From Emotion to Creativity: A Three-Dimensional Model of the Impact of Multidimensional Emotion on Creative Thinking

Abstract

This study aims to explore the impact of multidimensional emotions on creative thinking by constructing a three-dimensional model that integrates relevant research findings. The research reveals that emotion plays a complex and pivotal role in the creative thinking process, with different emotional dimensions interwoven with various aspects of creativity. Based on this, the study proposes three directions for future research to provide a theoretical framework and empirical foundation for further exploration in this field, promoting the development of creativity research across interdisciplinary domains.

Keywords: Multidimensional emotion, Creative thinking, Situational factors, Three-dimensional model, Creativity stimulation strategies

1. Introduction

A. Research Background and Significance

In today's increasingly interdisciplinary academic environment, the relationship between emotion and creative thinking has become a prominent area of research. From psychology to management, and from neuroscience to sociology, numerous disciplines have gradually acknowledged the importance of emotion in the process of creativity generation and development. However, due to the involvement of multiple disciplines' theories and methods, the research conclusions often lack universality, and the results from different fields have not been effectively integrated. This study aims to build a unified theoretical framework to promote a comprehensive understanding of the relationship between emotion and creative thinking, providing more practical and meaningful theoretical support for related fields.

B. Research Objective and Innovation

The primary objective of this research is to construct a three-dimensional model to analyze the mechanisms through which multidimensional emotions influence creative thinking. The innovation lies in integrating emotional dimensions from various disciplinary perspectives, breaking the limitations of previous unidimensional studies. Through this multidimensional analysis, the study not only provides deeper insights into the complex relationship between emotion and creative thinking but also offers a more comprehensive theoretical framework for future research, advancing the field in both depth and breadth.

C. Research Methodology

This research employs a literature review method combined with empirical research. It systematically gathers and analyzes relevant research literature from psychology, management, neuroscience, sociology, and other disciplines. Key information regarding the relationship between emotion and creative thinking is extracted from these studies and categorized and integrated within a logical framework. Using this approach, the study constructs a three-dimensional model of the impact of multidimensional emotion on creative thinking and systematically reviews and evaluates existing research based on the model. Additionally, empirical experiments were designed to simulate real-world scenarios to analyze the influence of multidimensional

emotions (positive, negative, high arousal, low arousal) on creative thinking. The study also explores the moderating effects of task contexts (high–pressure, low–pressure, and free tasks) and cultural backgrounds (Eastern vs. Western cultures) on the emotion–creativity relationship.

2. Theoretical Basis of Multidimensional Emotions and Creative Thinking

A. Dimension of Emotion

1) *Positive vs. Negative Emotions*

In emotional research, the distinction between positive and negative emotions is a commonly used classification. Positive emotions, such as joy and excitement, are considered to broaden an individual's cognitive and behavioral patterns, thereby facilitating creative thinking. For instance, in creative workshops, creating a positive atmosphere and eliciting positive emotions from participants often leads to increased quantity and quality of creative output (Fredrickson, 2001; Ivcevic, 2022). Conversely, negative emotions like anxiety and frustration may, to some extent, limit the flexibility of thinking. However, in certain situations, they can act as catalysts for creativity. For example, after experiencing setbacks or distress, artists may create more profound and emotionally resonant works (George & Zhou, 2002; Weiss et al., 2023).

2) *High vs. Low Arousal Emotions*

Emotions can also be categorized based on their arousal levels into high arousal and low arousal emotions. High arousal emotions, such as anger and excitement, place individuals in a heightened state of alertness, enhancing their sensitivity and responsiveness to the surrounding environment. This can provide a broader source of inspiration for creative thinking (Khalil et al., 2023; Pekrun et al., 2023). For example, intense debates (high arousal emotional states) during team brainstorming sessions can stimulate members to consider new perspectives on a problem (He & Wong, 2022). Low arousal emotions, such as calmness and relaxation, help individuals engage in deep reflection and integrate information, which plays a crucial role in refining and improving creative ideas (Isen et al., 1987; Zeng et al., 2022).

