

Explaining the Creativity Model of Students Based on the Perception of Competence with the Role of Perfectionism

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ABSTRACT

Objective: Students endowed with creative and critical thinking, alongside their unique intellectual and behavioral styles, confront academic and social life challenges. They efficiently fulfill their duties by optimally utilizing their existential forces and spirituality. The purpose of this study was to investigate the development of a model of student creativity based on perceived competence with the mediation of perfectionism.

Methods and Materials: The design of this study was descriptive-correlational. For this purpose, 300 students were selected using cluster random sampling and responded to the Abedi Creativity Scale (1993), the Harter's Self-Perception Profile for Adolescents (1982), and the Frost, Marten, Lahart, and Rosenblate Perfectionism Scale (1995). Data analysis was performed using path analysis. Additionally, SPSS 24 and AMOS 24 software were utilized for classification, processing, data analysis, and hypothesis testing.

Findings: The evaluation of the hypothesized model using fit indices showed that the model fits the measurement model (CFI=0.93, NFI=0.91, RMSEA=0.07). Overall, in the proposed model of the study, the results indicated that perceived competence is related to creativity both directly and indirectly through perfectionism ($p < 0.05$). Moreover, the results showed a positive and significant relationship between perceived competence and perfectionism.

Conclusion: Therefore, to enhance student creativity, intervening in perceived competence and perfectionism could be significant.

Keywords: Creativity, Perceived Competence, Perfectionism, Student.

1. Introduction

Given the rapid and growing environmental changes, especially in academic settings, leveraging the benefits and positive effects of positive psychology

constructs in the development and cultivation of students' cognitive and behavioral talents and skills is inevitable. Students with creative and critical thinking, characterized by a unique style of thought and behavior, face academic and

social life challenges and efficiently fulfill their duties using their existential forces and spirituality (Laranjeira & Querido, 2023).

Furthermore, various studies have selected factors for examination based on their type of impact on student creativity, dividing them into two categories. The first includes variables external to the learner, and the second involves variables related to the learner themselves, known as "personal factors," such as motivation and self-efficacy (Mahmoodi & Ghaemi, 2017). According to some studies, motivation and motivational variables affect learners' cognitive, metacognitive, and academic functions (Zeqeibi Ghannad et al., 2020). Among these, the perception of competence is considered one of the dimensions of the self. It refers to an individual's perception of their abilities and skills to control their environment and situation and how capable and effective they perceive themselves in a specific context (Liem, 2022). An individual's perception of their competence varies across different domains, with cognitive, physical, and social competence being the most important (Sabzi & FouladChang, 2019). Sun and colleagues (2020) found a positive role of self-perception and cognitive flexibility in divergent thinking among students (Sun et al., 2020). Similarly, Jnaneswar and Ranjit (2023) report that an individual's perception of their abilities and problem-solving skills positively affects creative thinking (Jnaneswar & Ranjit, 2023).

Contrary to the past focus on cognitive factors in creativity and innovation, recent research also emphasizes the importance of personality factors (Bong et al., 2014). Perfectionism is a personality and motivational trait that influences an individual's behavior and is characterized by striving for flawlessness, setting excessively high performance standards, and a tendency toward critical self-evaluation (Stoeber et al., 2020). If positive, perfectionism can be associated with higher self-confidence and resilience, empowering individuals to face academic and social life challenges more effectively. Research findings have confirmed the existence of adaptive (positive) perfectionism in contrast to neurotic (negative) perfectionism. Positive perfectionism involves high but attainable personal standards, a tendency for order and organization, satisfaction with one's performance, striving for excellence, and an orientation towards opportunities. In contrast, negative perfectionism is associated with high and unrealistic standards, excessive concern about mistakes and personal flaws, a perception of a significant gap between personal performance and standards, and pathological doubt (Egan et

al., 2015). Additionally, some scientific reports indicate that negative perfectionism adversely affects critical thinking (Lv et al., 2023), and high perfectionistic expectations, when coupled with the activation of negative emotions, can lead to increased stress and negative effects in cognitive and metacognitive domains, including creative thinking (Lin et al., 2023).

