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ORIGINAL RESEARCH

# Perceived Organizational Support and Creativity of Science-Technology Talents in the Digital Age: The Effects of Affective Commitment, Innovative Self-Efficacy and Digital Thinking

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**Background:** The impact of perceived organizational support on the creativity of science-technology talents in the digital era is an important domain for fostering innovation power and the long-term competitive advantage of enterprises. The main purpose of this study is to reveal the "black box" mechanism of perceived organizational support on the creativity of science-technology talents in the digital environment, guide enterprises to attach importance to perceived organizational support and enhance the creativity of science-technology talents.

**Methods:** Based on resource conservation theory and social exchange theory, this study took the science-technology talents of Chinese high-tech enterprises as the research object, combined 380 matching data of science-technology talents and supervisors, and used AMOS, MPLUS, and SPSS software to test all hypotheses.

**Results:** Perceived organizational support has a significant positive impact on the creativity of science-technology talents, affective commitment and innovative self-efficacy. Affective commitment and innovative self-efficacy have significant positive effects on the creativity of science-technology talents. Digital thinking positively moderates the relationship between perceived organizational support and affective commitment, innovative self-efficacy. Affective commitment and innovative self-efficacy play a moderated mediation role between perceived organizational support and the creativity of science-technology talents.

**Conclusion:** Perceived organizational support promotes the creativity of science-technology talents through affective commitment and innovative self-efficacy, which is moderated by digital thinking. These findings not only help deepen and expand the theoretical research on perceived organizational support and creativity, but also inspire managers to guide science-technology talents to work creatively from the aspects of affective commitment, innovative self-efficacy and digital thinking.

**Keywords:** perceived organizational support, talent creativity, affective commitment, innovative self-efficacy, digital thinking

## Introduction

To cope with the digital age's increasingly complex and competitive markets, enterprises are constantly undergoing digital transformation and beginning to adopt and implement emerging digital technologies such as big data, cloud computing, and the Internet of Things to support their operations and strategies. In a dynamic social environment, enterprises rely on continuous innovation to efficiently use organizational elements and build core competencies. However, the cultivation and development of enterprise innovation capability cannot be achieved without individual creativity. Individual creativity refers to the novel and applicable ideas generated by individuals in the process of work, which is the micro-foundation of organizational innovation.[1] At the present stage, there are problems such as a lack of innovative motivation in enterprises, which is mainly due to the lack of creativity of enterprise employees.[2] Because there is a greater risk of creative activity failure, failure of creative activities means loss of employees' personal resources, and if the loss of resources is not compensated, it puts pressure on employees, negatively affecting their



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creativity and corporate innovation drive. As a result, in order to achieve sustainable innovation development, organizations require not only individual resource contributions from employees, but also compensatory resources from the external environment, such as various encouragements, support, and rewards,[3] and perceived organizational support to employees is one of the necessary conditions for innovation development.[4]

Perceived organizational support is a social resource that facilitates employees' creative activities,[5] as it represents the organization's concern for employees and recognition of their contributions. Some scholars believe that perceived organizational support is conducive to employee creativity,[3] which is expressed in the form of enhancing perceived organizational support by providing resources to employees, and that employees who invest resources in creative activities are bound to increase their creative output and drive the development of corporate innovation. However, Khazanchi & Masterson proposed that there is no significant relationship between perceived organizational support and employee creativity.[6] Meanwhile, scholars lack in-depth analysis of the mechanisms underlying the relationship between perceived organizational support affecting employee attitudes and behaviors.[7] Perceived organizational support reflects the organization's evaluation of employees' job performance, which can have an impact on employees' self-perception of value,[8] and when employees feel their important position and value in the organization, they will be more likely to identify with the organization's goals and make an emotional investment,[9] thus enhancing organizational affective commitment. Affective commitment, as an intrinsic motivational element that influences organizational employee creativity, has a facilitating effect on the generation of individual creativity. Employees' innovative self-efficacy positively influences employees' innovative behavior,[10] and innovative self-efficacy can play a mediating role between contextual factors and individual creative activities.[11]

In addition, in the digital era environment, employees need not only to make efficient use of digital technology and digital devices to improve business efficiency but also to focus on cultivating digital thinking. Employees with digital thinking dialectically view the organization's evaluation and support for themselves, and form a positive perception of themselves. They are willing to work in a way that helps them produce more knowledge, and then come up with new ways to help the long-term growth of business innovation.

Science-technology talents refer to workers who have professional knowledge or skills, scientific thinking and innovation ability, engage in scientific and technological innovation activities, and contribute to the cause of science and technology and economic and social development. They mainly include those who are engaged in scientific research, technology development, engineering design, technology entrepreneurship, science and technology management, science and technology services, science popularization, and other scientific and technological activities. Science-technology talents, as typical representatives of high knowledge, high skills, and high contributions among enterprise employees, are directly responsible for enhancing organizational creativity and are an important source for accelerating enterprise growth, achieving breakthrough innovation, and achieving competitive advantage.[12,13] The creativity of science-technology talents refers to the behavior or ability of science-technology talents to perform creative activities.

Digital thinking implies dialectical and innovative ways of thinking, and dialectical thinking affects creativity,[14] and dialectical critical thinking shows a positive correlation with creativity.[15] In the digital era, science-technology talents with digital thinking can not only objectively view the organization's attitude toward them, as well as their status and value in the organization, and improve their emotional attachment to the organization, but they can also dialectically and critically view the vast amount of digital information, explore potentially useful information, improve resource utilization efficiency and innovation effectiveness, and enjoy innovative thinkers. The existing literature was primarily based on stressors,[16] work engagement,[17] and other perspectives to investigate the influencing factors of creativity without introducing elements of the digital era into the context of the digital era, and there were few studies on the creativity of science-technology talents, as well as the mechanism of the role of perceived organizational support and creativity in the digital environment.

In summary, based on resource conservation theory and social exchange theory, this study empirically analyzes the direct influence of perceived organizational support on the creativity of science-technology talents, explores the mediating relationship between perceived organizational support and the creativity of science-technology talents in terms of affective commitment and innovative self-efficacy, and examines the moderating effect of digital thinking on the relationship between perceived organizational support and affective commitment and innovative self-efficacy. The study helps to uncover the "black box" mechanism of

perceived organizational support on the creativity of science-technology talents in the digital era, as well as to enrich theoretical research on affective commitment, innovative self-efficacy, and creativity, and to provide some useful insights for organizational management practice.

# Theoretical Basis and Hypotheses Development

## Perceived Organizational Support and Creativity

Perceived organizational support is a belief about an organization that values employees' contributions and cares about their well-being.[7] Creativity composition theory states that factors that influence creativity include knowledge, skills, emotions, and cognitive style.[18] Perceived organizational support affects employees' cognitive styles, work attitudes, and extra-role behaviors.[19] When employees perceive the support given by their organizations, they feel happy,[20] generate positive emotions such as optimism and confidence,[21] and are more likely to form positive perceptions of the company's support for their creativity,[22] which in turn stimulates employees' creativity.[23–26] Organizations can support their employees accordingly through knowledge and experience sharing, relevant skills training, and hardware equipment. On the one hand, these skills and knowledge can help employees be more creative and successful in their creative work. On the other hand, when employees see that their company is supportive, they believe that their own subjective conditions are the most important factor in achieving innovation goals and work hard to repay the favor.[27]

Combined with resource conservation theory, individuals are extremely resource-loaded when engaging in creative activities and invest a lot of time while still bearing a high risk of failure.[28] Employees who use more time consume more resources, and when creative activities fail, they not only do not receive compensation for lost resources, but they may also face poor evaluations from leaders and coworkers, adding to their stress.[29] In turn, individuals invest fewer resources in creative activities when they are under greater pressure, which may reduce the creative energy of science-technology talents. Perceived organizational support is a valuable social resource that not only compensates for the depleted resources of science-technology talents, but when science-technology talents have sufficient resources, they are more willing to put them to creative work, forming a value-added resource cycle and producing creative results. In summary, this study proposes the following hypothesis.

Hypothesis 1: Perceived organizational support has a significant positive effect on the creativity of science-technology talents.