3) *Social Emotions*

Social emotions refer to the emotional experiences that individuals encounter during social interactions, such as a sense of belonging, identity, and loneliness. These emotions are closely related to the social environment and have a profound impact on creative thinking. In a supportive and inclusive social environment, feelings of belonging and recognition can stimulate an individual's desire for creative expression, encouraging the sharing and exchange of creative ideas (Egana-delSol et al., 2023; Kapoor & Mange, 2023). Conversely, loneliness may prompt individuals to engage in introspective thinking, potentially leading to unique creative perspectives. However, excessive loneliness can hinder access to information, thereby suppressing the development of creative thinking (Kollias et al., 2023; Törmänen, 2023).

B. Elements of Creative Thinking

1) *Novelty of Creativity*

Novelty is one of the core characteristics of creative thinking, referring to the degree to which creative ideas differ from existing knowledge and concepts. Under the influence of multidimensional emotions, positive emotions may encourage individuals to break free from traditional thought patterns, leading to the generation of more novel creative ideas. For instance, in the field of innovative design, designers in a passionate (positive emotional) state are more likely to create unprecedented product shapes or functions (Lloyd-Cox & Pickering, 2022; Hagen et al., 2023). At the same time, the pursuit of uniqueness in social emotions (such as within groups that value individuality) can drive individuals to generate novel creative ideas to showcase their distinctiveness (Kudrowitz, 2023).

2) *Practicality of Creativity*

In addition to novelty, practicality is another important criterion for evaluating creative thinking. Creativity must offer solutions to real problems or meet specific needs to be truly valuable. In this regard, negative emotions such as worry and a sense of responsibility can encourage individuals to focus more on finding practical solutions to problems, thus enhancing the practicality of creative ideas (Rapti & Sapounidis, 2023; Pifarré, 2023). For example, when a company faces a crisis, employees' concerns about the company's future (negative emotions) may inspire them to propose more actionable innovative strategies. High arousal emotions, in some cases, can also heighten an individual's awareness of the urgency of a problem, prompting them to

quickly generate practical creative solutions (Namaziandost & Behbahani, 2023; Gormley, 2023).

3) *Fluency of Creativity*

The fluency of creativity refers to an individual's ability to generate a large number of creative ideas in a short period. Positive emotions help relax cognitive inhibition, enhancing cognitive flexibility and agility, thus facilitating the fluency of creative ideas (Huang & Chang, 2023; Lansing–Stoeffler & Daley, 2023). For example, a relaxed and enjoyable atmosphere (positive emotional environment) in a brainstorming session can stimulate participants to quickly propose a variety of creative ideas. Additionally, social emotions, such as positive interactions among team members, can provide more cognitive stimuli, increasing the fluency of creative thinking (Lee et al., 2023; Dias & Marinho–Araujo, 2023).

3. Research Review on the Multidimensional Emotions and Creative Thinking Based on a Three–Dimensional Model

A. Positive Emotions and Creative Thinking

1) *The Promoting Effect of Positive Emotions on Creativity Novelty*

It is widely acknowledged that positive emotions significantly enhance the novelty of creative thinking. According to Fredrickson's (2001) broaden–and–build theory, positive emotions expand an individual's attentional scope and cognitive associative networks, thereby fostering the development of innovative thinking. For instance, participants who watch humorous videos or recall joyful experiences in experimental settings significantly outperform the control group in generating novel ideas (Isen et al., 1987). However, the task type may moderate the effect of positive emotions. In structured tasks, the effect of positive emotions on novelty is limited because the rules constrain the possibility of divergent thinking (Baas et al., 2008). Additionally, cultural background also influences the expression and transformation pathways of positive emotions. In individualistic cultures, positive emotions are more likely to promote innovative behavior through self–expression, while in collectivist cultures, positive emotions are often used to stimulate teamwork (Leung et al., 2011).

