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A Study on the Influence of Implicit Theories of Intelligence on Creative Behavior among Calligraphy Majors in Chinese Universities

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Abstract: As a key indicator for evaluating innovative talent, creative behavior occupies a central position in art education. For calligraphy majors, creative behavior not only reflects students' cognitive ability and artistic literacy, but also determines their capacity to develop personal styles and creative expression based on traditional techniques. This study focuses on the influence mechanism of "implicit theories of intelligence" on the creative behavior of calligraphy majors, aiming to fill the research gap in this field and explore its practical significance and educational strategies. Based on Dweck's theory of implicit intelligence, and supported by relevant literature, this research analyzes the positive effects of such beliefs on creative behavior from three perspectives: stimulating a sense of challenge, enhancing confidence and perseverance, and activating intrinsic motivation. The study reveals that students with a high level of incremental belief in intelligence are more likely to demonstrate stronger adaptability and creativity when facing creative challenges, thereby promoting the sustainable development of their creative behavior. Accordingly, this paper suggests that calligraphy education should systematically introduce "growth mindset" training, create a teaching environment that encourages exploration and tolerates failure, and incorporate the cultivation of intelligence beliefs into the educational system, in order to comprehensively improve students' creative ability and artistic expression. This research holds significant theoretical and practical value for optimizing art education models and promoting students' holistic development.

Keywords: Implicit Theories of Intelligence; Creative Behavior; Calligraphy Majors; College Students; Art Education

1. Research necessity

The Creative behavior refers to an individual's actions that apply knowledge and skills to produce novel and valuable outcomes or ideas (Pan, 2014). It can lead to meaningful results and is regarded as an important indicator for evaluating innovative talent (Cai, 2018). In the context of Chinese higher education, cultivating students' creativity—particularly in the arts—is considered a core objective (Luo, 2018). As a reflection of an individual's cognitive, emotional, and personality traits, creative behavior has become an indispensable core competency in art education (Guilford, 1950; Amabile, 1983). In the teaching of calligraphy, whether students can develop a personal style and creative expression on the basis of traditional techniques directly affects the formation of their artistic innovation ability (Luo, 2018). In this process, the concept of implicit theories of intelligence—specifically, the belief that abilities can be developed—has gradually become an important factor influencing students' creative expression (Dweck, 1986).Regarding the relationship between implicit theories of intelligence and creative behavior, previous research has shown a significant positive correlation between the two (Zhao et al., 2020). These beliefs can promote students' overall development by stimulating intellectual engagement, creativity, and integrative thinking (Sternberg, 2009). A study involving 302 adolescents found that individuals with low incremental beliefs in intelligence lacked coping ability under stress, thereby suppressing creative behavior (Schleider & Weisz, 2016). Another study with a sample of 620 college students indicated that implicit theories of intelligence significantly enhance creative self-efficacy, thus promoting creative behavior (Hass et al., 2016). Karwowski (2014) pointed out that individuals with high incremental beliefs in intelligence demonstrate greater confidence in creative tasks, while research by O'Connor et al. (2013) also found that such individuals exhibit stronger creative interests and problem-solving abilities. Therefore, enhancing the implicit theories of intelligence among calligraphy majors not only strengthens their creative behavior but also facilitates their academic achievement, resilience, self-efficacy, interest, and problem-solving capabilities.

However, current research on the relationship between creative behavior and implicit theories of intelligence among calligraphy majors remains scarce. Students with high levels of creative behavior tend to excel in problem-solving, autonomous learning, peer interaction,

classroom engagement, and social inclusivity, and are expected to play crucial roles in future social transformations. Within the context of calligraphy education, which emphasizes the integration of culture and technique, a systematic exploration of creative behavior and implicit theories of intelligence—and their impact on calligraphy majors—not only enriches the theoretical framework of cultivating creativity in art education, but also provides practical instructional strategies for calligraphy teaching. This, in turn, supports the cultivation of calligraphy talents who possess both traditional foundations and innovative capabilities. Therefore, this research holds significant practical importance.

