Mediating effect of perceived stress between social capital and work satisfaction among modern service industry workers in Shanghai

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Research article

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Abstract

Background To explore the relationship among social capital, perceived stress, and work satisfaction to provide a basis for improving work satisfaction among modern service industry workers.

Methods A total of 737 employees from two units belonging to modern service industries in Shanghai were investigated through purposive sampling. A self-administered anonymous questionnaire was used to collect data. The relationships among these variables were analyzed using a multiple linear regression model and structural equation model.

Results After controlling for demographics, perceived stress was shown to be a negative predictor of work satisfaction, while social capital had a significant positive predictive effect. Structural equation modeling confirmed that perceived stress partially mediated the relation between social capital and work satisfaction.

Conclusion Social capital could be an efficient method for improving work satisfaction directly or indirectly by reducing perceived stress.

Background

With the reforms and opening up in China since the 1980s, urbanization has steadily progressed, greatly promoting socioeconomic development and improving living standards [1]. However, rapid urbanization also brings with it a number of problems [2–4], such as the pollution of the urban environment, a shortage of social resources, and rapid increases in the cost of health care. All of these factors may have a tremendous impact on workers’ satisfaction with city life, especially for those working in the modern service industry. As defined in the report of China’s Fifteenth National Congress, the modern service industry refers to those providing high value-added, high-tech, knowledge-based production and life services based on modern science and technology (especially information network technology). Different from traditional service industries (restaurant, retail, and so on), it includes financial and insurance industries, business services, and the residential community service industry, among others. Along with socioeconomic development, the modern service industry has become the top sector in China (according to number of employees and economic output) in first-tier cities such as Beijing and Shanghai [5]. The problems associated with workers in this industry (commonly known as white-collar workers) should, therefore, not be overlooked.

Work satisfaction is a hot social topic that has received a great deal of attention. While there is still no consensus on the definition of work satisfaction, a widely accepted definition is the one proposed by Locke [6], who described work satisfaction as the positive emotions obtained from all aspects of work. It is generally accepted that work satisfaction has a significant relationship with employees’ turnover intention [7]. To reduce the social-benefit loss caused by low work satisfaction, researchers have investigated its key influencing factors, including areas such as the work environment [8] and individual personalities [9].
Above all, job stress is thought to play an important role in the decline of work satisfaction [10–11] and thereby contribute to unusually high staff turnover [12]. According to the “cognitive theory of stress,” perceived stress, as supposed to stress itself, warrants the most attention [13]. External stressors would no longer trouble us if we thought them solvable. Along these lines, some studies have shown that low perceived stress may serve as a protection factor for work satisfaction [14–15]. Since the relevant studies have mostly been conducted among non-Chinese populations, there is a need to explore this area in the Chinese context.

The relationship between social capital and work satisfaction has also attracted a great deal of attention in recent years. Social capital [16] is a special type of resource in a social network and is defined by its function. It can include norms, trust, information channels, and social values. Social capital has been viewed as a useful strategy for supporting mental health [17–19]. Studies have also shown that workplace social capital might be associated with employees’ work satisfaction [20].

In summary, in light of worsening work satisfaction, it would be quite useful to explore the possible effect of social capital on work satisfaction and the role of perceived stress in this connection. To our knowledge, little research has focused on the relationships among perceived stress, work satisfaction, and social capital (especially the latter two). In addition, insufficient attention has been paid to modern service industry workers. Therefore, this study explored the relationships among these three factors through a cross-sectional study based on modern service industry workers in Shanghai in order to provide a basis for improving their work satisfaction.

**Methods**

**Sampling and survey methods**

From March to April 2016, a cross-sectional study was conducted with two units from modern service industries in Shanghai. A total of 1,200 employees were invited to participate via non-randomized sampling, and 737 filled out the questionnaires. After excluding incomplete or otherwise unusable questionnaires, 678 were used for analysis. The effective response rate was 61.41%, and the efficiency of questionnaire recovery was 92%.

For quality control, the Qingpu Patriotic Health Committee was mainly responsible for site investigation, with assistance from the personnel departments of the two units. After they received training, the investigators managed the distribution, audit, and recovery of the questionnaires. The respondents gave informed consent and completed the questionnaire anonymously according to introductory instructions given in the questionnaire.