A review of previous studies indicates that most have examined the relationship between constructs and creativity in a linear and direct manner, with few studies observed in Iran in this area. However, in the realm of human and cognitive issues, several factors may play an interactive role, suggesting that designing studies to assess the direct and indirect relationships between variables can lead to a more effective and precise understanding of their interrelations and impact on each other. Examining motivational and personality variables as factors influencing creativity and the interactive relationships between these variables within a comprehensive model in this research helps to better understand the antecedent factors of creativity. Since existing research has not yet demonstrated the relationship between these variables in an organized model with inter-variable relationships, studying these relationships is necessary. The purpose of the current study was to investigate the development of a student creativity model based on the perception of competence mediated by perfectionism.

2. Methods and Materials

2.1. Study Design and Participants

The present study, in terms of its objective, was fundamental and, in terms of data collection methodology, was descriptive-correlational. The study population included all male and female undergraduate students in architecture faculties across Tehran in the academic year of 2020-2021. From among the architecture faculties in Tehran, two were selected randomly using cluster sampling, and from all undergraduate students, 300 individuals were chosen as the sample (150 females and 150 males).

2.2. Measures

2.2.1. Creativity

This scale was developed by Abedi in 1993 and consists of four components: fluency, elaboration, originality, and flexibility. Items are scored 1, 2, and 3. The total scores obtained in each dimension represent the testee's score in

that dimension, and the total scores of the testee in all four dimensions represent the overall creativity score. The range of total creativity scores for each testee varies from 60 to 180. The reliability of Abedi's creativity test was obtained through retesting of Tehran's middle school students in four sections of the test: fluency (0.85), originality (0.82), flexibility (0.84), and elaboration (0.80). In validating the test, the Torrance Creativity Test was administered to 200 of these students, using the Torrance Test as a concurrent validity index, resulting in a correlation coefficient of 0.46 between the total scores of the new test and the Torrance Test scores (Balverdi & Babakhani, 2020; Barzegar et al., 2015; Beh-Pajooch et al., 2011). In this study, the Cronbach's alpha coefficient of this instrument was calculated to be between 0.61 and 0.65.

2.2.2. Self-Perception of Competence

This scale was developed by Harter in 1982 and includes 28 questions that measure four subscales: satisfaction with life (7 questions); cognitive (academic) (7 questions); social (7 questions); and physical (7 questions). The questionnaire is scored on a 4-point Likert scale (from 1 to 4). In Iran, the reliability of the scale was examined using Cronbach's alpha coefficient, resulting in a coefficient of 0.70, indicating internal consistency and reliability of the Self-Perception of Competence Scale. Additionally, convergent validity with the academic achievement variable yielded a correlation coefficient of 0.20, significant at the 0.01 level. In another study, the reliability of the scale was examined using Cronbach's alpha coefficient, which reported a coefficient of 0.93 (Bahadormotlagh et al., 2013; Bay et al., 2017; Harter,

1982). In the present study, the Cronbach's alpha coefficient of this tool was calculated to be 0.68.

2.2.3. Perfectionism

This scale was developed by Terry-Short et al. in 1995 and consists of 40 questions measuring two subscales: positive perfectionism and negative perfectionism. The questionnaire is scored on a 5-point Likert scale, with scores ranging from 1 (strongly disagree) to 5 (strongly agree). Terry-Short et al. (1995) reported the reliability of the scale through a two-week retest as 0.86. Also, Besharat (2003) confirmed the validity of the scale and reported Cronbach's alpha coefficients for the positive and negative subscales as 0.91 and 0.88, respectively, in a sample of 212 students. In this study, the Cronbach's alpha coefficient for negative perfectionism was calculated to be 0.67 (Rafezi & Hakami, 2020; Terry-Short et al., 1995).

2.3. Data analysis

For data analysis, descriptive statistics, Pearson correlation coefficient, and path analysis were used. Additionally, the AMOS and SPSS version 24 software were utilized for data analysis.