2. Theoretical Background

2.1 Implicit Theories of Intelligence

Implicit theories of intelligence refer to an individual's cognitive tendency to believe that their intelligence can be developed through effort, strategies, and continuous learning (Dweck, 1986). Based on the strength of this belief, it can be categorized into incremental theories of intelligence and entity theories of intelligence. The former holds that intelligence can grow through effort, while the latter assumes intelligence is innate and fixed (Dweck & Leggett, 1988). Research has shown that individuals who hold incremental beliefs are more willing to face challenges and learn from failure, thereby achieving continuous growth (Dweck, 2006). In contrast, those with entity beliefs tend to avoid challenges and attribute failure to a lack of ability.Studies involving secondary school students have demonstrated that incremental beliefs significantly affect learning motivation and engagement (Zhong et al., 2010). A longitudinal study in New York public schools also found that students who received instruction on incremental beliefs outperformed the control group in both mathematics achievement and learning enthusiasm (Blackwell et al., 2007).

Incremental beliefs can also enhance self-confidence, motivate individuals to adopt new approaches, and lead to more valuable creative outcomes (Karwowski, 2014). In contrast, individuals with entity beliefs often lack confidence in creative tasks, believe that creativity cannot be improved, and thus exhibit limited creative behavior (Amabile, 2011). Moreover, incremental beliefs contribute to the development of positive interpersonal relationships (Zhang et al., 2020), whereas entity theorists tend to be more sensitive and easily frustrated in social interactions (Li & Yang, 2015). Therefore, calligraphy majors with strong incremental beliefs are more likely to face artistic challenges with persistence and effort, achieving continuous personal and artistic growth.

2.2 Creative Behavior

Creative behavior refers to the process in which individuals break away from traditional thinking patterns and engage in exploratory practices through flexible and diverse cognitive approaches, ultimately leading to unconventional outcomes or effective problem-solving (Guilford, 1950; Amabile, 1983). It typically embodies the dual characteristics of novelty and appropriateness, and is often guided by clear goal orientation within a social context (Feist, 1998).Creative behavior is an important indicator of students' cognitive abilities, learning capacity, and social adaptability (Beghetto & Kaufman, 2007). Individuals with high levels of creative behavior generally exhibit stronger self-confidence and self-efficacy, allowing them to face problems proactively and adopt effective problem-solving strategies more frequently (Tierney & Farmer, 2002). Furthermore, creative behavior contributes to the development of college students' self-concept, enhances their sense of identity, and positively influences emotional expression and thinking processes (Hennessey & Amabile, 2010; Karwowski, 2016). It is the result of interactions among various factors, including individual cognitive ability, social environment, and cultural background, and plays a critical role in academic achievement (Shi, 1995).

Students with high creative behavior tend to demonstrate strong curiosity, imagination, and a desire for challenge. In contrast, those with low creative behavior often lack novelty and exploratory drive, and show limited receptiveness to new experiences (Rimm & Davis, 1976). Creative behavior can stimulate students' interest in learning and enhance their intrinsic motivation (Deci & Ryan, 2000), which in turn leads to higher academic performance, particularly in the arts (Vestena et al., 2020). Such individuals are also more adept at analyzing complex problems from multiple perspectives and proposing creative solutions (Amabile, 1983). They exhibit greater adaptability and stronger innovation and competitiveness in the job market (Sternberg, 2006). Therefore, enhancing creative behavior among university students is an effective strategy for cultivating innovative talents in China (Lu, 2000).