2) *The Complex Impact of Positive Emotions on Creativity*

Practicality

Although positive emotions primarily enhance the novelty of creativity, under certain conditions, they can also enhance practicality. Research has shown that individuals experiencing positive emotions are more likely to explore various solutions, thereby discovering more feasible and practically valuable ideas (Amabile et al., 2005). For example, socially-driven entrepreneurs often propose innovative and viable solutions to social problems (Baron, 2008). However, excessive positive emotions may lead to irrational optimism, overlooking practical constraints (Baumann & Kuhl, 2002). In the business domain, positive emotions may cause individuals to overestimate the feasibility of an idea, leading to resource waste. Therefore, moderate positive emotions are crucial for balancing novelty and practicality.

3） *The Significant Promotion of Creativity Fluency by Positive Emotions*

Positive emotions significantly enhance creativity fluency, defined as the quantity of ideas generated within a given time. Studies have shown that positive emotions reduce cognitive inhibition and enhance information integration, making individuals more agile in performing tasks (Fredrickson & Branigan, 2005). For instance, in brainstorming experiments, a positive emotional atmosphere significantly increases the quantity and quality of ideas generated by participants (Madjar et al., 2002). Nevertheless, task complexity may diminish this effect. In highly difficult tasks, individuals require more cognitive resources for deep thinking, and the promoting effect of positive emotions on fluency may be suppressed (De Dreu et al., 2008).

B. Negative Emotions and Creative Thinking

1) *The Dual Effects of Negative Emotions on Creativity Novelty*

The influence of negative emotions is complex and context-dependent. Traditional views suggest that negative emotions inhibit creative thinking because they narrow the attentional scope (Isen, 1999). However, recent research has shown that certain types of negative emotions, such as sadness, may stimulate deep thinking, leading to unique creative ideas (George & Zhou, 2002). For example, the works created by artists after experiencing pain often carry profound emotional expression and artistic value. However, prolonged or excessive negative emotions generally have an inhibiting effect on novelty. Emotions like anxiety cause individuals to rely more on habitual

thinking patterns, reducing the uniqueness of their ideas (Byron & Khazanchi, 2012).

2） *The Significant Enhancement of Creativity Practicality by Negative Emotions*

Negative emotions are particularly effective in tasks that require solving practical problems. Studies have shown that individuals driven by emotions such as worry and anxiety pay more attention to details and practical operations, resulting in more realistic creative ideas (Carver & Scheier, 2001). For instance, employees often propose efficient solutions during market crises (Baumeister et al., 2001). However, the intensity and duration of negative emotions play a crucial role in determining their effects. High levels of anxiety may lead to cognitive resource depletion, weakening creative evaluation abilities (Schwarz & Clore, 2003).

3） *The Inhibitory Effect of Negative Emotions on Creativity Fluency*

Negative emotions generally reduce creativity fluency because they restrict cognitive flexibility and openness (De Dreu et al., 2010). For example, under time pressure, individuals' fluency in idea generation is significantly reduced. However, moderate negative emotions, such as urgency, may facilitate goal–oriented creativity generation in tasks of high complexity (Fredrickson, 2001).

C. High–Arousal and Low–Arousal Emotions

1） *The Motivational Role of High–Arousal Emotions*

High–arousal emotions (e.g., excitement, anxiety) typically enhance creativity fluency and novelty. Research has shown that in high–pressure situations, high–arousal emotions drive individuals to rapidly generate multiple solutions (Baas et al., 2008). However, excessively high arousal may lead to impulsive decisions or cognitive confusion, thereby weakening the quality of creativity.

2） *The Integrative Role of Low–Arousal Emotions*

Low–arousal emotions (e.g., calmness, relaxation) facilitate deep thinking tasks, particularly in situations requiring complex information integration (Isen et al., 1987). However, in fluency tasks, the contribution of low–arousal emotions is relatively weak.

D. Social Emotions and Creative Thinking

1） *The Stimulative Mechanism of Social Emotions*

Social emotions (e.g., sense of belonging, recognition) enhance creativity novelty by promoting team interaction and information sharing

(Amabile, 1983). For example, in interdisciplinary teams, trust and recognition significantly improve collaboration efficiency among members (Leung et al., 2011).

