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ORIGINAL RESEARCH

Spiritual Leadership, Autonomous Motivation and Employee Craftsmanship Spirit: The Cross-Level Moderating Effect of Caring Ethical Climate

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Purpose: Whether in traditional manufacturing or modern intelligent manufacturing, craftsmen have always been the backbone of China's manufacturing industry. Cultivating employee craftsmanship spirit has become one of the top tasks of human resource management in China's manufacturing industry. The question is what kind of leadership style will promote employee craftsmanship spirit and how can it be promoted? To answer this question, based on self-determination theory and social exchange theory, this study focuses on the influence of spiritual leadership on employee craftsmanship spirit, as well as the moderating effect of having a caring ethical climate and the mediating effect of autonomous motivation between spiritual leadership and employee craftsmanship spirit.
Methods: The leaders and employees of 103 work teams from Chinese manufacturing enterprises were investigated, and 434 paired data points were obtained. Data analysis and hypothesis testing were conducted using data analysis software, such as HLM, SPSS, and AMOS.
Results: The results reveal that spiritual leadership can significantly positively predict employee craftsmanship spirit. Employee autonomous motivation plays a partial mediating role in the positive correlation between spiritual leadership and craftsmanship spirit. Additionally, caring ethical climate positively moderates the correlation between spiritual leadership and the autonomous motivation of employees. The greater the caring ethical climate of teams is, the stronger the positive correlation between spiritual leadership and the autonomous motivation of employees.
Conclusion: Leadership plays an important role in the process of employees improving their skills, acquiring the status of craftsmen, and developing craftsmanship beliefs. Therefore, it is of great significance to understand how spiritual leadership style can effectively promote craftsmanship spirit among employees for high-quality development of the manufacturing industry. This study reveals the ways that spiritual leadership influences employee craftsmanship spirit from a new perspective and confirms the mediating effect of autonomous motivation as well as the moderating effect of caring ethical climate. The research conclusions can provide practical solutions for cultivating employee craftsmanship spirit.
Keywords: spiritual leadership, employee craftsmanship spirit, autonomous motivation, caring ethical climate, manufacturing industry

Introduction

As a key factor in the prosperous handicraft industry in ancient China, "craftsmanship spirit" was an important aspect of high-level artisanship and is a source of motivation for creating high-quality products in today's manufacturing industry. In fact, in the modern development process, craftsmanship spirit was once neglected in the context of the pursuit of high-speed development. In recent years, China's economic development has entered a new normal, and high-quality development has become an important issue in this new era. Since premier Li Keqiang first introduced the "craftsmanship spirit" in his government work report in 2016, this term has appeared many times in government reports and important speeches made by the leaders of the Communist Party of China and the state, sparking widespread discussion in society. Promoting the craftsmanship spirit is both a need of the times and a need for social development. The call for

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cultivating the craftsmanship spirit is becoming increasingly stronger among Chinese enterprises and academics. Therefore, the issue of how to enhance the craftsmanship spirit of manufacturing employees needs urgent attention and in-depth discussion. Existing studies have explored the conceptual connotation, contemporary value, and cultivation path of craftsmanship, and some valuable research results have been achieved. However, most studies argue the importance of craftsmanship spirit, and there lacks empirical research on the cultivation mechanism based on the microscopic perspective, which results in ignoring the influence mechanism of micro factors on craftsmanship spirit, such as leadership, organizational climate, employees' psychological needs, and value orientation.

The employee is the microcarrier and ultimate source of craftsmanship spirit,[1] which describes a positive work state and behavior involving excellence, dedication, cooperation, focused engagement, and innovation.[2,3] Numerous empirical studies have proven that the formation of employees' attitudes and behaviors such as these depend on the influence of different leadership styles.[4–7] In fact, enterprise managers are the most direct and effective cultivators of craftsmanship spirit, and studies have also found that different leadership styles and behaviors can have a significant impact on employee craftsmanship spirit.[1,8] A few empirical studies have established the relationship between paternalistic leadership or self-sacrificial leadership and employees' craftsmanship spirit.[1,9] As the key cultivator of employee craftsmanship spirit, leaders are a pivotal part of employee skill enhancement, craftsmanship identity acquisition, and craftsmanship belief formation. Thus, identifying which leadership style and what process can effectively promote employee craftsmanship spirit calls for richer theoretical and empirical exploration.

Most leadership theories explore the complex interactions between leaders and employees at the psychological, emotional, or behavioral levels,[10,11] but not enough attention is given to the interaction between leaders and their subordinates at the spiritual level, which has been remedied by the introduction of spiritual leadership. Unlike inclusive leadership and self-sacrificial leadership, spiritual leadership advocates that leaders satisfy the spiritual needs of employees for excellence, self-actualization, and appreciation by building a great organizational vision, believing in the vision, and showing altruistic love to employees to motivate them to achieve positive results that benefit individuals, groups, organizations, and even society.[12,13] Established studies have found that spiritual leadership has a positive impact on employees' work attitudes, work engagement, and innovation performance,[14,15] and its outcomes in employees' work perceptions and behavioral attitudes are associated with what craftsmanship spirit entails. In fact, spiritual leadership, which is being a "spiritual leader" in the minds of subordinates by building a grand vision, emphasizing altruistic love, and fostering positive beliefs, is naturally associated with the emergence and development of employee craftsmanship spirit, ie, spiritual leadership may be an effective leadership style for fostering employee craftsmanship spirit. However, there are few studies linking the spiritual beliefs of leaders to the cultivation of employee craftsmanship spirit. Therefore, the question of whether spiritual leadership can have an impact on employee craftsmanship spirit and the mechanism of that impact remains to be investigated.