3. The Mechanism by Which Belief in the Malleability of Intelligence Influences Creative Behavior

3.1 Stimulating Challenge Awareness and Growth Orientation

The belief in the malleability of intelligence is a key factor influencing individuals' achievement motivation and goal orientation. Individuals who hold an incremental theory of intelligence are more inclined to set mastery goals—that is, to pursue the enhancement of their own abilities and the acquisition of knowledge. In contrast, those who hold an entity theory of intelligence tend to focus on performance goals, placing greater importance on how they are perceived and evaluated by others (Sternberg, 2006).Individuals with a strong belief in the malleability of intelligence are more likely to set mastery-oriented goals, actively seek challenges, and maintain a high level of resilience when confronted with failure (Blackwell et al., 2007). Conversely, individuals who hold an entity belief about intelligence are more prone to setting performance-oriented goals, focusing on their image in the eyes of others, which in turn suppresses their creative expression and willingness to experiment (Robins & Pals, 2002).Those with incremental beliefs are more open to challenges, a disposition that facilitates the emergence of creative thinking and, consequently, promotes the development of creative behavior (Dweck, 2006). By contrast, students who adhere to entity beliefs are more sensitive to external evaluations and more likely to avoid challenges, thereby inhibiting their creative behaviors (Robins & Pals, 2002).

3.2 Enhancing Confidence and Perseverance

In academic settings, belief in the malleability of intelligence contributes to increased learning motivation and academic performance, thereby strengthening the drive for creative behavior. A study involving 620 university students found that individuals with a strong belief in intelligence malleability exhibited greater confidence and perseverance when facing creative tasks, ultimately demonstrating higher levels of creative behavior (Hass et al., 2016). These students were more likely to attribute failure to effort or strategy rather than to a lack of ability, thus forming a positive feedback loop of "failure–reflection–optimization" (Weiner, 1979). This mechanism is especially critical for calligraphy students, whose creative development requires long-term training and the gradual formation of a personal artistic style.

3.3 Stimulating Intrinsic Motivation and Innovative Performance

A study involving 378 students demonstrated that higher levels of growth mindset are associated with more active creative behavior, which in turn enhances intrinsic motivation and promotes the development of creative behavior (Karwowski, 2014). This motivation encourages students to continuously experiment with new forms of expression, pursue unique compositions, and develop personal styles, reflecting stronger artistic exploratory abilities. In the context of art education, intrinsic motivation not only serves as the foundation for sustained learning but is also directly linked to the innovation and originality of artworks (Amabile et al., 1994). Therefore, growth mindset not only facilitates learning behaviors but also constitutes a deep driving factor behind creative behavior.

Based on previous research, it can be inferred that among the target population of this study—calligraphy major undergraduates—students who hold a growth mindset are more likely than those with a fixed mindset to exhibit positive effects in both creative behavior and academic performance.

4. Research Conclusions and Discussion

4.1 Conclusions

In summary, growth mindset, as a cognitive framework with a positive psychological
orientation, plays a significant role in promoting the creative behavior of calligraphy major
university students. It not only influences students' attitudes toward challenges but also

determines whether they can learn from failure and maintain sustained engagement in artistic creation. The emergence of creative behavior depends on an individual's belief system about their abilities, and growth mindset provides the essential psychological foundation for

this.

4.2 Recommendations

Based on the above research conclusions, the following recommendations are proposed for calligraphy education practice:First, universities should develop courses such as “growth mindset training” to enhance students’ growth mindset. These courses can strengthen students’ recognition of intellectual malleability through classic case analyses, failure reconstruction exercises, and role model learning activities. Second, it is necessary to create a teaching environment that balances tolerance for mistakes with encouragement of exploration, motivating students to break free from traditional constraints and boldly experiment with diverse styles and creative expression.Finally, the cultivation of growth mindset should be comprehensively integrated into the curriculum system. Through dynamic feedback mechanisms and personalized evaluations, students’ creative potential can be continuously stimulated.

By systematically optimizing course design and teaching practice, the cultivation of growth mindset can be embedded throughout the entire calligraphy education process, thereby enhancing students’ overall artistic literacy and innovative capabilities.

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