3. Findings and Results

In this study, 150 participants (50%) were female and 150 (50%) were male. The average age of the sample was 21.35 years with a standard deviation of 2.03. Table 1 presents the mean, standard deviation, skewness, and kurtosis of the variables used in the research.

Table 1

Central and Dispersion Indices

Variables	Mean \pm Standard Deviation	Skewness	Kurtosis
Negative Perfectionism	18.22 \pm 122.13	0.104	-0.060
Positive Perfectionism	15.34 \pm 105.87	0.304	-0.097
Perception of Competence	11.34 \pm 79.48	0.595	-0.305
Creativity	28.16 \pm 69.49	0.915	-0.326

The results in Table 1 indicate that none of the research variables deviate significantly from a normal distribution, with skewness within the range of (-2, 2) and kurtosis within the range of (-3, 3). Therefore, it is assumed that the data distribution is normal. The Variance Inflation Factor (VIF) was used for the linear relationship between predictor

variables, with values for each variable being less than 10. The Tolerance statistic for this study was approximately 0.2. Univariate outlier analysis was conducted using frequency tables, which did not identify any outliers. Table 2 presents the correlation matrix of the research variables.

Table 2*Pearson Correlation Coefficients of Research Variables (Criterion Variable: Creativity)*

Predictor or Mediating Variable	Correlation Coefficient	p
Perception of Competence	0.621	0.004
Positive Perfectionism	0.560	0.014
Negative Perfectionism	-0.347	0.432

According to Table 2, Pearson correlation coefficients showed a positive and significant relationship between positive perfectionism and creativity among students;

similarly, the relationship between the perception of competence and creativity among students was positive and significant at the 0.05 level.

Table 3*Fit Indices in the Model*

Model Fit Indices	χ^2/df	GFI	AGFI	NFI	CFI	RMSEA
Obtained Value	0.26	0.95	0.96	0.91	0.93	0.07
Acceptable Limit	< 3	> 0.9	> 0.9	> 0.9	> 0.9	< 0.1

Considering the model fit characteristics reported in Table 3, the model's fit for predicting creativity is relatively good, and the presented conceptual model provides a

suitable framework for examining creativity. Table 4 reports the direct effects of the variables.

Table 4*Path Coefficients of Direct Effects between Research Variables in the Proposed Model*

Path	Beta Coefficient	Standard Error	Critical Ratio	p
Positive Perfectionism → Creativity	0.376	0.083	14.642	0.005
Negative Perfectionism → Creativity	0.042	0.012	2.054	0.327
Perception of Competence → Creativity	0.337	0.073	11.453	0.006
Perception of Competence → Perfectionism	0.185	0.044	6.402	0.004

Based on Table 4, the direct paths between positive perfectionism ($p = 0.005$, $\beta = 0.376$) and perception of competence ($p = 0.006$, $\beta = 0.337$) with creativity are significant; the direct path between perception of competence ($p = 0.004$, $\beta = 0.185$) and perfectionism is also

significant. The Bootstrap test in the macro program was used to examine the mediating effect of positive perfectionism in the relationship between perception of competence and creativity.

Table 5*Indirect Relationships Mediation Using Bootstrap Method*

Indirect Path	Data	Bootstrap	Bias	Lower Bound	Upper Bound
Perception of Competence → Positive Perfectionism → Creativity	0.0211	0.0125	0.0001	0.0514	0.0316

According to Table 5, the Bootstrap results suggest that if the upper and lower limits of this test are both positive or both negative, and zero does not lie between these two limits, then the indirect causal path will be significant. This rule applies to the effect of perception of competence on creativity with the mediating role of positive perfectionism. Therefore, it can be said that positive perfectionism plays a

mediating role in the relationship between perception of competence and students' creativity.