As far as spiritual leadership's influence on employees is concerned, individual employees' psychological cognitive processes may play a crucial role in bridging the gap, and self-determination theory provides a new perspective for interpreting how organizational leadership influences employee attitude formation and behavior occurrence. The theory states that individual autonomous motivation is vulnerable to external contextual factors.[16] As one of the important contextual factors at work, the close attention of spiritual leaders to employees' spiritual needs will largely influence the extent to which employees pay attention to and actively seek to satisfy their psychological needs, thus affecting their autonomous motivation,[17] which in turn has an important impact on individual behavior and attitudes.[18] Therefore, this study argues that autonomous motivation better explains the mechanisms underlying the influence of spiritual leadership on employee craftsmanship spirit. In addition to leadership factors, a good organizational climate also contributes to the formation of autonomous motivation.[19] It has been thoroughly highlighted in the literature that an organization's ethical climate has a substantial impact on the work perceptions, attitudes, and behaviors of its employees.[20–22] Employees apply ethical climate as a point of view to frame their daily decision-making processes.[23] The ethical climate is the prevailing perception of typical organizational practices and procedures that have ethical content.[24] As a specific type of ethical climate, a caring ethical climate has characteristics that coincide with spiritual leadership. It emphasizes that members of the organization consider the interests of others and use altruism as a basic guideline for identifying and resolving ethical issues.[25] When in a caring ethical climate, members of the organization care about each other and are more concerned

about the interests of others and the organization than their own interests.[26] According to leadership substitution theory, the effectiveness of leadership behavior is enhanced when the organization can provide support factors that are consistent with leadership behavior.[27] To more comprehensively explore the paths and boundary conditions of the influence of spiritual leadership on employee craftsmanship spirit, following the view of leadership substitution theory, this study suggests that a caring ethical climate can serve as an "enhancer" of spiritual leadership, strengthening the role of spiritual leadership on employees' autonomous motivation and craftsmanship spirit. Therefore, this variable is introduced as a moderating variable into the theoretical model.

In summary, based on the policy context and social reality of China, this study explores the specific mechanism of spiritual leadership on employee craftsmanship from the perspective of "spiritual driving force" which helps develop empirical research on employee craftsmanship spirit. The research findings provide effective suggestions to address the current low overall quality of China's manufacturing workforce and improve the current situation of a large but weak manufacturing industry, as well as provide novel ideas for global manufacturing companies to build core competitiveness and promote enterprise development by cultivating the craftsmanship spirit of their employees. The complete theoretical model for this study is shown in Figure 1.

Literature Review and Hypothesis Development
Spiritual Leadership and Employee Craftsmanship Spirit

While most traditional leadership theories are constructed from an individual's needs for survival and security,[10] spiritual leadership emphasizes higher-level spiritual needs such as respect and a sense of meaning, and this leadership style offers a new perspective for solving some of the higher-level problems in current organizations.[13] Spiritual leadership has a subtle impact on organizational development and personal growth because of its core principle of motivating employees to work hard from the inside out, and numerous domestic and international studies have confirmed that spiritual leadership has a significant positive impact on employees' well-being, task performance, knowledge sharing behavior, innovation behavior, intrapreneurial behaviors, organizational citizenship behavior, etc.[28–32]

Scholars have explored the influencing factors and driving mechanisms of craftsmanship spirit in employees from multiple perspectives. Most focus on institutions and culture, production models, and institutional education from a macro perspective, while a few studies explore the role of leadership and personal factors in influencing craftsmanship spirit from a micro perspective.[33] Among them, a small number of studies point out that employee craftsmanship spirit is highly susceptible to the influence of leadership style.[27] Given that the findings of existing studies confirm that a positive leadership style may be significantly effective in fostering craftsmanship spirit, this study hypothesizes that, based on the theory of intrinsic motivation, employees need to be reasonably motivated by their leaders to perform benign behaviors that benefit the organization. Perceived supervisory support plays a critical role in giving organizational resources and motivation to subordinates and should be considered an important source of support.[34] Craftsmanship spirit requires employees to continuously invest a significant amount of time and energy in their work and exhibit some self-sacrificing behaviors, so it is more important to satisfy employees' spiritual needs in the organization through intrinsic motivation to give them a sense of mission and belonging and to internalize organizational goals into personal goals. Spiritual
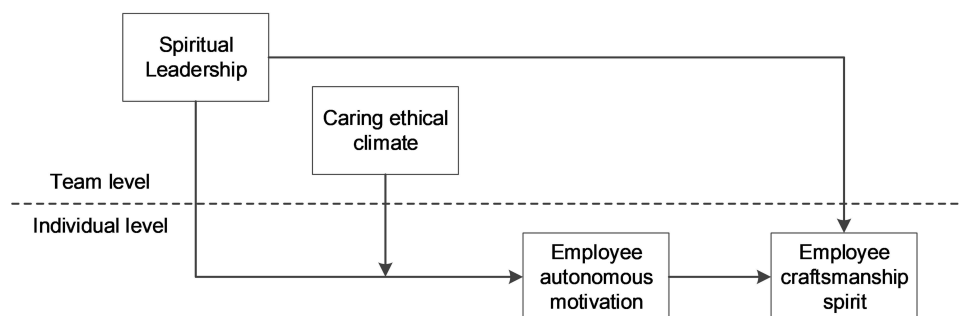
Figure 1 Theoretical Model from Spiritual Leadership to Employee Craftsmanship Spirit.

leadership generates a strong intrinsic motivation, which will positively impact employees' self-valuation and thus foster their craftsmanship spirit.[13] In line with the abovementioned theoretical arguments and empirical findings, we propose the following hypothesis:

H1: Spiritual leadership is positively related to employee craftsmanship spirit.

Spiritual Leadership and Autonomous Motivation

Autonomous motivation describes an individual's motivation to engage in a behavior according to his or her own will and free choice (eg, interests, beliefs).[35] Leader behaviors are directly related to autonomous motivation,[36] and some leadership styles have been shown to have a significant impact on employees' autonomous motivation, such as transformational leadership,[37] servant leadership,[38] and empowering leadership.[39] The more support leaders give to their subordinates, the more subordinates feel that their psychological needs are satisfied,[40] resulting in higher autonomous motivation and performance. Regarding spiritual leadership, Shi et al suggested that autonomous motivation plays an important mediating role in the influence of spiritual leadership on employees' occupational calling.[41] Zhang and Yang argued that spiritual leadership was positively related to employee innovative behavior via autonomous motivation.[42]