**Questionnaire**
1) Perceived Stress Scale (PSS–10): the PSS–10 was revised by Cohen et al. through factor analysis based on the PSS–14. The scale contains two dimensions: crisis perception (six items) and coping ability perception (four items). It has a total of 10 items, all scored 0–4 based on a 5-item Likert scale. Typically, the score for the coping ability perception dimension is reversely calculated. The total score is the sum of all items’ scores. The higher the final score, the higher the perceived stress in the past month. In this survey, Cronbach’s alpha of the questionnaire and its two dimensions were 0.769, 0.862, and 0.865, respectively.

2) Overall Work Satisfaction Scale: this scale was compiled by Brayfield and Rothe to measure the overall satisfaction of workers. It contains six items. The total score is the sum of each item score. The internal consistency coefficient of the survey population was 0.896.

3) Workplace Social Capital Scale: this was developed by Kouvonen et al. and further revised and localized by Gao et al. to assess workplace social capital in China. The scale includes eight items, and the total score is the average value of these items. The internal consistency coefficient of the survey population was 0.957.

4) General demographic characteristics: the questionnaire collected the general demographic characteristics of the respondents, including gender, age, marital status, education, job position, and household income.

### Statistical analysis

EpiData 3.1 was used to establish the database, and SPSS 19.0 was used to process and analyze the data. Single-factor variance analysis was used to compare the differences in perceived stress, work satisfaction, and social capital among the individual characteristics. After controlling for other related variables, a multiple linear regression model was used to analyze the associations among perceived stress, social capital, and work satisfaction and to explore the possible mediating role of perceived stress. A structural equation model was also constructed for further validation using AMOS 24.0. The difference was recognized as statistically significant if p<0.05.

### Ethics

The study was approved by the Institutional Review Board (IRB) of the School of Public Health of Fudan University with an IRB approval number of IRB #2015–12–0574 and written informed consent was obtained from all subjects.

### Results

#### General demographic characteristics
The ratio of men and women was 1.23:1, and the average age was 33.67±7.24 years. Nearly half were 31–40 years old. The education level was mainly undergraduate, accounting for 37.2% of the respondents. A total of 70.8% of the respondents worked in grassroots posts, with 67.3% performing regular 8-hour work days. A total of 64.5% had been hired in the last 5 years. Regarding average monthly income, 48.5% made 2000–4999 yuan, while 24.9% made 10,000 yuan or more. A total of 79.1% of the respondents were married.

The perceived stress score was 14.78±5.72, while the crisis perception and coping ability perception dimensions were 7.56±4.21 and 7.23±3.97, respectively. The average social capital score was 3.55±0.76, and the average work satisfaction score was 19.55±4.14 (see Table 1 for details).

Simple correlation

The correlation among perceived stress, social capital, and work satisfaction was investigated using Pearson’s correlation analysis. The results showed that perceived stress was negatively correlated with work satisfaction, and social capital was significantly correlated with work satisfaction (Table 2).

Table 2. Correlation analysis of perceived stress, social capital, and work satisfaction

|                      | Work satisfaction | Social capital | Perceived stress | Crisis perception | Coping ability perception |
|----------------------|-------------------|----------------|------------------|------------------|---------------------------|
| Work satisfaction    | –                 | –              | –                | –                | –                         |
| Social capital       | 0.711**           | –              | –                | –                | –                         |
| Perceived stress     | -0.365**          | -0.355**       | –                | –                | –                         |
| Crisis perception    | -0.369**          | -0.315**       | 0.721**          | –                | –                         |
| Coping ability perception | -0.136**    | -0.177**       | 0.678**          | -0.020           | –                         |

Note: ** significant at the 0.01 level.