2) *The Limiting Conditions of Social Emotions*

Over-reliance on social feedback may suppress the generation of risk-taking creative ideas because individuals focus more on others' evaluations rather than their own thoughts (George & Zhou, 2002).

E. The Moderating Role of Situational Factors

1) *Task Context*

In high-pressure tasks, high-arousal emotions are more suitable for quickly generating creative ideas; in low-pressure tasks, low-arousal emotions are more conducive to deep thinking (Baas et al., 2008).

2) *Cultural Context*

Cultural backgrounds affect the relationship between emotional expression and creative performance. Collectivist cultures emphasize social emotions, while individualistic cultures focus more on the personal effects of positive emotions (Leung et al., 2011).

3) *Physical Context*

Physical environments (e.g., colors, lighting) indirectly modulate creative performance by influencing emotional states. For example, bright spaces enhance positive emotions, while soft lighting promotes low-arousal emotions (Isen et al., 1987).

4. Construction of a Three-Dimensional Model of the Impact of Multidimensional Emotions on Creative Thinking

A. Dimensions of the Model

1) Emotional Dimension

This dimension covers the following aspects:

Static Types: This includes positive emotions and negative emotions, as well as high-arousal emotions and low-arousal emotions. Positive emotions (such as excitement and pleasure) are typically associated with divergent thinking, whereas negative emotions (such as anxiety and sadness) may be more beneficial for concentrated problem-solving.

Dynamic Properties: Emotional fluctuations (rapid changes within a short period) and emotional persistence (long-term stable emotional

states) have different effects on creative thinking. For example, anxiety fluctuations under high pressure may trigger short-term inspiration, while prolonged negative emotions may suppress creative thinking.

Social Emotions: Refers to the emotional atmosphere at the team or group level (such as trust and cohesion) that promotes creative thinking within teams.

By considering these various types of emotions, a more comprehensive understanding of how emotional factors influence creative thinking can be achieved. For example, during creative team collaboration, it is important to not only focus on the emotional state of individual members (e.g., the activation of positive emotions) but also to consider the group's social emotional climate (such as the formation of team cohesion) and the dynamic changes in emotions within the task context (e.g., emotional arousal when facing pressure)..

2) Creative Thinking Dimension

Creative thinking primarily includes three key elements:

Novelty: Measures whether the idea is unique and groundbreaking. This is usually associated with divergent thinking and is significantly influenced by positive emotions or high-arousal emotions.

Practicality: Whether the idea can solve real-world problems or meet demands. Negative emotions (such as anxiety) may, under certain conditions, enhance the rigor of problem-solving, thus improving practicality.

Fluency: The quantity of idea generation or cognitive flexibility, which is closely related to emotions' regulation of attention and cognitive resources.

These three elements are interconnected and jointly form the overall performance of creative thinking. When analyzing the impact of emotions on creative thinking, it is necessary to examine how emotions affect these three elements separately and analyze the dynamic relationships between these elements under emotional influence. For instance, a particular emotion might simultaneously promote novelty and fluency, while having an inhibiting effect on practicality.

3) Contextual Dimension

Contextual factors play an important role in moderating the relationship between emotions and creative thinking. The contextual dimension includes the following factors:

Task Context: Different impacts of high-pressure tasks (high stress,

high–arousal emotions) versus routine tasks (low stress, low–arousal emotions) on creative thinking. In high–pressure tasks, emotional arousal may be a critical variable, while in routine tasks, emotional stability may be more important.

Socio–Cultural Context: Differences in emotional expression and creative value across different cultural backgrounds. For example, Western cultures may emphasize positive emotions and open expression, while Eastern cultures may focus more on emotional restraint and practicality.

Physical Environmental Context: The impact of the physical environment (e.g., workspace layout, color, lighting) on individual emotional states. Open spaces may be more suitable for team collaboration, but may also have a negative effect on some individuals due to a lack of privacy.