## Perceived Organizational Support, Affective Commitment and Creativity

Affective commitment is an underlying work attitude that manifests itself as an individual's identification with organizational goals and values, emotional attachment, and commitment to the organization,[30] and it arises from individual work practices. Existing research suggests that perceived organizational support can have an impact on affective commitment and that perceived organizational support predicts employees' affective commitment mainly through two intrinsic psychological mechanisms: self-enhancement and social exchange.[19] Social exchange theory assumes that human interaction behavior is rational behavior that calculates gains and losses and that people interact with each other behaviorally to satisfy their own interests; self-enhancement theory emphasizes the motivation of people to view themselves positively.[31] Employees judge their status and value in the organization by receiving signals of respect and recognition from the organization, and this support reinforces employees' perceived competence and self-worth[9] and motivates them to self-improvement. In exchange, this positive perception of employees increases their work engagement in the situation and raises their affective commitment to the organization. Conversely, employees withdraw psychologically and emotionally from situations that threaten their positive self-perceptions and reduce their affective commitment to the organization.[5] At the same time, the organization's attention and concern for employees not only increase their affective input at work[32] and develop an emotional attachment toward their organization,[33] but also enhance their sense of responsibility and bring about creative performance.[34] Based on this, this study proposes the following hypothesis:

Hypothesis 2: Perceived organizational support has a significant positive effect on affective commitment.

Affective commitment has an impact on employees' psychological beliefs as well as their organizational outcomes,[35] and it is an important factor in producing organizational citizenship behavior[36] and creativity. While there is debate among scholars on the definition of the relationship between affective commitment and creativity, most scientists agree that affective commitment leads to favorable results for creativity, while a few scholars disagree. From the perspective of social exchange theory, affective commitment reflects the social exchange relationship between organizations and employees, and the level of affective commitment reflects the quality of social exchange between organizations and employees. If affective commitment is low, employees are limited to completing the work required by their job duties, exhibit in-role behavior,[36] and lack intrinsic motivation for organizational citizenship behavior. Creative activity is an extra-role behavior, and a lower affective commitment implies a lower sense of dedication and responsibility among employees, which is not conducive to creative activity. On the one hand, high affective commitment indicates the high quality of the social exchange relationship between the organization and employees, and the behavior of employees is regulated by external factors,[5] which promote employees to form a high sense of obligation. At this time, in order to maintain their own image and repay the organization, employees are more willing to invest time and energy in their work to improve work performance. At the same time, employees do creative things that are more risky and require more resources, and the depletion of resources makes employees less creative.[1]

On the other hand, higher affective commitment reflects employees' high levels of identification and emotional attachment to organizational goals and values.[37] This makes employees tend to contribute more to the organization, face problems at work and solve them, and creativity is generated in the process of solving problems.[1] Therefore, high affective commitment is conducive to the creativity of science and technology talents, and good social exchange relationships make them feel valued and cared for, so they work hard to increase their creative output in return for the organization. Based on this, this study proposes the following hypothesis:

Hypothesis 3: Affective commitment has a significant positive effect on the creativity of science-technology talents.

As mentioned earlier, perceived organizational support enhances employees' affective commitment to the organization, and affective commitment becomes a psychological link between the organization and the employee.[38] Employees with strong perceived organizational support are able to demonstrate higher commitment[39] and greater creativity.[40] Lower levels of affective commitment are not conducive to employee creativity, and high levels of affective commitment can motivate employees to engage in creative activities to reward the organization. Organizational attention, rewards, and care for employees translate into employee performance in creative activities,[34] improve employees' perceptions of the organization, enhance employees' organizational identity, which is then internalized into a sense of emotional belonging,[41] and enhance affective commitment. Meanwhile, affective commitment leads to employees' tendency to share knowledge,[42] increase work initiative and motivation, engage in more innovative activities, and generate more new ideas and innovative suggestions,[43–46] using intelligence at work to form creative behaviors[47] and creatively carry out activities. In summary, this study proposes the following hypothesis:

Hypothesis 4: Affective commitment plays a mediating role between perceived organizational support and the creativity of science-technology talents.

## Perceived Organizational Support, Innovative Self-Efficacy and Creativity

Innovative self-efficacy, first proposed by Tierney and Farmer, is an extension and expansion of self-efficacy and refers to an individual's beliefs about whether he or she has the relevant ability to produce creative outcomes at work.[48,49] Innovative self-efficacy can be enhanced through persuasion, psychological states, and experiences of success. Support from the organization, such as encouragement and promotion of innovation, has a strong persuasive effect on employees[50] and drives them to carry out creative activities. Stronger support from the organization means stronger tolerance for employees, which helps to reduce stress and aversion to creative activities and thus enhances innovative self-efficacy. Furthermore, when employees receive support from the organization in terms of knowledge and skill sharing experience, etc., it facilitates the development of innovative self-efficacy in the workplace. What's more, when

employees are supported by the organization in terms of knowledge, skills, and experience sharing, they are able to effectively overcome difficulties in creative activities, increase job satisfaction[51–53] and the probability of success, reap the benefits of successful experiences,[54] and maintain a high level of effectiveness.

In addition, innovative self-efficacy as a psychological capital[55] can be effectively developed to form a unique psychological advantage for individuals.[21] Perceived organizational support boosts innovative self-efficacy by raising individual psychological capital.[56,57] When scientific and technical talents gain valuable resources within the organization, such as knowledge and skills, they boost their recognition in creative work, promote innovative self-efficacy, improve the probabilities of resource augmentation spiral, and minimize the likelihood of resource loss. Based on this, this study proposes the following hypothesis:

Hypothesis 5: Perceived organizational support has a significant positive effect on innovative self-efficacy.

Employees who engage in creative activities frequently need to invest a large amount of time, energy, and continuous effort, as well as face a high risk of failure,[32] all of which require strong self-confidence. However, innovative self-efficacy can provide a source of motivation for this belief and meet the conditions for creative output. The higher the self-efficacy of innovation, the more resources employees have, which can effectively counteract the various pressures arising from creative activities,[32] reduce the negative effects of resource depletion, and increase employee creativity. The principle of resource investment proposes that if individuals have a high sense of self-efficacy, they usually have a high level of confidence in their abilities and are more inclined to invest resources to prevent the loss of resources in the future and promote creativity. Therefore, similar to creative self-efficacy,[58] employees with high innovative self-efficacy respond to difficulties and challenges in creative activities by adopting a more positive approach such as innovative thinking, thus contributing to creative behavior and performance.[59] Based on this, this study proposes the following hypothesis.

Hypothesis 6: Innovative self-efficacy of science-technology talents has a significant positive effect on their creativity.

As mentioned earlier, perceived organizational support positively affects the innovative self-efficacy and creativity of science-technology talents, and the innovative self-efficacy of science-technology talents promotes the formation of creativity. Therefore, on the one hand, when science-technology talents are supported by the organization, their knowledge, skills, and successful experience increase, and they are more confident in achieving their creative goals, which enhances their innovative self-efficacy. On the other hand, as a kind of innovative psychological capital, the increase in innovative self-efficacy makes science-technology talents more inclined to invest more resources in carrying out creative activities,[60] so as to realize the value-added of resources and enhance creativity. There is a mediating role of innovative self-efficacy between situational factors and individual creativity,[11] ie, perceived organizational support affects the creativity of science-technology talents by enhancing innovative self-efficacy. Based on this, this study proposes the following hypothesis:

Hypothesis 7: Innovative self-efficacy plays a mediating role between perceived organizational support and the creativity of science-technology talents.

## Digital Thinking's Moderating Effect

The problems faced by organizations in the digital era are becoming increasingly complex and varied, and the digital environment places higher demands on the digital literacy and problem-solving skills of technology professionals. Digital thinking characterizes the fundamental content of digital literacy, which mainly contains two types of thinking: dialectical and innovative. On the one hand, science-technology talents with dialectical thinking can more objectively and rationally confirm their status and value in the organization when they perceive the organization's respect and recognition, strengthen their sense of self-identity, and increase their emotional investment in their work. Simultaneously, in the process of creative problem solving, science-technology talents must extract useful knowledge from a vast amount of digital information, which is influenced by their dialectical thinking. They must

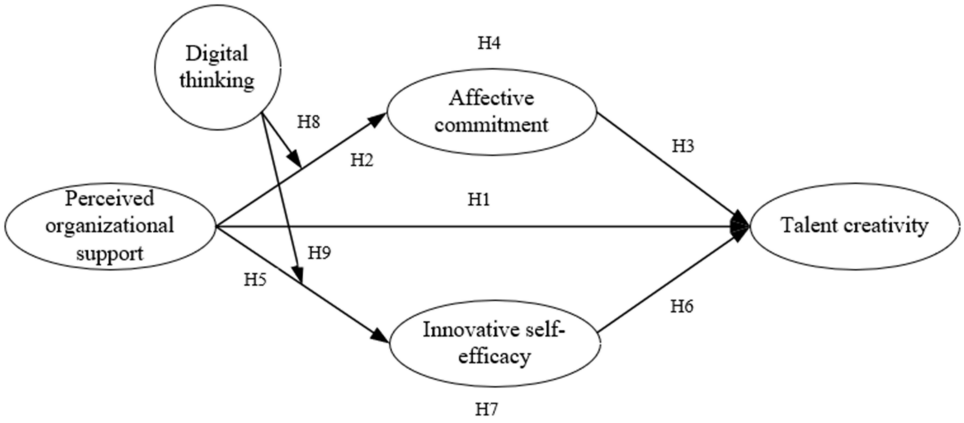


**Figure 1** Theoretical model of the impact of perceived organizational support on the creativity of science-technology talents.

comprehend the nature and source of information resources[61] through dialectical inquiry and "de-graining." This helps to increase the confidence and effectiveness of scientific and technical talents in innovation, and enhances their emotional connection with the organization, thus contributing to the output of creative results and improving business performance. On the contrary, if science-technology talents have a single mind and insufficient knowledge, they are likely to be caught in a sea of information and feel overwhelmed and unable to solve many problems in reality, which reduces self-identity and innovation self-confidence and negatively affects affective commitment and innovative self-efficacy.

