CSE = Creative Self-Efficacy; CP = Creative Performance

* $p < .05$

** $p < .001$
Table 6B

Summary of mediation model of motivational antecedents (week 2)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>β</th>
<th>RW</th>
<th>CI-L</th>
<th>CI-U</th>
<th>RS-RW(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LGO</td>
<td>1.15(.21)**</td>
<td>0.36</td>
<td>0.26</td>
<td>0.48</td>
<td>50.33</td>
</tr>
<tr>
<td>PAO</td>
<td>-.25(.15)*</td>
<td>0.06</td>
<td>0.01</td>
<td>0.14</td>
<td>8.46</td>
</tr>
<tr>
<td>HANA</td>
<td>-0.82(.36)*</td>
<td>0.07</td>
<td>0.02</td>
<td>0.14</td>
<td>9.63</td>
</tr>
<tr>
<td>HAPA</td>
<td>.23(.12)*</td>
<td>0.11</td>
<td>0.05</td>
<td>0.18</td>
<td>15.67</td>
</tr>
<tr>
<td>LAPA</td>
<td>-.15(.15)</td>
<td>0.05</td>
<td>0.02</td>
<td>0.11</td>
<td>8.06</td>
</tr>
<tr>
<td>LANA</td>
<td>.39(.51)</td>
<td>0.06</td>
<td>0.02</td>
<td>0.12</td>
<td>7.86</td>
</tr>
<tr>
<td>Criterion</td>
<td>Creative Self-Efficacy ($R^2 = .72, p &lt; .01$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSE</td>
<td>.58(.16)*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Criterion</td>
<td>Creative Performance ($R^2 = .83, p &lt; .01$)</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Note: LGO = Learning goal orientation; PAO = Performance Avoid Orientation; HANA = High Activation Negative Affect; HAPA = High Activation Positive Affect; LAPA = Low Activation Positive Affect; LANA = Low Activation Negative Affect; CSE = Creative Self-Efficacy; CP = Creative Performance

* $p < .05$

** $p < .001$
5.3 Discussion

Previously, using Amabile’s Componential Theory of Creativity (Amabile, 1996) and Fredrickson’s Broaden-and-Build Theory, I had proposed a model of creativity whereby affective states moderate the motivational antecedents of creativity. In my main study, I was unable to find support for this supposition. However, the results of the exploratory study reveal that affective states exert their effects in tandem with goal orientations on creative self-efficacy, resulting in higher levels of creativity. More specifically, I found that HAPA was positively related to creativity via creative self-efficacy, while HANA was negatively related to creativity via creative self-efficacy. Moreover, relative weights analysis revealed that LGO and HAPA were the strongest predictors of creative self-efficacy.

These results suggest that affective states are antecedents to creativity as opposed to moderators as previously proposed. These findings provide an alternative perspective to the Broaden-and-Build Theory (Fredrickson, 20000) as it supports the main tenets that affective states motivate individuals towards creativity. It further sheds light on the ambiguity around the mechanism of how affective states exerts its effect—these results demonstrate that affective states are indeed antecedents of creative self-efficacy and thus, creativity. Moreover, this supposition is in line with Social Cognitive Theory (Bandura, 1998) because it states that self-efficacy refers to an individual’s belief in their capability to mobilize the motivation, cognitive resource, and courses of action needed to meet given situational demands (Wood & Bandura, 1989). As a corollary, these high activation states may contribute (e.g., positively or negatively) to the underlying motivation within creative self-efficacy. In sum, exploratory results demonstrate that both goal orientations (e.g., LGO and PAO) and affective states (e.g., HAPA and HANA) influence an individual’s confidence in their ability to be creative, which in turn,
results in higher levels of creativity.