Multiple linear regression

In this study, perceived stress and social capital served as independent variables, and general demographic characteristics were the adjusting variables. Using hierarchical multiple linear regression analysis, we aimed to explore the influence of the factors on work satisfaction. The first step was to add the adjustment variables to the regression model (Model 1). Then, social capital and perceived stress were put into the model (Model 2). After controlling gender, age, education level, and other demographic variables, social capital was shown to be a positive predictor of work satisfaction, while perceived stress had a significant negative effect. The adjusted R2 increased 46.6%. Of all the factors included, social capital showed a relatively strong impact on job satisfaction (Table 3).
Mediating effect

Based on the multiple linear regression, we applied structural equation modeling to further examine the mediating effect of perceived stress between social capital and work satisfaction. Figure 1 and Table 4 show the details. The results indicated that the direct and indirect effects were both statistically significant (p<0.05).

**Figure 1. Effect of perceived stress between social capital and work satisfaction**

**Table 4. Result of mediating effect**

|                      | Perceived stress | Work satisfaction |
|----------------------|------------------|-------------------|
| **Social capital**   |                  |                   |
| direct effect        | -0.365**P=0.001**| 0.716**P<0.001**  |
| indirect effect      | /                | 0.050**P<0.001**  |
| **Perceived stress** |                  |                   |
| direct effect        | /                | -0.138**P<0.001** |
| indirect effect      | /                | /                 |

Discussion

The respondents in this research were modern service industry workers from two units in Shanghai. The average score for the six items on the work satisfaction scale was 3.25, indicating significant room for improvement.

The single-factor analysis of work satisfaction indicated that it may be associated with age, education level, work schedule, length of employment, and gender [21–25]. The relationships between age and work satisfaction showed a U-shaped trend. This is perhaps because younger employees may receive more care and face fewer difficulties associated with living independently, while older employees may have rich life experiences and a stable network of relationships. By contrast, middle-aged workers may face more challenges and setbacks in life and thus have lower work satisfaction. The same seemed to hold true for the length of employment. Those hired within the last 5 years showed higher life satisfaction and social support. Regarding education, those with a junior high school education showed the highest work satisfaction. This could be partly related to lower psychological expectations as well as the distribution of the survey population: most with a junior high education had a shorter length of employment. Previous studies have also noted differences stemming from work schedules. This could be because shift work
can require long hours and is characterized by less peer support since work hours are usually staggered with colleagues.

However, according to the multiple linear regression analysis, general demographic characteristics explained little in terms of work satisfaction. The adjusted R2 was only 0.082, suggesting that focusing on work schedule, marital status, and other demographic variables might not be effective for improving work satisfaction. Indeed, there is a need for more focus on factors such as social capital and perceived stress.

Many studies have investigated the relationship between social capital and work satisfaction. Imam et al. [26] suggested that social capital can enhance work satisfaction. Huang [27], moreover, reported that social capital could improve job satisfaction in hospitals in Taiwan. In the present study, Pearson’s correlation for social capital and work satisfaction was 0.711 and was significant at the 0.05 level. Further linear regression analysis showed a strong protective effect of social capital on work satisfaction. Forms of social capital such as corporate identity, mutual assistance, and trust may help employees enhance their sense of belonging, cope with challenges at work, and experience improved work satisfaction. Strömgren et al. [28], Shin et al. [29], and others have verified as much, especially in terms of the significant effect of trust (including interpersonal and organizational) on work satisfaction.

Regarding perceived stress, the simple correlation analysis showed that it was negatively associated with work satisfaction. Stratified regression analysis confirmed that perceived stress had a negative predictive effect on work satisfaction. The current fast-paced, competitive work environment has placed higher requirements on workers’ self-regulation ability and learning ability, among others. When stress levels become high and are perceived by staff, they may adversely affect mental health, work positivity [30], and job satisfaction to the point of resigning from their jobs. Enterprises could counter such outcomes by providing services such as psychological counseling, mutual aid platforms, vocational training, and other means of social support [31]. In this way, social capital may affect work satisfaction by intervening in stress perception.

Since previous research has mainly focused on the relationship between the two factors of social capital and work satisfaction, we explored three factors—social capital, perceived stress, and work satisfaction—using Amos 24.0 to construct the structural equation model. The test for mediating effect was based on Baron and Kenny’s [32] in-turn-test theory: given the existence of significant relationships among the independent variables, dependent variable, and intermediary variable, the correlation coefficient between the independent and dependent variables should be tested to determine whether there is a complete or partial mediation effect.