On the other hand, science-technology talents with high perceived organizational support have the courage to break out of their stereotypes and use new thinking to face difficult problems that they have not encountered before. They are not blindly confident. They are motivated to think creatively, increase the frequency of innovation, use existing knowledge flexibly and create new knowledge to overcome difficulties. They focus on enhancing communication with organizational members to promote knowledge spillover, which is conducive to improving innovation and enhancing emotional attachment to the organization during the creative problem-solving process. Based on this, this study proposes the following hypothesis:

Hypothesis 8: The relationship between perceived organizational support and affective commitment is positively moderated by digital thinking.

Hypothesis 9: The relationship between perceived organizational support and innovative self-efficacy is positively moderated by digital thinking.

To sum up, we can build a theoretical model of the impact of perceived organizational support on the creativity of science-technology talents, as shown in Figure 1.

# Methods

## Research Procedures and Samples

The research data came from the science-technology talents and their direct supervisors engaged in scientific and technological research and development and scientific and technological service activities in China's high-tech enterprises. The surveyed enterprises are mainly located in Beijing, Shanghai, Guangdong, Yunnan, Jilin, Anhui, and other places, mainly involving biotechnology, high-end equipment, medical devices, and high-tech consulting services. Such industries have a complicated and changing market environment, and the science-technology talents of their enterprises frequently face various unstructured challenges. Organizations also develop policies and give resources to encourage and support science-technology talents' innovative activities. The study used two types of questionnaires: one was the employee version, which was completed by the science-technology talents and covered basic information, perceived

organizational support, affective commitment, innovative self-efficacy, and digital thinking. Another was the supervisor version, which was primarily used by the direct supervisor to evaluate the science-technology talents' creativity.

In order to ensure the success of the questionnaire matching, both the supervisor version questionnaire and the technological talent version questionnaire were assigned corresponding numbers. In the actual survey, the researcher first contacted the company's top management by phone to explain the background and content of the survey, and then sent the questionnaire with instructions to the target company's HR department via online or offline mail after obtaining support, and the department coordinated the distribution of the questionnaire. At the same time, during the process of questionnaire distribution, completion, and collection, the researcher kept in close contact with the contact person of the company through telephone, WeChat, and field visits to ensure the quality of the completed questionnaire.

The study collected 396 questionnaires for science-technology talents and 87 questionnaires for supervisors online and offline, ultimately obtaining 380 questionnaires for science-technology talents and 85 questionnaires for supervisors after excluding some invalid questionnaires. In the effective science-technology talent samples, men and women made up 61.1% and 38.9% of the samples, respectively. In terms of age distribution, 2.4% were under the age of 20, 39.7% were between the ages of 21 and 30, 37.6% were between the ages of 31 and 40, 16.8% were between the ages of 41 and 50, and 3.4% were over the age of 51. In terms of education, 6.6% had a high school education or less, 17.9% had a junior college education, 58.4% had a bachelor's degree, 14.5% had a master's degree, and 2.6% had a doctoral degree. In terms of working years, 7.6% had worked for one year or less, 19.5% for 1–3 years, 26.1% for 3–5 years, 26.3% for 5–10 years, and 20.5% for 10 years or more. In terms of job type, 20.8% were fundamental researchers, 27.6% were applied researchers and technology developers, 16.1% were science and technology management and service talents, 19.7% were comprehensive science-technology talents, and 15.8% were other science-technology talents. From the perspective of enterprise attributes, there were 254 science-technology talents in state-owned enterprises (66.8%) and 126 science-technology talents in non-state-owned enterprises (33.2%).

## Variable Measurement

The measurement scales used in this study are mostly mature scales and are often used in Chinese organizational contexts. In this study, some of the scale items were adjusted based on Chinese reality, and the scales were all scored on a five-point Likert scale, with 1 indicating very non-conforming and 5 indicating very conforming.

Perceived organizational support: this study borrowed from Lambert's[62] scale and adapted it to obtain six items, such as "The company values my opinion or suggestion", and the component reliability of this scale was 0.877.

Affective commitment: the scale adapted from Tsui et al[63] obtains six items, such as "I am proud to tell others that I am a member of the company", and the component reliability of this scale was 0.877.

Innovative self-efficacy: the scale developed by Tierney et al[49] was adjusted to obtain three items, such as "I believe I have the ability to solve problems creatively", and the component reliability of this scale was 0.803.

Digital thinking: digital thinking contained two major ways of thinking, dialectical and creative, and at this stage, scholars rarely developed scales specifically for measuring digital thinking. The study created a digital thinking scale based on the EU digital literacy framework and knowledge management theory. This scale includes three items: "I can think dialectically when working independently or in discussions with others", "I can use digital devices or technology to innovate in my work", and "I am usually able to acquire new knowledge or skills at work", with a component reliability of 0.783.

Creativity: the study adjusted the Zhou & George[1] measurement scale to get 9 items for direct supervisors to fill in, such as: "At work, he/she proposes to use new methods to achieve goals." This scale had a component reliability of 0.920.

# Data Analysis and Results

## Validity Test

On the one hand, this study applied the average variance extracted (AVE) to measure the convergent validity of the five latent variables. The AVE values of perceived organizational support (POS), affective commitment (AFC), innovative self-efficacy (ISE), digital thinking (DT), and creativity (CRE) were 0.544, 0.543, 0.579, 0.547, and 0.562, respectively.

**Table 1** Results of Confirmatory Factor Analysis

| Model | $X^2$ | df | $X^2$/df | RMSEA | CFI | GFI | AGFI |
|---|---|---|---|---|---|---|---|
| One factor model[a] | 1049.589 | 324 | 3.239 | 0.077 | 0.884 | 0.759 | 0.719 |
| Two factor model[b] | 738.919 | 323 | 2.288 | 0.058 | 0.934 | 0.868 | 0.845 |
| Three factor model[c] | 539.051 | 321 | 1.679 | 0.044 | 0.965 | 0.900 | 0.882 |
| Four factor model[d] | 452.983 | 318 | 1.424 | 0.033 | 0.978 | 0.919 | 0.904 |
| Five factor model[e] | 430.715 | 314 | 1.372 | 0.031 | 0.981 | 0.923 | 0.908 |

**Notes**: [a]POS+AFC+ISE+DT+CRE; [b]POS+AFC+ISE,DT+CRE; [c]POS,AFC+ISE+DT,CRE; [d]POS+AFC,ISE,DT,CRE; [e]POS,AFC,ISE,DT,CRE.

The AVE values of each latent variable were greater than 0.5, indicating that each variable had good convergent validity. On the other hand, this study also measured the discriminant validity among the variables through the confirmatory factor analysis method. The results of the confirmatory factor analysis are shown in Table 1. As shown in Table 1, the fit indices of the five-factor model ($X^2$/df = 1.372, RMSEA = 0.031, CFI = 0.981, GFI = 0.923, and AGFI = 0.908) were good, which was an optimal factor model. This indicated good discriminant validity among the potential variables.