According to self-determination theory, autonomous motivation develops when employees' needs for autonomy, competency, and relationships are met.[36] Spiritual leadership emphasizes common vision, hope, belief, and altruistic love, which can create positive expectations and feelings of being understood and appreciated, thus effectively satisfying employees' psychological needs and triggering the generation of their autonomous motivation.[18] First, satisfying the need for autonomy comes from the perception of psychological freedom in the process of completing work tasks and the perception of autonomous satisfaction in the process of interacting with the leader.[43] Spiritual leadership emphasizes building a good vision for employees that harmonizes personal interests with organizational benefits and focuses on caring for employees and their spirituality, which makes them feel less stress and more positive work meaning, resulting in a higher degree of psychological freedom and satisfaction in interactions.[30] Thus, it can effectively meet employees' psychological needs for work autonomy. Second, spiritual leaders pay attention to information feedback when interacting with employees and strive to meet their real needs, care about their career development, and facilitate meeting their competency needs by providing development opportunities and enhancing psychological resources.[44] Finally, spiritual leadership appreciates the achievements of employees, actively conveys the belief that they can achieve higher goals, and fully conveys the respect and trust of the organization.[45] The interpersonal needs of employees are better met through appreciation from close relationships with leaders. Given that spiritual leadership helps satisfy the basic psychological needs of employees, such as autonomy, competence, and interpersonal relationships, which in turn can promote individual autonomous motivation,[46] this study proposes the following hypothesis.

H2: Spiritual leadership is positively related to employee autonomous motivation.

The Mediating Role of Autonomous Motivation

The basic assumption of self-determination theory is to view human beings as active organisms with the potential for self-integration and development, which must be stimulated and facilitated by the environment.[36] The relationship between human beings and their environment is discursive; although human beings are not determined by their environment, they are constrained and influenced by it. Only when the environment satisfies the basic psychological needs of a person will all kinds of human potential be stimulated and realized.[47] Thus, it is believed that spiritual leadership influences the development of craftsmanship spirit through a psychological transformation, and autonomous motivation is likely to be an important aspect of this transformation. It has been found that autonomous motivation positively predicts employee attitudes, positive work behaviors, and psychological well-being, such as work effort,[48] work engagement,[49] organizational commitment,[50] and creativity.[51]

Given the high degree of congruence between the outcome variable of autonomous motivation and the connotations of the craftsmanship spirit, this study hypothesized that employee autonomous motivation significantly and positively predicted their level of craftsmanship spirit. Specifically, work is a major source of identity development for employees,[52] and individuals with higher motivations for autonomy at work tend to have a higher degree of job identity

and internal motivation,[53] which leads to a better sense of the meaning of work, concern for the development of their organization and team, and great enthusiasm for their work. As a result, employees are more committed to their work,[54] show a more fervent pursuit of work, and demonstrate a state of work that surpasses others,[55] such as increased creativity, ie, generating a higher level of craftsmanship spirit. In summary, considering the possible positive effects of spiritual leadership on employees' autonomous motivation, this study hypothesizes that autonomous motivation can effectively convey the positive effects of spiritual leadership on employee craftsmanship spirit. Thus, we hypothesize the following:

H3: Employee autonomous motivation mediates the positive relationships between spiritual leadership and employee craftsmanship spirit.

The Moderating Effects of Caring Ethical Climate

Leadership substitution theory suggests that the effectiveness of leadership behaviors is susceptible to influence from organizational-level factors and that the validity of leadership actions is diminished or reinforced by these influences.[56] Spiritual leadership in a caring ethical climate makes it easier for employees to identify with the leader's viewpoint and to be intrinsically motivated to work toward the organization's goals, thus creating the incentive to work in the direction desired by the leader. When employees are in an extremely caring ethical atmosphere, spiritual leaders meet their spiritual needs, give meaning to their work, and motivate them through vision, hope, belief, and altruistic love,[12] thus stimulating employee autonomous motivation at work to a greater extent.[42] In addition, social exchange theory suggests that the content of the exchange between employees and organizations includes both the exchange of material rewards and the exchange of psychological rewards.[28] When the relationship between employees and organizations is established in a significantly caring ethical atmosphere, the conditions for achieving the exchange of psychological rewards are met, ie, the organization's care for employees comes in exchange for their dedication to the organization.[57] In contrast, if employees do not feel support and good treatment from the organization at work, it results in demotivation and dissatisfaction, and the employees engage in nonworking activities.[58] Therefore, this study hypothesized that when employees are on a team with a particularly caring ethical climate, they will develop a sense of responsibility and obligation to want to give back to the organization, thus showing positive and enthusiastic work status at work,[59] internalizing the organization's goals as their own work goals and responsibilities, and showing a higher level of motivation to work and achieve.[60] Thus, we hypothesize the following:

H4: A caring ethical climate strengthens the positive relationship between spiritual leadership and autonomous motivation.

Methods
Sample and Data Collection

In selecting the survey sample, we can only try to ensure the representativeness of the sample data by increasing the diversity of the regions where the surveyed enterprises are located and the diversity of the nature of the surveyed enterprises, as we cannot ignore the issue of data availability. Through the social resources of our research team, we contacted HR managers of dozens of manufacturing companies in Jiangsu Province, Guangxi Province, Chongqing Province, and Shanghai, China. The survey was conducted twice.

First, we designed an electronic questionnaire using the Questionnaire Star (https://www.wjx.cn/), a well-known and widely used large-scale questionnaire distribution platform in China. This questionnaire included only demographic information of the participants and self-assessment questions on craftsmanship spirit and required participants to fill it out completely anonymously. Then, we sent the link of the electronic questionnaire to the HR managers we contacted in advance and asked them to forward the questionnaire to their employees for filling out. From August to September 2019, a total of 579 questionnaires were randomly distributed to employees of manufacturing enterprises through Questionnaire Star, and 548 questionnaires were collected. After eliminating invalid questionnaires, 498 valid questionnaires were obtained, with a valid questionnaire recovery rate of 90.88%, and these research data were used for the test of the craftsmanship spirit scale.