By integrating these contextual factors, a more precise understanding of the dynamic impact of emotions on creative thinking can be achieved. For instance, in a team brainstorming session, an open layout and a supportive atmosphere may trigger positive social emotions, thereby enhancing novelty and fluency.

B. Theoretical Assumptions and Logical Relationships of the Model

Based on this three–dimensional model, the following theoretical hypotheses are proposed:

Hypothesis 1: Different types of emotions have varying degrees of direct influence on the three elements of creative thinking (novelty, practicality, fluency).Positive emotions may be more beneficial for enhancing novelty and fluency, while negative emotions under certain conditions may enhance the practicality of ideas.High–arousal emotions may amplify the spontaneous generation of ideas, while low–arousal emotions may support sustained creative thinking tasks.

Hypothesis 2: Contextual factors play a significant moderating role between emotions and creative thinking.The effects of emotions on creative thinking may vary significantly under different task contexts (e.g., urgent vs. non–urgent tasks). For example, in competitive tasks, high–arousal emotions (e.g., excitement or nervousness) may enhance creative thinking, while in cooperative tasks, social emotions (e.g., trust) may be more important.Socio–cultural contexts will influence the expression of emotions and their impact on the creative thinking process. For instance, in collectivist cultures, team social emotional

climate may take precedence over individual positive emotional states.

Hypothesis 3: There are complex interactions between emotions, creative thinking, and contextual factors.Emotions not only influence creative thinking but are also influenced by the results of creative thinking. For instance, successful creative outcomes may trigger more positive emotions, while failures may lead to emotional fluctuations or shift towards negative emotions.Contexts (e.g., team supportiveness) may simultaneously influence emotional experiences and creative thinking performance, and this effect is dynamic and phase-dependent.

C. Logical Relationships of the Model

The core logical relationships of the model are as follows:

Direct Influence of the Emotional Dimension: Emotions directly affect the creative thinking dimension by influencing individuals' cognition, motivation, and behavioral tendencies. For example, positive emotions may promote the development of novelty and fluency by expanding attention or enhancing cognitive flexibility.

Moderating Role of the Contextual Dimension: The contextual dimension, as an external condition, moderates the pathway and intensity of emotional influence on creative thinking. For example, in a highly competitive context, high-arousal emotions may be amplified, while in a collaborative setting, social emotions may play a dominant role.

Dynamic Interaction via Feedback Mechanism: The results of creative thinking influence emotional states and the evaluation and selection of the context. For instance, successful creative outputs may enhance team cohesion and positive emotions, further reinforcing creative thinking.This dynamic interaction forms a complex system that jointly influences individuals' performance in creative activities and provides more systematic theoretical support for the study of multidimensional emotions in creative thinking.

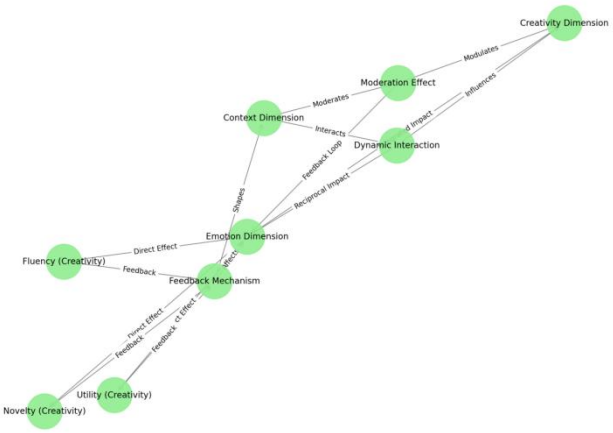

Fig.1. Three-Dimensional Model Diagram of the Impact of Multidimensional Emotions on Creative Thinking

5. Experimental Design

A. Experimental Purpose

The influence of emotions on creative thinking has a multidimensional nature, with task context and cultural background being factors that may significantly moderate this relationship. This experiment aims to simulate real-world scenarios to analyze the impact of multidimensional emotions (positive, negative, high arousal, low arousal) on creative thinking. Additionally, it explores how task contexts (high pressure, low pressure, and free tasks) and cultural backgrounds (Eastern and Western cultures) moderate the relationship between emotions and creative thinking.