## Descriptive Statistical Analysis

The results of descriptive statistical analysis of the control and latent variables are shown in Table 2. Among the variables, DT has the highest mean score of 3.475. With a maximum score of 5, the mean values of POS and CRE are 3.244 and 3.274, respectively, which reflects that there is room for further improvement in the perception of POS and expression of CRE for most of the participating science-technology talents. The mean scores of ISE and AFC are 3.365 and 3.367, respectively, which indicate that science-technology talents generally recognize their innovation ability and have an emotional connection with the organization. In summary, the actual findings are generally consistent with the theoretical reasoning. Furthermore, POS has a significant positive correlation with AFC ($r = 0.840$, $P < 0.01$), ISE ($r = 0.720$, $P<0.01$) and CRE ($r = 0.684$, $P<0.01$). AFC and ISE also have a significant positive correlation with CRE ($r = 0.683$, $P<0.01$; $r = 0.693$, $P<0.01$), which preliminarily supports the hypothesis of mediating effect.

## Common Method Bias Test

Scholars frequently use the Harman single factor method to determine whether a common method bias is significant, but the existing literature highlights the Harman single factor test's shortcomings.[64] As a result, this study employed the CFA comparison method to ascertain common method bias, which more precisely investigates the heterogeneity of the single

**Table 2** Results of Descriptive Statistical Analysis

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.Gen | – | | | | | | | | | | |
| 2.Age | 0.023 | – | | | | | | | | | |
| 3.Edu | 0.038 | −0.088 | – | | | | | | | | |
| 4.Wy | −0.046 | 0.343** | 0.163** | – | | | | | | | |
| 5.Jt | 0.139** | −0.044 | 0.049 | 0.046 | – | | | | | | |
| 6.Att | −0.012 | −0.057 | −0.188** | −0.194** | 0.035 | – | | | | | |
| 7.POS | 0.066 | −0.154** | 0.118* | 0.022 | 0.035 | 0.171** | – | | | | |
| 8.AFC | 0.057 | −0.162** | 0.075 | 0.042 | 0.030 | 0.173** | 0.840** | – | | | |
| 9.ISE | 0.014 | −0.077 | 0.089 | 0.006 | −0.009 | 0.150** | 0.720** | 0.725** | – | | |
| 10.DT | 0.010 | −0.113* | 0.152** | −0.006 | 0.022 | 0.131* | 0.749** | 0.773** | 0.808** | – | |
| 11.CRE | 0.070 | −0.157** | 0.118* | 0.005 | 0.029 | 0.252** | 0.684** | 0.683** | 0.693** | 0.723** | – |
| Mean | 1.389 | 2.792 | 2.887 | 3.326 | 2.821 | 1.332 | 3.244 | 3.365 | 3.367 | 3.475 | 3.274 |
| SD | 0.488 | 0.870 | 0.825 | 1.217 | 1.382 | 0.471 | 0.949 | 0.980 | 1.022 | 0.962 | 0.913 |

**Notes**: 1 represents gender; 2 represents age; 3 represents education level; 4 represents the working years; 5 represents job type; 6 represents enterprise attribute; 7 represents perceived organizational support; 8 represents affective commitment; 9 represents innovative self-efficacy; 10 represents digital thinking; 11 represents creativity. N=380; *P<0.05, **P<0.01.

**Table 3** Test Results of Common Method Variance

| Model | $X^2$ | df | $\Delta X^2$ | Δdf | P value |
|---|---|---|---|---|---|
| Single factor | 1049.589 | 324 | 618.874 | 10 | 0.000 |
| Multi factor | 430.715 | 314 | | | |

factor and multifactor models (Table 3). The chi-square difference between the two models was significant (P<0.001), which indicated that the multifactor model was applicable to use. This meant that the model used in the study was not seriously affected by the common method bias.

## Hypothesis Test

In order to reduce the problem of multicollinearity, this study standardized the variables and then used MPLUS and SPSS software for statistical analysis. The results of each model's hierarchical regression and mediating effect tests are shown in Table 4. The study used AFC and ISE as the dependent variables, and the control variables gender, age, education, working years, job type, enterprise attribute, and independent variable (POS) were included in the regression equation,

**Table 4** Hierarchical Regression and Mediating Effect Test

| | AFC | | ISE | | CRE | | |
|---|---|---|---|---|---|---|---|
| | Model1 | Model2 | Model3 | Model4 | Model5 | Model6 | Model7 |
| Step 1. Control variables | | | | | | | |
| XB | 0.141 | 0.018 | 0.043 | −0.065 | 0.161 | 0.066 | 0.086 |
| | (−0.103) | (0.058) | (0.105) | (0.075) | (0.101) | (0.077) | (0.070) |
| NL | −0.223*** | −0.062 | −0.089 | 0.052 | −0.189** | −0.065 | −0.071 |
| | (0.062) | (0.035) | (0.063) | (0.045) | (0.060) | (0.046) | (0.042) |
| JY | 0.086 | −0.037 | 0.131* | 0.023 | 0.169** | 0.074 | 0.073 |
| | (0.063) | (0.035) | (0.064) | (0.046) | (0.061) | (0.047) | (0.043) |
| NX | 0.115* | 0.045 | 0.042 | −0.019 | 0.081 | 0.027 | 0.025 |
| | (0.045) | (0.025) | (0.046) | (0.033) | (0.044) | (0.034) | (0.031) |
| LX | −0.004 | −0.003 | −0.021 | −0.021 | −0.008 | −0.007 | 0.001 |
| | (0.036) | (0.020) | (0.037) | (0.026) | (0.036) | (0.027) | (0.025) |
| XZ | 0.432*** | 0.072 | 0.377** | 0.062 | 0.614*** | 0.337*** | 0.300*** |
| | (0.109) | (0.062) | (0.111) | (0.080) | (0.107) | (0.083) | (0.075) |
| Step 2. Main effect | | | | | | | |
| POS | | 0.828*** | | 0.723*** | | 0.639*** | 0.209*** |
| | | (0.029) | | (0.037) | | (0.038) | (0.065) |
| AFC | | | | | | | 0.200** |
| | | | | | | | (0.066) |
| ISE | | | | | | | 0.365*** |
| | | | | | | | (0.051) |
| Overall F | 5.530 | 130.762 | 2.800 | 58.222 | 8.547 | 52.098 | 58.636 |
| $R^2$ | 0.082 | 0.711 | 0.043 | 0.523 | 0.121 | 0.495 | 0.588 |
| ΔF | | 810.168 | | 373.954 | | 275.648 | 41.658 |
| $\Delta R^2$ | | 0.629 | | 0.480 | | 0.374 | 0.093 |
| Bootstrap result of mediating effect | | | | | | | |
| Path | | Effect | SE | LL95% CI | UL95% CI | Significant | |
| Path1: POS→AFC→CRE | | 0.321 | 0.054 | 0.213 | 0.429 | yes | |
| Path2: POS→ISE→CRE | | 0.299 | 0.047 | 0.207 | 0.394 | yes | |
| Contrast | | 0.021 | 0.096 | −0.167 | 0.212 | no | |

**Note**: N=380, *P<0.05, **P<0.01, ***P<0.001 (two-tailed).

respectively, to obtain Model 1–Model 4. With creativity as the dependent variable, the study included POS, AFC, ISE, and control variables in the regression equation to obtain Model 5-Model 7.

As shown in Table 4, POS has a significant positive effect on the CRE (Model6: β=0.639, p<0.001), and hypothesis 1 holds. POS has a significant positive effect on AFC and ISE (Model2: β=0.828, p<0.001; Model4: β=0.723, p<0.001), and hypotheses 2 and 5 are supported. AFC and ISE have a significant positive effect on the CRE (Model7: β=0.200, p<0.01; β=0.365, p<0.001), and hypotheses 3 and 6 are supported. It can be concluded that the mediating effects of affective commitment and innovative self-efficacy are significant between perceived organizational support and creativity of science-technology talents, respectively, so hypothesis 4 and 7 hold.

Meanwhile, this study, based on the test proposed by Hayes[65] to repeat the sampling 5000 times in the bootstrap procedure to mediate the significance of the effect. The results of the Bootstrap test show that on the mediating path of AFC, with a 95% confidence interval not containing 0 (CI of [0.213, 0.429]) and the mediating effect of AFC is significant (β=0.321). Hypothesis 4 is fully tested. On the mediating path of ISE, with a 95% confidence interval not containing 0 (CI [0.207, 0.394]), and the mediating effect of ISE is significant (β=0.299). Hypothesis 7 is fully tested. In addition, due to the difference in the mediating effect of AFC and ISE containing 0 at the 95% confidence interval (CI [−0.167, 0.212]). This means there is no significant difference in the mediating effect of AFC and ISE.