Second, an offline investigation was conducted from October to November 2019. Two sets of questionnaires were designed for this investigation: 1) the employee questionnaire consisted of employees' evaluation of spiritual leadership and self-assessment of their autonomous motivation and craftsmanship spirit, and 2) the leader questionnaire consisted of leaders' evaluations of the caring ethical climate of the work team. We asked the HR manager that we contacted in advance about the size of the work team participating in the survey so that we could prepare a leadership questionnaire and a corresponding number of employee questionnaires in sealable envelopes that respondents could seal themselves immediately after completing the survey to avoid dishonestly filling out the questionnaire for fear of information leakage. Due to transportation difficulties, we were unable to visit the participating manufacturing companies to distribute the questionnaires. Therefore, we trained the HR managers we contacted and explained to them in detail the rules for distributing the questionnaires and then mailed them the questionnaires and asked them to help distribute and collect the questionnaires. A total of 514 employee questionnaires and 124 leader questionnaires were distributed, and the final paired data from 103 work teams were obtained, of which 103 were valid questionnaires from leaders (valid return rate of 83.1%) and 434 were valid questionnaires for employees (valid return rate of 84.4%). Among the 103 sample work teams, the average number of people per team was 4.214, and the number of work teams belonging to state-owned enterprises was 37, accounting for 35.9%, the largest percentage. The distribution of team leaders and members for each indicator is good and basically meets expectations.

Development of the Employee Craftsmanship Spirit Scale

At present, there are abundant studies on the division of the dimensions of craftsmanship spirit, and most scholars conclude that craftsmanship spirit should include good working qualities such as love for work, dedication, excellence, and innovation.[2,3,8] However, few scholars have systematically elaborated the profound connotation of each dimension and the theoretical logic among the dimensions. As a result, the basic connotation of craftsmanship spirit is rather vague, which tends to restrict the in-depth development of relevant research. In defining the concept of artisan and traditional artisan, Professor Yu clarified that the so-called "manufacturing industry" is roughly divided into two stages of development: 1) traditional manual production and 2) modern machine production.[61] Traditional artisans have basic characteristics, such as manual work, inherited hereditary systems, and apprenticeship, as well as a highly artistic and ethical orientation to technical evaluation.[61] The artisans were the subjects of creative activities, their status was hereditary, and their occupation was fixed, which made it easy to form strong internal constraints. The system of "artisanship" brings about external legal constraints, and the dual role of ethics and law, coupled with the pursuit of raising the artistic level of the works, makes the connotation of traditional artisanship mainly embody the three aspects of excellence, love of work, and continuous concentration. From the modern point of view, with the revolution brought by machine-based mass production to the manufacturing industry, modern craftsmen are facing a paradigm shift from manipulable technology to conceptual technology. Artisans have also been given new responsibilities to promote technological development, which has largely stimulated the demand for innovation in manufacturing. The division of roles between workers and engineers among modern artisans also places higher demands on their ability to work in teams. Based on the above analysis, this study concludes that craftsmanship spirit should include five core elements: 1) excellence, 2) dedication, 3) continuous concentration, 4) courageous innovation, and 5) teamwork. On this basis, the five-dimensional structure of craftsmanship spirit is examined, and subsequent theoretical and empirical analyses are carried out.

Based on the above theoretical analysis, first, we referred to the literature on the dimensional measurement scale of craftsmanship spirit, and after fully listening to the opinions and ideas of experts in related fields and front-line manufacturing employees, we formed an initial version of the measurement questions of craftsmanship spirit. Then, experts in related fields were invited to qualitatively analyze the specific entries, and after several rounds of revision and improvement, a more mature questionnaire was finally formed. This questionnaire contained two parts: the first part consisted of basic personal information, and the second part was the craftsmanship spirit measurement scale. As shown in Table 1, there are 25 items in the craftsmanship scale, including six items on the dimension of excellence, five items on the dimension of dedication, four items on the dimension of continuous concentration, five items on the dimension of courageous innovation, and five items on the dimension of teamwork.

Table 1 The Items of Employee Craftsmanship Spirit Scale

Classification	Dimension	Number	Item
Traditional characteristics	Excellence	X1	I have extremely high goals in my work
		X2	Being organized and systematic is very important to me
		X3	I can accept a higher standard of work than others
		X4	I am highly detail-oriented in my work and strive for perfection
		X5	I have high expectations of my work
		X6	I want things to be perfect
	Dedication	X7	I put myself fully into the work
		X8	I am proud of the work I do
		X9	I am willing to invest energy in my work
		X10	I feel energetic in my work
		X11	I am passionate about my work
	Continuous concentration	X12	When I work, I forget everything around me
		X13	When I work, I feel like time flies by so quickly
		X14	When I work, I reach a state of ecstasy
		X15	At work, I will give my heart and soul
Modern characteristics	Courageous innovation	X16	I often have creative ideas
		X17	I take the initiative to suggest new ways to achieve work objectives
		X18	I actively seek to apply new technologies, processes or methods in my work
		X19	I regularly explore new ideas or solutions
		X20	I actively develop plans or programmes to implement innovative ideas
	Teamwork	X21	I always try to help and support my colleagues in any way I can
		X22	I often speak actively in team work discussions
		X23	I will take the initiative to care for other team members
		X24	I am willing to find ways to improve the overall performance of the team
		X25	I will take the initiative to help colleagues to complete their work

In the first step, 249 data points were randomly selected from 498 sample data points, and exploratory factor analysis was conducted on them, which showed a Bartlett value of 3,084.894 (p<0.001) and a KMO value of 0.880. Then, using the principal component method and the maximum variance method, five factors were extracted, Items X6, X7, and X22 were deleted, and 22 items were retained according to the magnitude of the factor loadings. The final exploratory factor analysis result is shown in Table 2. In the second step, the remaining 249 data points were used for confirmatory factor analysis. The results of the first-order confirmatory factor analysis were good, and the fit indices in the second-order structural model reached the ideal level, indicating that the five dimensions could converge accurately on the high-level construct of craftsmanship spirit. The results of the second-order confirmatory factor analysis are shown in Figure 2.