B. Experimental Procedure

1) Experimental Preparation

a) Participants

A total of 100 participants were recruited, with an equal gender distribution and ages ranging from 18 to 35. They were divided into two cultural groups: 50 participants in the Western cultural group and 50 in the Eastern cultural group.

b) Grouping

Each cultural group was further divided into three subgroups based on task context: high pressure, low pressure, and free task. Within each task context, four types of emotions were induced: positive, negative, high arousal, and low arousal.

c) Experimental Environment

High Pressure Context: Time-limited tasks, noisy environment.

Low Pressure Context: No time constraints, quiet environment.

Free Task Context: Open space, free creativity.

d) Emotion Induction Methods

Positive Emotions: Watching a comedy clip, listening to cheerful music.

Negative Emotions: Reading a sad story, listening to somber music.

High Arousal Emotions: Playing fast-paced music, setting a countdown timer.

Low Arousal Emotions: Playing meditation music, dimming the lights.

2) Experimental Tasks

Each participant completed the following tasks:

a) Novelty Task: Design a completely new everyday household item.

b) Practicality Task: Optimize an existing mobile phone feature.

c) Fluency Task: Generate as many new product ideas as possible within 5 minutes.

3) Data Collection

a) Emotional State

The PANAS scale was used to record emotional scores (positive/negative, high/low arousal).

b) Creative Thinking Performance

Novelty: Expert ratings on the uniqueness of the idea (0–10 points).

Practicality: Market survey evaluation of the feasibility of the feature optimization (0–10 points).

Fluency: The number of ideas generated in the task.

c) : *Moderating Variables*

Task completion time.

The influence of cultural background on task orientation.

C. Experimental Results

1) Positive Emotions

Significantly increased novelty scores (average score: 8.2).

Had a major impact on fluency (more than 10 ideas generated on average).

Moderate effect on practicality (average score: 6.5).

2) Negative Emotions

Lower novelty scores (average score: 6.1).

Significant improvement in practicality (average score: 7.8).

Poor fluency performance (average of 5 ideas).

3) High Arousal Emotions

Especially effective in high-pressure tasks, particularly in fluency tasks (average of 13 ideas generated).

Moderate improvement in both novelty and practicality.

4) Low Arousal Emotions

More effective in free task contexts, especially in practicality (average score: 8.1).

Minimal impact on novelty.

D. Experimental Discussion

1) Result Analysis

a) Main Effects of Emotion on Creative Thinking

Positive emotions significantly enhance novelty and fluency, while negative emotions are more effective in solving practical problems and improving practicality.

b) High and Low Arousal Emotions

High arousal emotions are more suitable for urgent tasks, while low arousal emotions are better suited for detailed and complex tasks.

2) Moderating Effects

a) Task Context

High-pressure tasks show significant improvement in efficiency (fluency performance) with high arousal emotions. In free tasks, low arousal emotions are more helpful in refining ideas.

b) Cultural Background

The Western cultural group performed better in novelty and fluency tasks, while the Eastern cultural group performed better in practicality tasks.

3) Limitations and Suggestions for Improvement

a) Emotion Measurement

Subjective scales may introduce bias, and future research could incorporate physiological measurements, such as EEG.

b) Sample Size

The sample should be expanded to include a wider range of age groups and cultural backgrounds.

c) Task Design

More types of creative tasks should be added to verify the applicability of the findings across different domains.

E. Experimental Conclusion

This experiment confirmed the impact of multidimensional emotions

on creative thinking, with results supporting the significant interaction between emotion types and task contexts. The integration of emotion induction and task design provides new empirical evidence for creative thinking research, offering a theoretical foundation for improving productivity in the creative industries.