In conclusion, the present study demonstrates that creative self-efficacy is the key mechanism to employee creative performance. Moreover, it provides evidence that affective states are related to creativity at work through its relation to creative self-efficacy, such that high arousal positive affect is positively related and high activation negative affect is negatively related.
References


DOI: 10.5465/AMR.1992.4279530


Ilies, R., & Judge, T. A. (2002). Understanding the dynamic relationships among personality, mood, and job satisfaction: A field experience sampling study. *Organizational behavior...
and human decision processes, 89(2), 1119-1139. DOI: https://doi.org/10.1016/S0749-5978(02)00018-3


Appendix A: Measures

Attitudes Towards Divergent Thinking (Basadur & Finkbeiner, 1985)
How strongly do you agree with the following statements?
(1- strongly disagree to 5- strongly agree)
Preference for Ideation (Divergent thinking; a=.68)

1. I feel that all ideas should be given equal time and listened to with an open mind regardless of how zany they seem to be.
2. I like to listen to other people’s crazy ideas since even the wackiest often leads to the best solution.
3. I feel that people at work ought to be encourage to share all their ideas, because they never know when a crazy-sounding one might turn out to be the best.

Tendency for Premature Critical Evaluation of Ideas (a=.83)

1. Quality is a lot more important than quantity in generating ideas
2. Judgement is necessary during idea generation to ensure that only quality ideas are developed
3. We should cut off ideas when they get ridiculous and get on with it
4. You need to be able to recognize and eliminate wild ideas during idea generation

Creative Self-efficacy (Tierney & Farmer, 2002)
Using the following responses please indicate the extent to which you agree or disagree that each statement currently describes you.
(1-very strongly disagree to 7-very strongly agree)

1. I feel that I am good at generating novel ideas
2. I have confidence in my ability to solve problems creatively
3. I have a knack for further developing ideas of others

Goal Orientation (VandeWalle, 1997)
How strongly do you agree with the following statements?
(1= strongly agree to 6= strongly disagree)

Learning Goal Orientation

1. I often read materials related to my work to improve my ability
2. I am willing to select a challenging work assignment that I can learn a lot from
3. I often look for opportunities to develop new skills and knowledge
4. I enjoy challenging and difficult tasks at work where I’ll learn new skills.
5. For me, development of my work ability is important enough to take risks
6. I prefer to work in situations that require a high level of ability and talent
Performance Avoid Orientation

1. I would avoid taking on a new task if there was a chance that I would appear rather incompetent to others.
2. Avoiding a show of low ability is more important to me than learning a new skill
3. I’m concerned about taking on a task at work if my performance would reveal that I had low ability
4. I prefer to avoid situations at work where I might perform poorly

Multidimensional Work Motivation Scale (MWMS) (Gagne et al, 2015)
Why do you or would you put efforts into your current job?
(1= “not at all”, 2=”very little”, 3=”a little”, 4=”moderately”, 5=”strongly”, 6=”very strongly”, 7=”completely”) 

1. Because I have fun doing my job
2. Because what I do in my work is exciting
3. Because the work I do is interesting

Self-reported creative performance (Tierney et al., 1999)
How strongly do you agree with the following statements?
(1- Strongly disagree, 5- strongly agree)

1. Took risks in terms of producing new ideas
2. Solved problems that had caused other difficulties
3. Tried out new ideas and approaches to problems
4. Generated novel, but operable work-related ideas
5. Served as a good role model for creativity

Supervisor Rated Creativity (Tierney et al., 1999)
Please indicate how often the following statements characterize this employee 
(1-not at all to 5- to a large extent)

1. Demonstrated originality in his/her work
2. Took risks in terms of producing new ideas
3. Found new uses for existing methods or equipment
4. Solved problems that had caused other difficulty
5. Tried out new ideas and approaches to problems
6. Identified opportunities for new products/processes.
7. Generated novel, but operable work-related ideas.
8. Served as a good role model for creativity.
Multi-Affect Indicator scale
(Warr et al., 2014)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to the word.

Indicate to what extent you feel this way right now, that is, at the present moment.

1- Very slightly or not at all
2- A little
3- Moderately
4- Quite a bit
5- Extremely

HANA
Anxious ____
Nervous ____
Tense ____
Worried ____

LANA
Dejected _____
Depressed _____
Gloomy _____
Hopeless _____

HAPA
Enthusiastic _____
Excited _____
Inspired _____
Joyful ____

LAPA
Ease _____
Calm ______
Laid-back _____
Relaxed _____

*Acronyms will not appear on test materials*
Appendix B: LGCM Fits

Table 7A

_Growth Model Fit Indices: Week 1 and Week 2 data_

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Table 7B

Growth model fit indices: week 1 data

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I < .001
S = .84
Q = .54

I < .001

I < .001
S = .73

I < .001
S = .42
Q = .23