As shown in Table 3, the results of the reliability test of the scale showed that the overall Cronbach's alpha of the scale was 0.917, and the Cronbach's alpha of each dimension was higher than 0.7. The AVE and CR values of the five

Table 2 The Results of Exploratory Factor Analysis

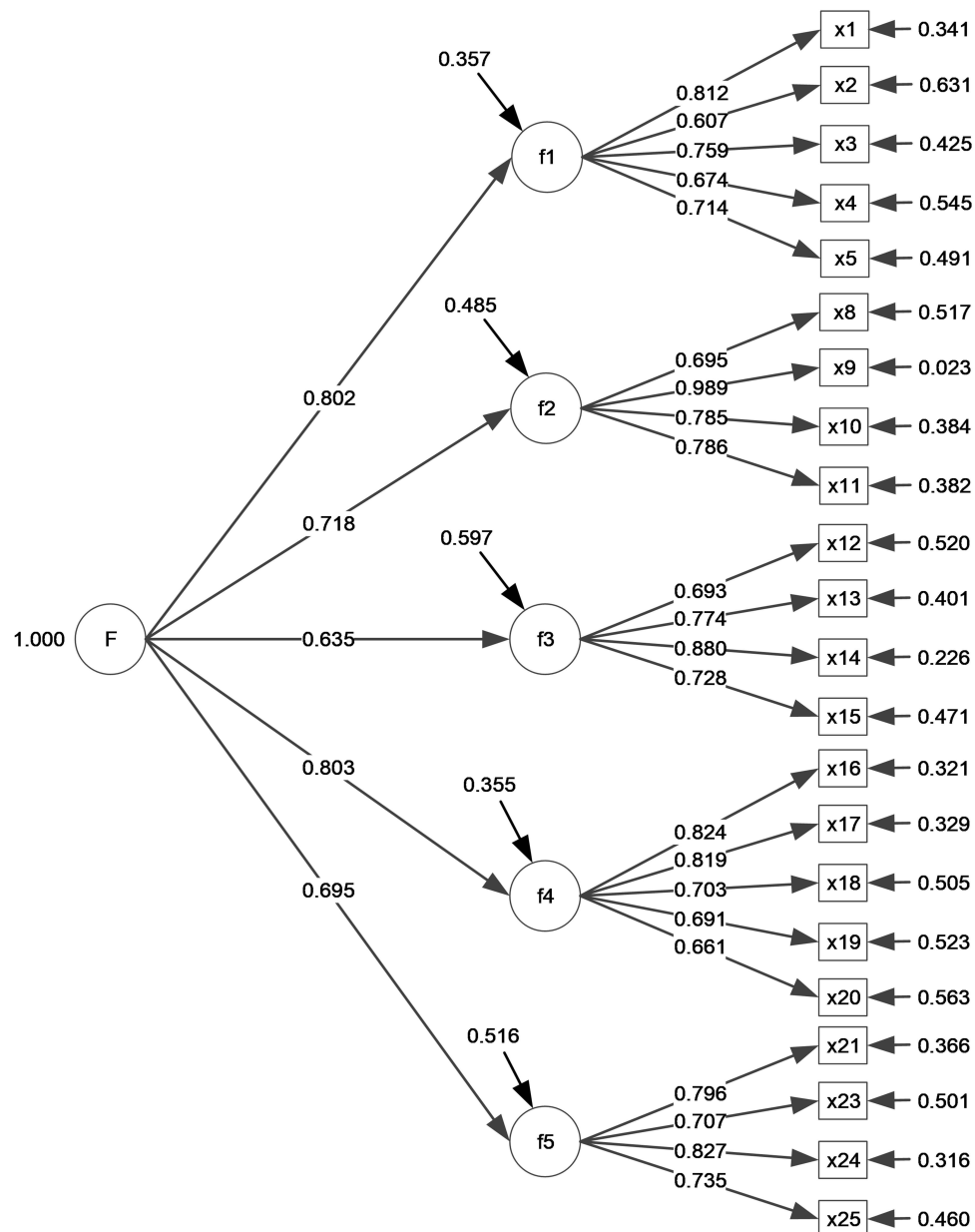| Number	Factor1 (Excellence)	Factor2 (Dedication)	Factor3 (Continuous Concentration)	Factor4 (Courageous Innovation)	Factor5 (Teamwork)
X1	0.837	0.238	0.045	0.029	0.068
X5	0.769	0.159	0.161	0.180	0.184
X4	0.644	0.235	0.082	0.130	0.230
X3	0.634	0.177	0.134	0.314	0.100
X2	0.616	−0.090	0.081	−0.003	0.222
X9	0.222	0.822	0.225	0.277	0.184
X8	0.146	0.768	0.123	0.281	0.191
X11	0.132	0.718	0.175	0.164	0.324
X10	0.162	0.700	0.193	0.212	0.139
X14	0.052	0.164	0.846	0.121	0.003
X13	0.181	−0.015	0.772	−0.010	0.216
X12	0.057	0.195	0.736	0.171	−0.042
X15	0.146	0.248	0.726	0.045	0.212
X17	0.133	0.209	0.034	0.802	0.008
X19	0.062	0.071	0.175	0.749	0.210
X18	0.133	0.180	0.014	0.742	0.054
X16	0.001	0.173	0.073	0.730	0.165
X20	0.233	0.184	0.093	0.654	0.226
X21	0.163	0.154	0.050	0.114	0.769
X25	0.341	0.076	0.124	0.158	0.704
X23	0.123	0.244	0.145	0.132	0.703
X24	0.198	0.267	0.056	0.229	0.669

dimensions met the criteria. As shown in Table 4, the correlation coefficients among the dimensions were all much smaller than the critical value of 0.85, and the arithmetic square root of the AVE of each factor was greater than the correlation coefficient between the factor and others. Thus, it is concluded that there is good discriminant validity among the dimensions of employee craftsmanship spirit. In conclusion, the scale developed in this study has good reliability and validity and can be used to measure the level of employee craftsmanship spirit.

In the second survey, employee craftsmanship spirit was measured by a 22-item scale developed by this study. The team members self-assessed their own craftsmanship spirit level, and the Cronbach's alpha was 0.975.

Other Measures

For spiritual leadership, the scale developed by Fry et al[62] was used, which includes three dimensions of vision, hope/belief, and altruistic love, with 17 items, and the Cronbach's alpha was 0.932. The measures of employee autonomous motivation adopted the autonomous motivation section of the workplace motivation scale developed by Gagne et al,[48] which has six items, and the Cronbach's alpha was 0.948. Caring ethical climate was measured using the caring ethical

Figure 2 The Results of Second Order Confirmatory Factor Analysis of The Craftsmanship Spirit Scale.
Abbreviations: F, Craftsmanship Spirit; f1, factor1 (excellence); f2, factor2 (dedication); f3, factor3 (continuous concentration); f4, factor4 (courageous innovation); f5, factor5 (teamwork); The value in the middle of the arrow is the factor loads, and the value in front of the arrow is the residuals.

climate section of the organizational ethical climate scale developed by Victor and Cullen,[63] which has five items and resulted in a Cronbach's alpha of 0.905.