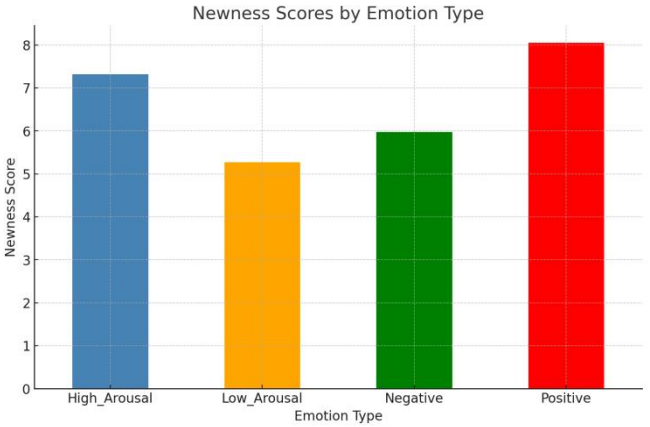

Fig.2. The Impact of Different Emotion Types on Novelty Scores

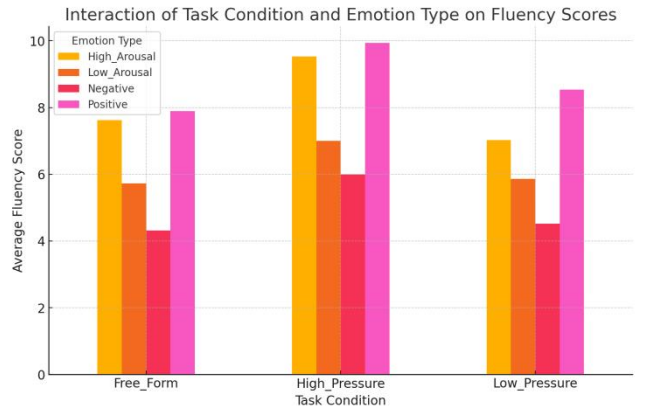

Fig.3. The Interaction Between Task Context and Emotion Type on Fluency Tasks

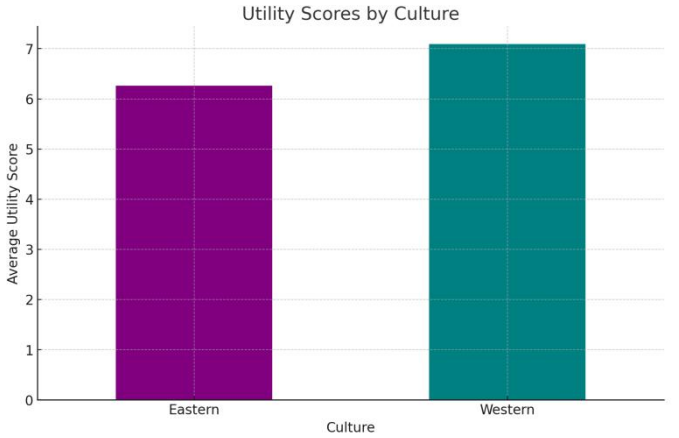

Fig.4. The Moderating Effect of Cultural Background on Utility Scores

6. Results and Analysis

A. Research Conclusions

This study constructs a three-dimensional model of the influence of multidimensional emotions on creative thinking. Through literature review and experimental validation, the following key conclusions were drawn:

1) Mechanisms of Multidimensional Emotions' Impact on Creative Thinking

a) Categorized emotional impacts

Positive emotions (e.g., joy, excitement) significantly enhance the novelty and fluency of creative thinking, leading to broader associative thinking and faster idea generation. Negative emotions (e.g., anxiety, sadness), under certain conditions, can enhance the practicality of creativity by triggering more detailed evaluations and problem-oriented thinking. Additionally, high-arousal emotions (e.g., excitement, anger) facilitate quick reactions and the spark of inspiration, while low-arousal emotions (e.g., calm, meditation) are more suitable for tasks requiring deep thinking.

b) Social emotional impacts

Social emotions (e.g., sense of belonging, trust) improve creativity through enhanced team collaboration and interaction, especially in multidisciplinary cooperative environments. However, isolation and over-reliance on social evaluation can undermine the independence of individual creativity.