To investigate whether there is a moderating effect of DT on AFC and ISE, this study used AFC and ISE as dependent variables, respectively, and included the control variables, POS, DT, and their interaction terms in the regression equation to construct models 1–8 (Table 5). As can be seen from Table 5, the coefficients of the interaction terms of POS and DT all pass the 5% significance level test (Model4: β=0.762, p<0.001; Model8: β=0.421, p<0.05), and the positive effects of the interaction terms of POS and DT on both AFC and ISE are significant. Therefore, DT plays a positive moderated role between POS and AFC, ISE, that is, hypothesis 8 and 9 are supported.

In order to visualize the moderating effect of DT between POS and AFC, ISE, this study plotted the relationship between POS and AFC, ISE at different DT levels at a series of points, one standard deviation below the POS mean, POS mean and one standard deviation above the POS mean, respectively (Figures 2 and 3). Figures 2 and 3 show that the positive effect of POS on AFC and ISE was weak when DT was at a low level. As the level of DT increases, the positive effect of POS on AFC and ISE also increases, ie, the positive modulation effect of DT on AFC and ISE was significant.

**Table 5** Hierarchical Regression Results of Moderating Effect

| | AFC | | | | ISE | | | |
|---|---|---|---|---|---|---|---|---|
| | **Model1** | **Model2** | **Model3** | **Model4** | **Model5** | **Model6** | **Model7** | **Model8** |
| Step 1. Control variables | | | | | | | | |
| XB | 0.069 | 0.009 | 0.024 | 0.030 | 0.021 | −0.032 | −0.004 | −0.001 |
| NL | −0.194*** | −0.054 | −0.063* | −0.069* | −0.077 | 0.045 | 0.029 | 0.026 |
| JY | 0.071 | −0.030 | −0.056* | −0.051 | 0.108* | 0.019 | −0.028 | −0.025 |
| NX | 0.140* | 0.054 | 0.069* | 0.076** | 0.052 | −0.023 | 0.004 | 0.008 |
| LX | −0.005 | −0.005 | −0.005 | −0.010 | −0.029 | −0.029 | −0.030 | −0.032 |
| XZ | 0.204*** | 0.034 | 0.030 | 0.049 | 0.178** | 0.029 | 0.023 | 0.033 |
| Step 2. Main effect | | | | | | | | |
| POS | | 0.828*** | 0.575*** | 0.107 | | 0.723*** | 0.265*** | 0.006 |
| DT | | | 0.340*** | −0.003 | | | 0.615*** | 0.425*** |
| Step 3. Moderating effect | | | | | | | | |
| POS*DT | | | | 0.762*** | | | | 0.421* |
| F | 5.53 | 130.762 | 147.596 | 138.845 | 2.800 | 58.222 | 101.301 | 91.172 |
| R2 | 0.082 | 0.711 | 0.761 | 0.772 | 0.043 | 0.523 | 0.686 | 0.689 |
| ΔF | | 810.168 | 77.413 | 17.219 | | 373.954 | 192.763 | 3.868 |
| ΔR2 | | 0.629 | 0.05 | 0.011 | | 0.480 | 0.163 | 0.003 |

**Note**: N=380, *P<0.05, **P<0.01, ***P<0.001.

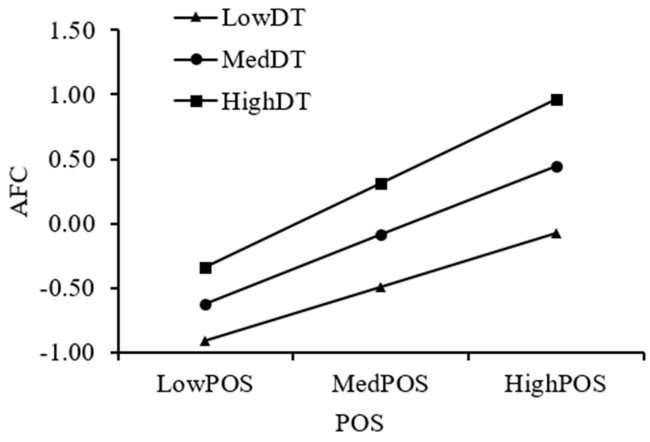


**Figure 2** Moderating effect (POS-AFC).

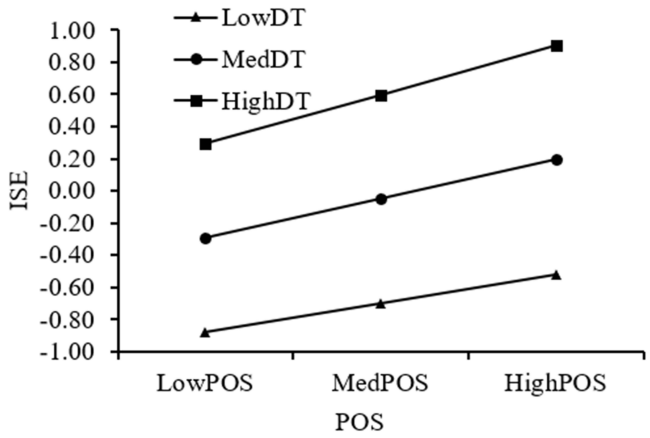


**Figure 3** Moderating effect (POS-ISE).

To more visually demonstrate the positive effect of DT on the slope of POS, AFC, and ISE, the study further drew Johnson-Neyma plots of the moderating effect of DT in this study (Figures 4 and 5). Where the slope values of POS on AFC and ISE increase as the value of DT increases, and the moderating effect of DT between POS and ISE was significant when DT was greater than −1.46. This again shows that the more DT there is, the more it has a positive effect on POS, AFC, and ISE.

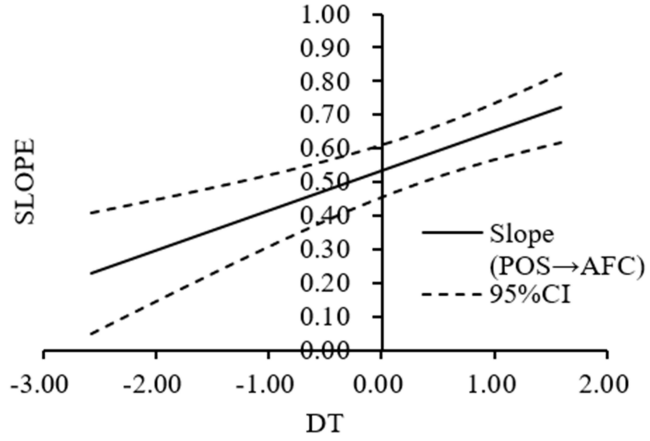


**Figure 4** Moderating effect (POS-AFC) (J-N).

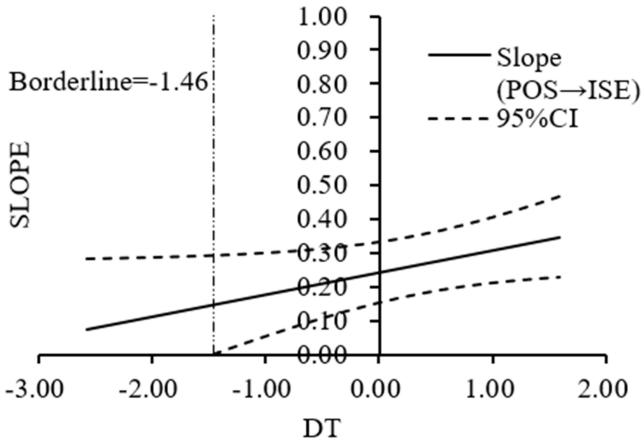


**Figure 5** Moderating effect(POS-ISE) (J-N).

Since there was a positive moderating effect of DT between POS, AFC, and ISE, AFC and ISE showed a moderated mediation effect in this study. The study calculated the conditional indirect effects at different levels of moderating variables in the Bootstrap program and tested the significance of the moderated mediation effect (Table 6). When DT is one standard deviation below the mean, the mean, and one standard deviation above the mean, the 95% confidence intervals are [0.025, 0.148], [0.034, 0.178], and [0.042, 0.213] for the mediation path of AFC. For the mediation path of ISE, the 95% confidence intervals are [0.014, 0.121], [0.044, 0.139], and [0.064, 0.166]. The 95% confidence intervals for AFC and ISE do not contain 0. This indicates that the conditional indirect effects of AFC and ISE between POS and CRE are significant regardless of whether the DT moderating variable takes low, median, or high values, and that the indirect effects of AFC and ISE increase with increasing levels of DT (0.083→0.131; 0.065→0.112). Chen & Wang[66] concluded that significant conditional indirect effects do not imply significant moderated mediation effects, so this study further used the PROCESS macro program to derive the INDEX judgment indicator. The INDEX judgment indicator for the moderating effect of DT on the indirect effect of POS on CRE through AFC and ISE was both 0.024 with 95% confidence intervals not including 0. (CI 0.007, 0.042] and [0.003, 0.046], respectively), indicating a significant moderated mediation effect. In addition, there are significant differences between the three mediating effects of AFC and ISE at different DT levels.