In this study, a six-point Likert scale was used for each of these scales. The subjects completed the answers based on the descriptions of the items, and scores from one to six were recorded from "not at all" to "fully." In addition, demographic data were taken down for the individual employee, including gender, age, education level, nature of the company, work history, and time spent with the leader, and for the team leader, gender, age, education level, and work history were added to the questionnaire as control variables in this study, taking into full consideration the possible effects of the control variables on the results.

Table 3 The Results of Reliability and Validity Tests

Dimension	Cronbach's α	CR	AVE
Excellence	0.821	0.830	0.498
Dedication	0.875	0.840	0.568
Continuous concentration	0.827	0.854	0.595
Courageous innovation	0.847	0.855	0.543
Teamwork	0.826	0.804	0.507

Table 4 The Correlation Coefficient Between Dimensions

Dimension	Excellence	Dedication	Continuous Concentration	Courageous Innovation	Teamwork
Excellence	(0.706)				
Dedication	0.474**	(0.754)			
Continuous concentration	0.321**	0.440**	(0.771)		
Courageous innovation	0.383**	0.532**	0.277**	(0.737)	
Teamwork	0.524**	0.541**	0.310**	0.426**	(0.712)

Notes: The value in parentheses is the arithmetic square root of AVE; **: $p<0.01$.

Results

Common Method Bias Test

Some remedies were used in this study to minimize common methodological biases. For example, we collected multisource data from employees and leaders. In the survey, the respondents were given assurance that all data would be used for academic research only and that anonymity could be effectively guaranteed. They were also reminded that there were no incorrect or correct answers to reduce evaluation apprehension. In addition to the above-described ex-ante procedural remedies, one post hoc test was conducted, with reference to relevant studies,[64] to evaluate whether common method bias could have biased our findings.

First, Harman's single-factor test was used. The common method factor explained 42.68% of the variance, indicating that the common method bias in the study data was not significant. Then, a single-factor structural equation model was constructed, and the fit indices were found to be unsatisfactory: $\chi2/df$ = 22.936, RMSEA = 0.351, GFI = 0.438, NFI = 0.477, CFI = 0.487, and TLI = 0.431. Therefore, it can be concluded that there is no serious common method bias in this study.

Confirmatory Factor Analysis

To examine the discriminant validity of the four latent variables of spiritual leadership, employee craftsmanship spirit, employee autonomous motivation, and a caring, ethical climate, a confirmatory factor analysis was conducted with the help of AMOS 21.0 to construct each nested structural model. Since the overall items of spiritual leadership and employee craftsmanship spirit were relatively large, the measurement items of these two variables were packaged before testing to improve the fit of the models. The fit of each nested structure model is shown in Table 5. Among them, the four-factor model had the best fit, and the four latent variables of this study can be considered to have good discriminant validity, providing a high degree of confidence for the next statistical analysis.

Table 5 The Results of Confirmatory Factor Analysis

Models	χ^2	df	χ^2/df	RMSEA	GFI	NFI	CFI	TLI
1-Factor: SL+AM+ECS+CEC	3165.234	138	22.936	0.351	0.438	0.477	0.487	0.431
2-Factor: SL+AM, ECS+CEC	2599.239	136	19.112	0.345	0.507	0.571	0.583	0.530
3-Factor: SL+ECS, AM, CEC	1906.008	133	14.331	0.331	0.644	0.685	0.700	0.654
3-Factor: SL, AM, ECS+CEC	1799.928	132	13.636	0.171	0.640	0.703	0.717	0.672
3-Factor: SL+CEC, AM, ECS	1722.319	132	13.048	0.332	0.641	0.716	0.731	0.688
4-Factor: SL, AM, ECS, CEC	284.781	129	2.208	0.053	0.933	0.953	0.974	0.969

Abbreviations: SL, Spiritual leadership; AM, autonomous motivation; ECS, employee craftsmanship spirit; CEC, caring ethical climate.

Aggregation Test of Team-Level Data

Spiritual leadership in this study is a team-level variable, so it was tested for aggregation. The aggregation test was conducted by calculating Rwg, ICC (1), and ICC (2) in accordance with the prevailing practice. It was found that Rwg = 0.95, ICC (1) = 0.44, and ICC (2) = 0.77 for spiritual leadership met the criteria and thus could be aggregated as team-level data.

Descriptive Statistical Analysis

Before hypothesis testing, descriptive statistics were conducted for each variable, and the results are shown in Table 6. As seen from the data in the table, autonomous motivation is significantly and positively correlated with craftsmanship spirit (r=0.519, p<0.01), which provides preliminary support for the hypothesis.

Hypothesis Analysis

Main Effect Test of Spiritual Leadership on Employee Craftsmanship Spirit

To test the effect of team-level spiritual leadership on individual-level employee craftsmanship spirit, this study constructed several cross-level models and used HLM 6.08 software for analysis. The results of the HLM analysis are shown in Table 7. First, the null model (Model 1) was established without adding predictors, and ICC (1) = 0.344, which indicates that 34.4% of the variance of employee craftsmanship spirit is from the between-group variance, so it is necessary to introduce higher-level predictors. Second, cross-level Model 2 regarding the relationship between spiritual leadership and employee craftsmanship spirit was constructed, in which spiritual leadership significantly and positively predicted employee craftsmanship spirit (γ01=0.523, p<0.001), and Hypothesis H1 was verified.