2) Moderating Role of Contextual Factors

Contextual factors play a significant role in moderating the relationship between emotions and creative thinking:

a) Task context

In high-pressure tasks, high-arousal emotions can increase response speed and creativity efficiency, while in free tasks, low-arousal emotions foster deeper thinking.

b) Socio-cultural context

Collectivist cultures emphasize the synergistic effects of social emotions on team creativity, while individualistic cultures tend to leverage positive emotions to boost individual originality.

c) Physical environment context

Factors such as open spaces and bright lighting enhance positive

emotions, indirectly improving creative thinking performance.

3) Dynamic Interaction Mechanisms between Emotion and Creative Thinking

The relationship between emotion and creative thinking is not static, but a dynamic interaction system:

a) Feedback effects of emotions

Successful creative outputs can further intensify positive emotions, whereas failures may lead to the accumulation of negative emotions.

b) Bidirectional influence of context

Context not only moderates the impact of emotions on creative thinking but also adjusts according to the outcomes of creative thinking, such as innovative teams being more inclined to optimize supportive environments.

B. Theoretical and Practical Significance

This study constructs a three-dimensional model of the influence of multidimensional emotions on creative thinking. Through literature review and experimental validation, the following key conclusions were drawn:

1) Theoretical Significance

a) Deepening the understanding of the relationship between emotion and creative thinking

This study transcends the limitations of single-dimensional emotional research by revealing the diversified impacts of emotions on various elements of creative thinking (novelty, practicality, fluency) from a multidimensional perspective.

b) Moderating mechanism of contextual factors

For the first time, this study systematically integrates the roles of task, socio-cultural, and physical environmental factors, providing a theoretical foundation for understanding the relationship between emotion and creative thinking in complex dynamic systems.

c) Cross-disciplinary perspective

By combining research methods and findings from psychology, management, and neuroscience, a more inclusive and applicable research model is constructed.

2) Practical Significance

a) Creative industries

By optimizing emotional management strategies, such as stimulating high-arousal emotions in high-pressure tasks and creating a low-

arousal emotional atmosphere in long-term creative development, the quality and quantity of creative output can be enhanced.

b) Team management

In interdisciplinary teams, fostering social emotions (e.g., trust and belonging) can enhance collaboration efficiency, while avoiding excessive homogeneity to maintain the independence of creativity.

c) Environmental design

Optimizing physical environments based on task types, such as designing open spaces to facilitate team creative discussions or providing quiet, independent thinking spaces to enhance individual deep thinking abilities.

C. Research Limitations and Future Directions

1) Research Limitations

a) Subjectivity in emotion measurement

The questionnaire method used in this study may not fully capture dynamic emotional changes. Future research should incorporate physiological indicators (e.g., heart rate, skin conductivity) and brain imaging technologies (e.g., fMRI) to improve measurement objectivity.

b) Complexity limitations of the model

Although the three-dimensional model covers emotions, creative thinking, and contextual factors, the modeling of their complex interactions is not sufficiently deep, particularly the interrelationships between different types of emotions, which require further exploration.

c) Cultural sample limitations

The cultural background involved in the experiments is relatively limited, and broader socio-cultural contexts were not considered, which may restrict the generalizability of the research conclusions.

2) Future Research Directions

a) Neuroscientific study of micro-mechanisms

Future research can utilize brain imaging techniques to explore the neural mechanisms underlying the relationship between emotion and creative thinking. For instance, how the brain's active regions under different emotional states affect the various stages of creative generation.

b) Refined study of contextual factors

Future studies should delve into the complex interactions between physical environments and social contexts, such as the potential influence of lighting and colors on team creativity, and how these

factors combine with cultural backgrounds to influence creativity.

c) Cross-cultural and cross-group comparative studies

By comparing emotional and creative thinking patterns across different cultural backgrounds, age groups, and professional groups, we can uncover the key role of cultural and social variables in emotional management and provide empirical support for managing diverse teams.

d) Experimental design for dynamic emotional interventions

Experiments could be designed to monitor and adjust emotional states in real-time, such as through VR simulations of different contexts, where emotional cues are altered dynamically to observe changes in creative thinking performance.

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