**Table 6** Moderated Mediation Effect Results

| Moderator | Level | CRE | | | | |
|---|---|---|---|---|---|---|
| | | Effect | SE | LL95% CI | UL95% CI | Significant |
| AFC | Low | 0.083 | 0.031 | 0.025 | 0.148 | yes |
| | Mean | 0.107 | 0.037 | 0.034 | 0.178 | yes |
| | High | 0.131 | 0.044 | 0.042 | 0.213 | yes |
| Contrast | Mean-Low | 0.024 | 0.009 | 0.007 | 0.043 | yes |
| | High-Low | 0.047 | 0.018 | 0.014 | 0.085 | yes |
| | High-Mean | 0.024 | 0.009 | 0.007 | 0.043 | yes |
| ISE | Low | 0.065 | 0.027 | 0.014 | 0.121 | yes |
| | Mean | 0.088 | 0.024 | 0.044 | 0.139 | yes |
| | High | 0.112 | 0.026 | 0.064 | 0.166 | yes |
| Contrast | Mean-Low | 0.024 | 0.011 | 0.004 | 0.047 | yes |
| | High-Low | 0.048 | 0.022 | 0.007 | 0.093 | yes |
| | High-Mean | 0.024 | 0.011 | 0.004 | 0.047 | yes |

**Note**: N = 380. Bootstrap sample size = 5000.
**Abbreviations**: LL, lower limit; CI, confidence interval; UL, upper limit.

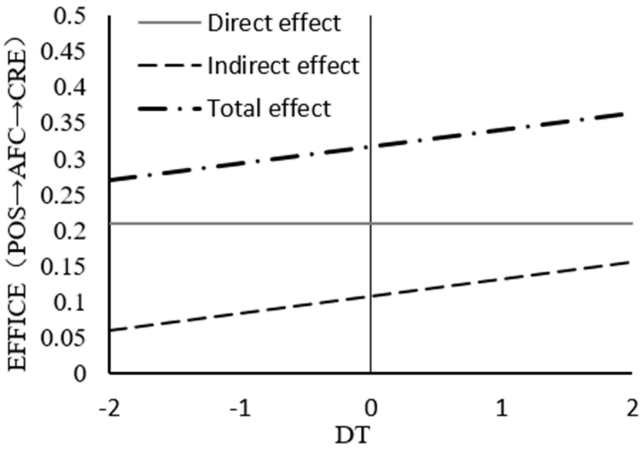


**Figure 6** Moderated mediation effect (AFC Path).

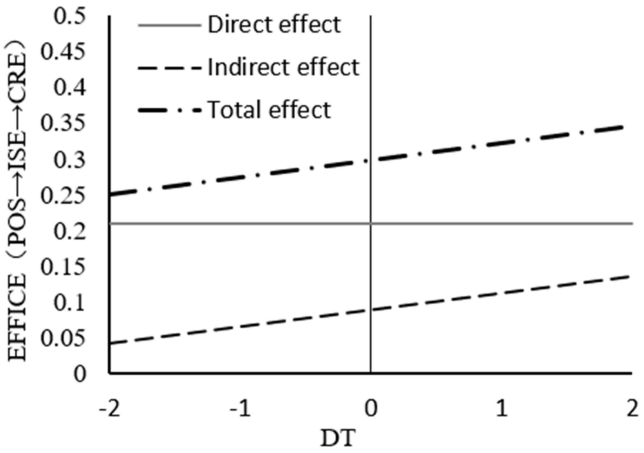


**Figure 7** Moderated mediation effect (ISE Path).

Considering that the moderating mediating effect is a linear function of the moderating variable, the indirect effects derived from the previous point selection method cannot fully reflect the full picture of the influence of the mediating variable by the moderating variable. Based on this, this study drew on Hayes[65] to calculate the direct, indirect, and total effects of POS on CRE through AFC and ISE at different values of DT, and the results are plotted in Figures 6 and 7. As can be seen from Figures 6 and 7, DT positively moderates the relationship between AFC, ISE on POS and CRE. At the same DT level, the moderating mediating effect of the AFC path is greater than that of ISE.

## Conclusion and Discussion

This study explored the formation mechanism of science-technology talents' creativity from the perspective of employee-organization relationships based on the realistic background of the digital era. Using resource conservation theory and social exchange theory, the study examined the influence of perceived organizational support on science-technology talents' creativity, the mediating effect of affective commitment and innovative self-efficacy on it, and the moderating effect of digital thinking between perceived organizational support and affective commitment and innovative self-efficacy. The results of the study show that perceived organizational support has a significant positive effect on the creativity of science-technology talents. Digital thinking positively moderates the relationship between perceived organizational support and affective commitment and innovative self-efficacy, and affective commitment and innovative self-efficacy play a moderated mediation role between perceived organizational support and the creativity of science-technology talents. Overall, this study has the following main theoretical contribution, management enlightenment, limitations and prospects.

## Theoretical Contribution

Firstly, this study deepens the research on the drivers and underlying mechanisms of individual-based creativity. From the perspective of the organization-employee relationship, this study finds that perceived organizational support helps individuals develop strong affective commitment[67] and innovative self-efficacy, which in turn promotes creativity. Since the formation of creativity not only requires individuals to be motivated to try, but also requires individuals to have the confidence and ability to break through, previous studies have mostly analyzed the factors influencing creativity at a single "willingness" level, such as calling[68] and work engagement.[16,17] This study further enriches the exploration of creativity influencing mechanisms by exploring the formation of creativity at both the "willingness" and "ability" levels.

Secondly, this study expands the boundary conditions of the relationship between perceived organizational support, affective commitment, innovative self-efficacy, and individual creativity. At present, the relationship between perceived organizational support and affective commitment is controversial.[8] Existing research ignores the theoretical interpretation of resource conservation theory on creativity formation and the exploration of individual creativity formation mechanisms in the digital environment. This study analyzes the important influence of resource conservation theory on the formation of individual creativity and introduces the "digital thinking" variable to examine its moderated mediation role between perceived organizational support and affective commitment, innovative self-efficacy, and individual creativity. This deepens our understanding of the process of individual creativity formation and shows that perceived organizational support not only has a direct impact on creativity, but also has an indirect effect on creativity through affective commitment and innovative self-efficacy. At the same time, individuals who are dialectical and creative thinkers are more likely to enhance their emotional connection with the organization, improve their creative confidence and effectiveness, and work creatively. This provides a more comprehensive understanding of the boundary conditions of the relationship between perceived organizational support, affective commitment, innovative self-efficacy, and individual creativity.

Finally, this study contributes to complementing and improving the theoretical system of creativity. The subjects of creativity in existing studies are mostly general employees. In contrast, science-technology talents have richer knowledge reserves and greater creativity potential, and they are the core force in achieving innovation in organizations. It is important to explore the relationship between the group of science-technology talents and creativity to further improve the theoretical system of creativity.

## Management Enlightenment

On the one hand, managers must recognize that, for the high human capital group of science-technology talents, they must not only focus on "hard" circumstances such as material and environmental support and assistance, but also boost "soft" motivation at the spiritual level. This means that managers should pay attention to science-technology talents when creating policies and allocating resources, so that science-technology talents may truly feel the organization's care and attention and understand that their effort will be appreciated. The organization should increase the material and spiritual incentives for science-technology talents, strengthen communication with this group, pay attention to their work and life needs, and give them sufficient psychological support[16] to enhance their emotional connection. At the same time, the organization needs to create an open and inclusive working atmosphere and tolerate "innovation failure."

On the other hand, with the advent of the digital era, organizations should accelerate digital transformation, formulate digital development plans, introduce and use digital technologies and digital devices, and guide science-technology talents to establish dialectical and innovative thinking, improve the digital literacy of this group, and their loyalty and recognition to the organization, so that they can efficiently engage in creative activities and promote the enhancement of sustainable performance of organizational innovation.