Test of the Mediating Effect of Autonomous Motivation

To test the mediating effect of employee autonomous motivation in the process of spiritual leadership influencing employee craftsmanship spirit, cross-level models were established, and the results of HLM analysis are shown in Table 7. First, the predictor of level 2, spiritual leadership, was introduced into the model to build Model 6. Spiritual leadership significantly and positively predicted employee autonomous motivation (γ01=0.467, p<0.001), and Hypothesis H2 was verified. Second, for employee craftsmanship spirit, the predictor of level-1 employee autonomous motivation was introduced into the model to build Model 3, and it was found that employee autonomous motivation was significantly and positively related to employee craftsmanship spirit (γ10=0.565, p<0.001), and Hypothesis H3 was verified. Finally, for employee craftsmanship spirit, the predictor of level-1 employee autonomous motivation and the predictor of level-2 spiritual leadership were both introduced into the model to construct Model 4, and it was found that employee autonomous motivation significantly and positively predicted employee craftsmanship spirit (γ10=0.489, p<0.001). Spiritual leadership still significantly and positively influenced employee craftsmanship spirit (γ01= 0.299, p<0.001), but the impact coefficient significantly decreased compared to Model 2. γ01 decreased from 0.523 to 0.299;

Table 6 Descriptive Statistics and Correlations (N=434)

	Variable	M	SD	1	2	3	4	5	6	7
Individual Level	1. Gender	1.55	0.560	–						
	2. Age	3.50	1.283	0.045	–					
	3. Education level	2.31	0.794	0.095*	−0.183**	–				
	4. Working seniority	3.12	1.508	0.090	0.612**	−0.005	–			
	5. Co-work time	2.68	1.430	0.049	0.522**	−0.049	0.794**	–		
	6. Autonomous motivation	4.521	0.953	0.011	0.178**	0.111*	0.142**	0.021	–	
	7. Craftsmanship	4.518	0.945	−0.025	0.033	0.143**	0.118*	0.061	0.519**	–
Team Level	1. Gender of the leader	1.340	0.476	–						
	2. Age of the leader	3.447	1.144	−0.209*	–					
	3. Education level of the leader	2.602	0.943	0.173	0.021	–				
	4. Working seniority of the leader	4.223	1.057	0.101	0.436**	0.218*	–			
	5. Corporation nature	1.942	0.826	0.051	−0.532**	−0.118	−0.266**	–		
	6. Team size	4.210	0.836	−0.061	0.166	0.072	0.145	−0.180	–	
	7. Spiritual leadership	4.186	0.707	−0.097	0.059	0.019	0.112	0.091	0.078	–
	8. Caring ethical climate	2.983	1.214	−0.082	−0.03	0.178	−0.052	−0.006	0.127	−0.287**

Notes: **: $p<0.01$ and *: $p<0.05$.

thus, it can be concluded that employee autonomous motivation can partially mediate the positive effect of spiritual leadership on employee craftsmanship spirit.

To test the robustness of the mediating effect, the Monte Carlo method was used, and the analysis was conducted by R with the sampling number set to 20,000. The indirect effect of employee autonomous motivation was [0.121,0.422] at the 95% confidence interval, which does not include zero. It can be concluded that the mediating effect of employee autonomous motivation in the process of spiritual leadership influencing employee craftsmanship spirit is significant. In summary, Hypothesis H3 is verified.

Test of the Cross-Level Effect of Caring Ethical Climate

As shown in Table 7, for employee autonomous motivation, the Level-2 predictors spiritual leadership and caring ethical climate and the interaction term of spiritual leadership and caring ethical climate were introduced to construct Model 7. It was found that both spiritual leadership and the interaction term significantly predicted employee autonomous motivation ($\gamma01=0.498$, $p<0.001$; $\gamma11=0.160$, $p<0.05$), and Hypothesis H4 was confirmed.

To better illustrate the moderating role of caring ethical climate in the influence of spiritual leadership on autonomous motivation, the simple slope test of Aiken et al (1991) was used to plot the moderating effect. As shown in Figure 3, the regression straight line between spiritual leadership and autonomous motivation is steeper and has a larger slope value in a high caring ethical climate, indicating that autonomous motivation is more sensitive to changes in spiritual leadership.

Discussion
Discussion and Theoretical Implications

This study explored the effect of spiritual leadership on manufacturing employee craftsmanship spirit and the mediating role of employee autonomous motivation, and examined the moderating effect of caring ethical climate. After statistical

Table 7 The Results of Cross-Level Regression Analysis for Each Effect

Variables		Employee Craftsmanship Spirit				Autonomous Motivation		
		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept		3.188***	1.497*	1.547**	0.668	2.692**	1.159	3.881***
Control variables	Individual Level							
	Gender	−0.042	−0.049	−0.043	−0.059	−0.020	−0.020	−0.018
	Age	−0.077	−0.091*	−0.113**	−0.121**	0.000	−0.001	−0.005
	Education level	0.077	0.065	0.059	0.048	−0.002	−0.003	−0.006
	Working years	0.068	0.060	0.036	0.034	0.020	0.020	0.017
	Co-work time	−0.036	−0.029	0.022	0.023	−0.032*	−0.032*	−0.030
	Team Level							
	Gender of the leader	−0.096	−0.014	0.031	0.067	−0.190	0.117	−0.111
	Age of the leader	0.021	0.005	0.056	0.053	0.013	−0.006	−0.001
	Team size	0.168*	0.140	0.076	0.079	0.208	0.180	0.063
Level-1 predictor ($\gamma 10$)	Autonomous motivation			0.565***	0.489***			
Level-2 predictor ($\gamma 01$)	Spiritual leadership		0.523***		0.299***		0.467***	0.498***
	Caring ethical climate							0.613***
Interactive item (γ_{11})	Spiritual leadership* Caring ethical climate							0.160*
In-group variance$\sigma 2$		0.573	0.564	0.501	0.503	0.084	0.084	0.084
Between-group variance τ_{00}		0.301***	0.190**	0.151***	0.110***	0.782***	0.681***	0.406***

Notes: N(employee)=434, N(leader)=103. All coefficients are estimates of fixed effects (γ) under robust standard error. σ^2 is the residual of level 1, and τ_{00} is the intercept residual of level 2. ***: $p<0.001$, **: $p<0.01$, *: $p<0.05$.

analysis of 103 sets of leader-employee paired questionnaire data, the following conclusions were drawn. 1) Spiritual leadership significantly and positively influenced craftsmanship spirit, which is consistent with the majority of studies proposing that spiritual leadership positively affects output variables such as employees' work attitudes and behaviors.[14,30,31] The essence of spiritual leadership is to stimulate and meet the spiritual needs of employees,[12] while the essence of craftsmanship spirit is to meet people's needs for a better life by providing good products or quality services,[2] both of which have an inherent common direction in meeting people's high-level needs. Therefore, spiritual leadership can give spiritual impetus to the formation of employee craftsmanship spirit. (2) Autonomous motivation partially mediated the positive influence of spiritual leadership on craftsmanship spirit. Spiritual leadership influences employees' psychological state through spiritual interaction with them and thus has a unique effect in terms of spiritual motivation and psychological influence.[65] Spiritual leadership creates positive expectations and gives employees the feeling of being understood and appreciated, thus effectively satisfying their psychological needs and enhancing their autonomous motivation and ultimately stimulating and cultivating their craftsmanship.[42] (3) A caring ethical climate positively moderates the positive influence of spiritual leadership on employee autonomous motivation. Haldorai et al stated that the prevalence of ethical climate can be a powerful force for explaining individual behavior.[66] In a high level of caring ethical climate, whether it enables the interests of other members of the organization to be adequately ensured is