4. Discussion and Conclusion

The present study aimed to explain the creativity model of students based on the perception of competence with the

role of perfectionism. The results showed that there is a positive and significant relationship between positive perfectionism and creativity among students. These findings are consistent with the results of previous findings (Alborzi, 2015; Sabzi & FouladChang, 2019). This can be explained by the fact that individuals with positive perfectionism set standards for themselves, but instead of focusing on whether they achieve these standards, the effort to reach the goal is what matters to them. They enjoy striving for and competing for excellence and perfection, while also recognizing their personal limitations and striving to select high, yet adaptable and reasonable standards. In other words, individuals with positive perfectionism compete with themselves rather than others; whereas individuals with negative perfectionism are more concerned about making mistakes, never feel victorious, are not satisfied even if they perform better than others, constantly criticize themselves, and due to unrealistic expectations, are never pleased with their performance. These perfectionists experience high levels of anxiety and fear of failure, and suffer from depression and neuroticism.

Another finding of this study was that there is a significant relationship between the perception of competence and creativity among students. This finding is consistent with the results of previous studies (MohammadRezaei et al., 2014). To explain this finding, it can be stated that the increase in ego strengths (perception of competence as part of ego strength) and, in other words, cognitive development causes an individual to demonstrate more thinking and decision-making skills in terms of initiative and creativity in various matters. Consequently, the level of creativity and creative thinking in an individual may decrease due to the individual's greater awareness of the consequences of a problem and the necessary precautions about it. Executive functions, especially spatial thinking and information processing, allow for maintaining a goal in mind and performing actions to achieve that goal, while other information that may distract is ignored. Part of this ignored information may be related to creativity and creative thinking activities (Benedek et al., 2014). On the other hand, it seems that creative thinking skills and creativity, alongside these cognitive concepts, are one of the capabilities and competencies associated with the perception of competence. According to Costa and McCrae (2008), it can be said that perception of competence is related to the personality factor of openness. Openness to experience among personality traits has the highest predictive power for creativity. Indeed, openness to experience is related to fantasy, aesthetics, feelings, actions, and ideas. Creativity means invention,

innovation, creation, and creativity, and is defined as an individual's ability to generate ideas, theories, insights, or to reconstruct in the sciences and other fields (Costa & McCrae, 2008). Therefore, considering the definition and concept of creativity and openness to experience, the positive relationship between the construct of perception of competence and creativity is understandable.

Another result of this study was that there is a significant and positive relationship between the perception of competence and positive perfectionism. To explain this finding, it can be said that the perception of competence includes the individual's skills, attitudes, and cognitions of their ability that lead to successful outcomes in various situations and improve students' self-esteem and confidence, thereby reducing anxiety. Individuals who believe in their efficiency in solving problems do not significantly lose their analytical thinking when faced with stressful events, but those who doubt their abilities to solve forthcoming problems think and act in a confused manner with a mindset of shoulds and should nots and exhibit excessive perfectionism. In fact, the image of an anxious and perfectionist personality represents an individual worried about their capability and fearing failure in successful performance of future activities, indicating low perception of competence. Conversely, according to Bandura's theory, when an individual has a high perception of competence, not only are they not afraid of facing upcoming educational and social events, but they also effectively move towards experiencing these events, hence feeling no need to have a complete and all-encompassing sense of mastery over all matters because the individual believes in their capabilities even in the event of failure and does not fear facing imperfections and failures. However, individuals with a weak perception of competence and ego strength, due to low self-esteem, fear failure and therefore behave in a rigid and extreme manner of shoulds and should nots, showing abnormal and excessive perfectionism.

5. Limitations & Suggestions

This research, like other studies, faced limitations; the first limitation of the present study was the use of questionnaires for data collection, which could negatively affect the accuracy of the collected information; another limitation of this study was related to the study population. This study was limited to undergraduate students of architecture faculties in Tehran, limiting the generalization of the results to other members of society and other students.

Also, this study was of a modeling type, and in such studies, causal conclusions cannot be drawn as in experimental studies, so caution should be exercised in generalizing results and concluding from the relationship between variables. It is suggested that future studies replicate this study in a mixed-methods approach and use both interviews and questionnaires for data collection. Future studies should also extend this research to include student populations in addition to students.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contributed in this article.

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