# Limitations and Prospects

This study also has the following limitations: First, although this study uses paired questionnaire data of science-technology talents and their supervisors, which avoids the problem of common method bias to a certain extent, it is still cross-sectional data. Future studies can collect longitudinal data on perceived organizational support, affective

commitment, innovative self-efficacy, and digital thinking based on different time points and select independent and outcome variables from different data sources in order to better examine the relationship between the variables.[65]

Second, this study explores the formation mechanism of creativity in science-technology talents at the level of individual perceived organizational support. However, team-level perceived organizational support may also have an impact on individual-organizational exchange relationships and creativity. So, future studies may consider including individual and team perceived organizational support in the same creativity research framework in organizational contexts to explore the impact of individual and team perceived organizational support on affective commitment and creativity mechanisms.

Third, when considering digital variables, this study selects digital thinking as a moderating variable. Future empirical studies may attempt to integrate digital elements such as digital knowledge and digital skills to better enrich theoretical research on creativity in the digital era.

## Ethics Statement and Informed Consent

The study protocol was approved by School of Business and Tourism Management, Yunnan University. The guidelines outlined in the Declaration of Helsinki were followed and written informed consent was obtained from all individual participants included in the study.

## Author Contributions

All authors made substantial contributions to research design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; agreed to submit to the current journal; provided final approval of the version to be published; and agree to be accountable for all aspects of the work.

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## Disclosure

Authors declare that they have no conflict of interest.

## References

1. Zhou J, George JM. When job dissatisfaction leads to creativity: encouraging the expression of voice. *Acad Manag J*. 2001;44(4):682–696. doi:10.2307/3069410
2. Yang YQ, Sun JP, Zhou XH. Research on the imperfection of creative work environment and its path——perspective on needs and preferences of the professional technicistss of China. *Sci Technol Prog Pol*. 2015;32(14):151–155.
3. Zhang L, Bu Q, Wee S. Effect of perceived organizational support on employee creativity: moderating role of job stressors. *Int J Stress Manag*. 2016;23(4):400–417. doi:10.1037/str0000025
4. Chen QQ, Fan Y, Xiao LC. A study on the impact of perceived organizational support on employee's innovation behavior——the role of goal orientation and power motive. *East China Econ Manage*. 2018;43–50. doi:10.19629/j.cnki.34-1014/f.170628007
5. Yu CX, Frenkel SJ. Explaining task performance and creativity from perceived organizational support theory: which mechanisms are more important? *J Organ Behav*. 2013;34(8):1165–1181. doi:10.1002/job.1844
6. Khazanchi S, Masterson SS. Who and what is fair matters: a multi-foci social exchange model of creativity. *J Organ Behav*. 2011;32(1):86–106. doi:10.1002/job.682
7. Lee J, Pecce R. Perceived organizational support and affective commitment: the mediating role of organization-based self-esteem in the context of job insecurity. *J Organ Behav*. 2007;28(6):661–685. doi:10.1002/job.431
8. Rhoades L, Eisenberger R. Perceived organizational support: a review of the literature. *J Appl Psychol*. 2002;87(4):698. doi:10.1037//0021-9010.87.4.698
9. Sluss DM, Klimchak M, Holmes JJ. Perceived organizational support as a mediator between relational exchange and organizational identification. *J Vocat Behav*. 2008;73(3):457–464. doi:10.1016/j.jvb.2008.09.001
10. Gu YD, Peng JS. The affect mechanism of creative self-efficacy on employees'creative behavior. *Sci Res Manag Rev*. 2011;63–73. doi:10.19571/j.cnki.1000-2995.2011.09.009
11. Gong Y, Huang J-C, Farh J-L. Employee learning orientation, transformational leadership, and employee creativity: the mediating role of employee creative self-efficacy. *Acad Manag J*. 2009;52(4):765–778. doi:10.5465/amj.2009.43670890
12. Tierney P, Farmer SM. Creative self-efficacy development and creative performance over time. *J Appl Psychol*. 2011;96(2):277–293. doi:10.1037/a0020952

13. Z-c LI, Y-h ZHU, X-j ZHAN. Creativity and workplace incivility: from the perspective of ego depletion theory. *Contemp Fin Econ*. 2019;72–81. doi:10.13676/j.cnki.cn36-1030/f.2019.09.008
14. Chua RYJ, Lim JH, Wiruchnipawan W, Papousek I. Unlocking the creativity potential of dialectical thinking: field investigations of the comparative effects of transformational and transactional leadership styles. *J Creat Behav*. 2021;55:710–722. doi:10.1002/jocb.528
15. Guo MJ, Zhang M, Li XR. Steal like an artist: connection between critical thinking and creativity of a future musician in a digital environment. *Think Skills Creat*. 2021;42100952. doi:10.1016/j.tsc.2021.100952
16. Inam A, Ho JA, Zafar H, Khan U, Sheikh AA, Najam U. Fostering creativity and work engagement through perceived organizational support: the interactive role of stressors. *Sage Open*. 2021;11(3):1–16. doi:10.1177/21582440211046937
17. Aldabbas H, Pinnington A, Lahrech A. The influence of perceived organizational support on employee creativity: the mediating role of work engagement. *Curr Psychol*. 2021. doi:10.1007/s12144-021-01992-1
18. Amabile TM, Pratt MG. The dynamic componential model of creativity and innovation in organizations: making progress, making meaning. In: Brief AP, Staw BM, editors. *Research in Organizational Behavior: An Annual Series of Analytical Essays and Critical Reviews*. Vol. 36. 2016:157–183.
19. Kurtessis JN, Eisenberger R, Ford MT, Buffardi LC, Stewart KA, Adis CS. Perceived organizational support: a meta-analytic evaluation of organizational support theory. *J Manage*. 2017;43(6):1854–1884. doi:10.1177/0149206315575554
20. Mumford MD, Scott GM, Gaddis B, Strange JM. Leading creative people: orchestrating expertise and relationships. *Leadersh Q*. 2002;13 (6):705–750. doi:10.1016/s1048-9843(02)00158-3
21. Luthans F, Youssef CM, Avolio BJ. *Psychological Capital: Developing the Human Competitive Edge*. Vol. 198. Oxford university press Oxford; 2007.
22. El-Kassar AN, Dagher GK, Lythreatis S, Azakir M. Antecedents and consequences of knowledge hiding: the roles of HR practices, organizational support for creativity, creativity, innovative work behavior, and task performance. *J Bus Res*. 2022;140:1–10. doi:10.1016/j.jbusres.2021.11.079
23. Lee S, Han S, Byun G, Son SY. Social exchange relationships and exchange ideologies of employees and supervisors: a three-way interaction toward employee creativity. *Appl Psychol*. 2022;71(2):539–563. doi:10.1111/apps.12338
24. Liu D, Jiang K, Shalley CE, Keem S, Zhou J. Motivational mechanisms of employee creativity: a meta-analytic examination and theoretical extension of the creativity literature. *Organ Behav Hum Decis Process*. 2016;137:236–263. doi:10.1016/j.obhdp.2016.08.001
25. Wang Y, Zhang L. How psychological resilience influence employees' creativity: the role of psychological safety and creative self-efficacy. *J Psychol Sci*. 2018;41(1):118–124. doi:10.16719/j.cnki.1671-6981.20180118
26. Zhan XH, Yang DT, Luan ZZ, An YR, Business SO, University N. The relationship between proactive personality and employee creativity——the mediation effect of work engagement and personal learning. *Soft Sci*. 2018;82–85. doi:10.13956/j.ss.1001-8409.2018.04.18
27. Lu JH, Chen LL, Zhan XN. Relationship study on perceived organizational support organizational commitment support and engagement of knowledge employees. *Int Jj Adv Sci Res Manag*. 2013;34(1):147–153.
28. Anderson N, Potocnik K, Zhou J. Innovation and creativity in organizations: a state-of-the-science review, prospective commentary, and guiding framework. *J Manage*. 2014;40(5):1297–1333. doi:10.1177/0149206314527128
29. Shalley CE, Gilson LL, Blum TC. Interactive effects of growth need strength, work context, and job complexity on self-reported creative performance. *Acad Manag J*. 2009;52(3):489–505. doi:10.5465/amj.2009.41330806
30. Meyer JP, Allen NJ. A three-component conceptualization of organizational commitment. *Hum Resour Manag Rev*. 1991;1(1):61–89. doi:10.1016/1053-4822(91)90011-Z
31. Chen Y, Ferris DL, Kwan HK, Yan M, Zhou M, Hong Y. Self-love's lost labor: a self-enhancement model of workplace incivility. *Acad Manag J*. 2013;56(4):1199–1219. doi:10.5465/amj.2010.0906
32. Choi WS, Kang SW, Choi SB. Innovative behavior in the workplace: an empirical study of moderated mediation model of self-efficacy, perceived organizational support, and leader-member exchange. *Behav Sci*. 2021;11(12). doi:10.3390/bs11120182
33. Islam T, Khan MM, Khawaja FN, Ahmad Z. Nurses' reciprocation of perceived organizational support: the moderating role of psychological contract breach. *Int J Hum Rights Healthc*. 2017;10(2):123–131. doi:10.1108/ijhrh-12-2016-0023
34. De Stobbeleir KEM, Ashford SJ, Buyens D. Self-regulation of creativity at work: the role of feedback-seeking behavior in creative performance. *Acad Manag J*. 2011;54(4):811–831. doi:10.5465/amj.2011.64870144
35. Chaudhary A, Islam T, Ali HF, Jamil S. Can paternalistic leaders enhance knowledge sharing? The roles of organizational commitment and Islamic work ethics. *Glob Knowl Mem Com*. 2021. doi:10.1108/gkmc-06-2021-0109
36. Riketta M. Attitudinal organizational commitment and job performance: a meta-analysis. *J Organ Behav*. 2002;23(3):257–266. doi:10.1002/job.141
37. Meyer JP, Maltin ER. Employee commitment and well-being: a critical review, theoretical framework and research agenda. *J Vocat Behav*. 2010;77 (2):323–337. doi:10.1016/j.jvb.2010.04.007
38. Morin AJS, Vandenberghe C, Turmel M-J, Madore I, Maiano C. Probing into commitment's nonlinear relationships to work outcomes. *J Manag Psychol*. 2013;28(1–2):202–223. doi:10.1108/02683941311300739
39. Gupta V, Agarwal UA, Khatri N. The relationships between perceived organizational support, affective commitment, psychological contract breach, organizational citizenship behaviour and work engagement. *J Adv Nurs*. 2016;72(11):2806–2817. doi:10.1111/jan.13043
40. Shantz A, Alfes K, Atham GPL. The buffering effect of perceived organizational support on the relationship between work engagement and behavioral outcomes. *Hum Resour Manage*. 2016;55(1):25–38. doi:10.1002/hrm.21653
41. Tyler TR, Blader SL. The group engagement model: procedural justice, social identity, and cooperative behavior. *Pers Soc Psychol Rev*. 2003;7 (4):349–361. doi:10.1207/s15327957pspr0704_07
42. Hakimian F, Farid H, Ismail MN, Nair PK. Importance of commitment in encouraging employees' innovative behaviour. *Asia-Pac J Bus Adm*. 2016;8(1):70–83. doi:10.1108/APJBA-06-2015-0054
43. Colla E, Ruiz-Molina ME, De Gery CC, Schultz M, Deparis M, Lemmet L. Understanding franchisee performance The role of the franchisee's autonomy, affective commitment to the network and innovativeness. *Int J Retail Distrib Manage*. 2019;47(7):733–751. doi:10.1108/ijrdm-10-2017-0232
44. Jatmiko B, Laras T, Rohmawati A. Budgetary participation, organizational commitment, and performance of Local Government Apparatuses. *J Asian Finance Econ Bus*. 2020;7(7):379–390. doi:10.13106/jafeb.2020.vol7.no7.379