Figure 3 The Moderating Effect of Caring Ethical Climate on The Relationship Between Spiritual Leadership and Employee Autonomous Motivation.

an important consideration in employees' behavioral decisions,[57] which is highly compatible with the connotation of spiritual leadership, making employees more receptive to leaders' guidance and management. And thus more likely to generate autonomous motivation to strive to achieve organizational goals and to demonstrate a higher level of craftsmanship spirit motivated by autonomous motivation.

This paper contributes to the literature on spiritual leadership, autonomous motivation, and employee craftsmanship spirit in different ways. (1) This study provides a measurement tool reference for future empirical studies related to craftsmanship spirit. Most of the existing studies are qualitative analyses of the conceptual dimensions of craftsmanship spirit,[33] which greatly hinders the development of empirical studies on craftsmanship spirit. This study captures the structural dimensions of craftsmanship spirit and generates a measurement scale through a standardized development process, which provides a more scientific tool for measuring craftsmanship spirit and makes some fundamental contributions to future empirical studies to explore the formation mechanism and influence mechanism of craftsmanship spirit. (2) This study complements previous approaches to motivating craftsmanship spirit through extrinsic means by tapping into the intrinsic motivational model of spiritual leadership. Spiritual motivation plays an important role in stimulating and enhancing employee craftsmanship spirit by promoting their autonomous motivation, which can be equally effective in triggering positive performance.[42] While revealing the important role of spiritual leadership on employee craftsmanship spirit, this study also enriches the antecedents of craftsmanship spirit research. (3) This study explains and verifies the organizational climate conditions for strengthening the cultivation of employee craftsmanship spirit. While previous research on the role of leadership style on employee craftsmanship spirit has focused more on boundary conditions such as personal traits and work values,[1] this study finds that the synergy between spiritual support provided by spiritual leaders and a caring ethical climate is conducive to employees' autonomous motivation and performance. The findings enrich the boundary conditions of the effect of spiritual leadership on employees' attitudes and behaviors. In addition, the examination of the cross-level moderating effect is an active attempt to advance the research on craftsmanship spirit from single-level research to cross-level research.

Practical Implications

Our findings have several important implications.

(1) Improve HRM practices to enhance craftsmanship spirit. In terms of recruitment, organizations can consider using the craftsmanship spirit scale to measure the level of craftsmanship spirit of candidates to convey to candidates the organization's culture of admiring craftsmanship, attract candidates with compatible values, and hire candidates who are more likely to become craftsmen. In addition, since craftsmanship spirit requires employees to use innovative thinking to improve and perfect their work, organizations should give employees more autonomy in their work and allow them to

make appropriate adjustments and changes in their work processes, work methods, and work design. Moreover, organizations can include indicators of employees' dedication to work, process improvement, method updating, and teamwork in the appraisal system to guide employees to improve their craftsmanship spirit.

(2) Increase spiritual input from the perspective of managers and practice spiritual leadership to cultivate employee craftsmanship spirit. In the process of cultivating craftsmanship spirit, it is necessary to increase the spiritual investment of managers in addition to material investment. Leaders should depict visions and goals for employees and build beautiful blueprints so that employees can understand the organization's philosophy and establish goals and directions consistent with the organization. At the same time, leaders should also instill employees hope and belief to enhance their confidence. In addition, leaders need to care, support and respect employees, strengthen humanistic care, affirm the spiritual existence of employees, and meet their spiritual needs. In short, leaders need to inspire employees' autonomous motivation, enhance their internal drive, and give full play to the power of spirit by showing spiritual leadership behaviors such as vision leading, faith inspiring, awakening hope and altruistic caring to effectively cultivate employee craftsmanship spirit.

(3) Create a caring ethical climate and strengthen the cultivation of craftsmanship as the motivational role of leadership and self-control of employees alone cannot maximize employee craftsmanship spirit. Organizations should not only protect the work welfare of employees but also properly recognize the important role of teamwork. It is important to try to let all employees experience an atmosphere of mutual love and a win–win situation within the organization so that they will be confident in the organization and full of energy for the work, which will prompt them to willingly devote more time and energy to the organization. In addition, organizations should build good communication channels so that employees can help each other when they encounter problems in the process of completing tasks, thus improving teamwork and ultimately enhancing craftsmanship spirit.

Limitations and Future Research Directions

With its contributions, there are still limitations to this study that need to be further explored and improved in subsequent studies in the following aspects. (1) This study found that autonomous motivation can only partially mediate the influence of spiritual leadership on employee craftsmanship spirit, and there may be other mediating paths. In addition, this study only examined the moderating effect of caring ethical climate, and future studies can select other mediating and moderating variables to conduct more comprehensive and in-depth analysis. (2) Except for the craftsmanship spirit measurement scale, the scales adopted in this study are mainly translated from the scales developed in other contexts. Although the selected scales are authoritative, there may be limitations in applying scales developed in foreign contexts directly to the Chinese context. Future research may consider developing scales that are consistent with the Chinese cultural context, specifically the organizational and cultural environment in China. Future research should also adopt longitudinal studies or collect questionnaires through multiple waves to compensate for the shortcomings of cross-sectional research in this study.

Ethics Statement

In carrying out this research work, the Ethical Code of Conduct of American Psychological Association (APA) was complied with. A cover letter suggesting the willingness of respondents' participation and confidentiality of their responses were given to respondents after we had taken permission from the board of directors. Participation was voluntary and respondents were free to quit at any point in time. Informed consent was obtained from all respondents. Also, We have followed the exact course of actions concerning dealing with humans in research and fulfilled the Helsinki Declaration on informed consent and human rights. This research work was supervised by a professor from Jiangsu University and the study was approved by the Institutional Review Board of Jiangsu University.

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Disclosure

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