45. Jauhari H, Singh S, Kumar M. How does transformational leadership influence proactive customer service behavior of frontline service employees? Examining the mediating roles of psychological empowerment and affective commitment. *J Enterp Inf Manag*. 2017;30(1):30–48. doi:10.1108/JEIM-01-2016-0003
46. Vuong BN, Tung DD, Hoa ND, Chau NTN, Tushar H. An Empirical Assessment of Organizational Commitment and Job Performance: vietnam small and medium-sized enterprises. *J Asian Finance Econ Bus*. 2020;7(6):277–286. doi:10.13106/jafeb.2020.vol7.no6.277
47. Ribeiro N, Duarte AP, Filipe R, de Oliveira RT. How authentic leadership promotes individual creativity: the mediating role of affective commitment. *J Leadersh Organ*. 2020;27(2):189–202. doi:10.1177/1548051819842796
48. Beghetto RA. Creative self-efficacy: correlates in middle and secondary students. *Creat Res J*. 2006;18(4):447–457. doi:10.1207/s15326934crj1804_4
49. Tierney P, Farmer SM. Creative self-efficacy: its potential antecedents and relationship to creative performance. *Acad Manag J*. 2002;45(6):1137–1148. doi:10.2307/3069429
50. Liao H, Liu D, Loi R. Looking at both sides of the social exchange coin: a social cognitive perspective on the joint effects of relationship quality and differentiation on creativity. *Acad Manag J*. 2010;53(5):1090–1109. doi:10.5465/amj.2010.54533207
51. Islam T, Ahmed I. Mechanism between perceived organizational support and transfer of training. *Manag Res Rev*. 2018;41(3):296–313. doi:10.1108/mrr-02-2017-0052
52. Maan AT, Abid G, Butt TH, Ashfaq F, Ahmed S. Perceived organizational support and job satisfaction: a moderated mediation model of proactive personality and psychological empowerment. *Futures Mark J*. 2020;6:21. doi:10.1186/s43093-020-00027-8
53. Ahmed I, Nawaz MM, Ali G, Islam T. Perceived organizational support and its outcomes. *Manag Res Rev*. 2015;38(6):627–639. doi:10.1108/mrr-09-2013-0220
54. Ashford SJ, Blatt R, VandeWalle D. Reflections on the looking glass: a review of research on feedback-seeking behavior in organizations. *J Manage*. 2003;29(6):773–799. doi:10.1016/s0149-2063(03)00079-5
55. Liu Z, Zheng Q. Uncertainty avoidance and Employee Innovation Behavior: the mediating role of self-efficacy. *Sci Technol Soc*. 2016;33(4):149–155.
56. Gong Y, Kim T-Y, Lee D-R, Zhu J. A multilevel model of team goal orientation, information exchange, and creativity. *Acad Manag J*. 2013;56(3):827–851. doi:10.5465/amj.2011.0177
57. Mathisen GE, Bronnick KS. Creative self-efficacy: an intervention study. *Int J Educ Res*. 2009;48(1):21–29. doi:10.1016/j.ijer.2009.02.009
58. Maria AD, Yulianto H, Palupiningtyas D, Usodo H. Relationship between transformational leadership, proactive personality, creative self-efficacy and employee creativity at food processing SMEs in Indonesia. *Evid-Based HRM*. 2022;10(3):257–274. doi:10.1108/ebhrm-03-2021-0033
59. Lu CQ, Ling WQ, Fang L. Effects of managerial self-efficacy on managers' work-related attitudes and performances: an Exploratory Study in China. *Acta Sci Nat Univ Pekin*. 2006;42(2):276–280. doi:10.13209/j.0479-8023.2006.052
60. Harun MFB, Yunhendri RB, Shaharudin MHB, Kanapathipillai K. The impact of self-efficacy and creative process engagement on innovative work behaviour in the Telecommunication Industry in Malaysia. *Eur J Manag Bus Econ*. 2022;6(2). doi:10.46827/ejefr.v6i2.1273
61. Laar E, Deursen AJ, Dijk JA, Haan JD. Determinants of 21st-century skills and 21st-century digital skills for workers: a systematic literature review. *Sage Open*. 2020;10(1):1–14. doi:10.1177/2158244019900176
62. Lambert SJ. Added benefits: the link between work-life benefits and organizational citizenship behavior. *Acad Manag J*. 2000;43(5):801–815. doi:10.2307/1556411
63. Tsui AS, Pearce JL, Porter LW, Tripoli AM. Alternative approaches to the employee-organization relationship: does investment in employees pay off? *Acad Manag J*. 1997;40(5):1089–1121. doi:10.2307/256928
64. Yun Z-L, Huang BB, Tang DD. Preliminary work for modeling questionnaire data. *J Psychol Sci*. 2018;(1):204. doi:10.16719/j.cnki.1671-6981.20180130
65. Hayes AF. *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*. Guilford publications; 2017.
66. Chen D, Wang Z. The effects of role overload on employee outcomes under organizational change: a moderated mediation model. *J Zhejiang Univ*. 2015;45:143–157.
67. Islam T, Ahmed I, Ahmad UN. The influence of organizational learning culture and perceived organizational support on employees' affective commitment and turnover intention. *Nankai Bus Rev Int*. 2015;6(4):417–431. doi:10.1108/nbri-01-2015-0002
68. Duan WJ, Tang XQ, Li YM, Cheng XF, Zhang H. Perceived organizational support and employee creativity: the mediation role of calling. *Creat Res J*. 2020;32(4):403–411. doi:10.1080/10400419.2020.1821563