Since the results of the previous correlation tests and multiple linear regression satisfied the prerequisites for mediating effect, further verification of direct and indirect effects showed that perceived stress played a partial mediating role between social capital and work satisfaction. In other words, social capital may directly affect work satisfaction, or it might also indirectly influence work satisfaction by improving stress
perception ability. Therefore, work satisfaction may be improved by strengthening employees’ social capital, thus aiding both enterprises and society.

This study has some limitations. First, it was designed as a cross-sectional study, and the respondents were employees at just two modern service institutions in Shanghai. As such, the findings have poor generalizability. Second, the mediating effect of social capital and work satisfaction only incorporated perceived stress, and the model contained limited variables. Future research can further expand the relevant factors and other outcome variables. Despite these limitations, this study can serve as a supplement for work on the relationship between social capital and work satisfaction and provide a reference for dealing with the problem of low work satisfaction among modern service industry workers.

**Conclusion**

In summary, this study revealed that social capital could be an efficient method to improve work satisfaction directly or to improve it indirectly by reducing perceived stress. We hope this study’s findings can provide a reference for further explorations of solutions to promote high levels of work satisfaction.

**Declarations**

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**Availability of data and materials**

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

**Author’s Contributions**

H. F. and J. D. developed the concept and design; H. F., J. D. and J. G. acquired the funding; J. D., N. W. and Z. L. did the survey; H. F., J. D. and J. G. provided project administration and resources; J. D. and C. W. supervised and validated the item; N. W., Z. L. and J. D. wrote and revised the manuscript. All authors read and approved the final manuscript.
Ethics approval and consent to participate

This study was approved by the Institutional Review Board (IRB) of School of Public Health, Fudan University (IRB approval number: IRB #2015–12–0574) and written informed consent was obtained from all subjects. Information about the aims of the study, the task and the procedure was provided to the participants, who could withdraw their participation at any stage.

Consent for publication

Not applicable

Competing interests

The authors declare no conflict of interest.

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Tables

Table 1. General demographic characteristics of modern service industry workers
| Variable               | N  | Perceived stress | Crisis perception | Coping ability perception | Social capital | Work satisfaction |
|------------------------|----|------------------|-------------------|---------------------------|----------------|------------------|
| **Gender**             |    |                  |                   |                           |                |                  |
| male                   | 369| 15.12±5.81       | 7.84±4.42         | 7.28±3.99                 | 3.52±0.79      | 19.22±4.42*      |
| female                 | 300| 14.33±5.62       | 7.20±3.93         | 7.13±3.96                 | 3.58±0.71      | 19.92±3.78       |
| **Age**                |    |                  |                   |                           |                |                  |
| ≤30                    | 225| 14.57±5.45*      | 7.26±3.90*        | 7.31±4.09                 | 3.69±0.76*     | 20.10±4.24*      |
| 31–40                  | 332| 15.23±5.80       | 8.00±4.44         | 7.23±3.73                 | 3.44±0.74      | 19.05±3.99       |
| ≥41                    | 106| 13.58±6.12       | 6.63±4.03         | 6.94±4.45                 | 3.60±0.78      | 20.17±4.10       |
| **Marital status**     |    |                  |                   |                           |                |                  |
| single                 | 130| 14.00±6.12       | 7.55±3.91         | 6.46±3.68*                | 3.62±0.78      | 19.66±4.58       |
| married                | 536| 14.93±5.60       | 7.53±4.28         | 7.40±4.03                 | 3.53±0.75      | 19.51±4.01       |
| **Education level**    |    |                  |                   |                           |                |                  |
| middle school          | 135| 15.37±5.06**     | 6.88±3.94*        | 8.49±3.95**               | 3.76±0.72*     | 20.67±3.93**     |
| high school or         | 173| 15.48±5.97       | 7.97±4.75         | 7.52±4.32                 | 3.39±0.73      | 18.84±3.91       |
| specialized school     |    |                  |                   |                           |                |                  |
| junior college         | 104| 15.71±5.63       | 8.00±4.24         | 7.71±3.86                 | 3.47±0.78      | 18.63±4.59       |
| undergraduate          | 206| 13.20±5.70       | 7.27±3.70         | 5.93±3.34                 | 3.57±0.76      | 19.88±4.02       |
| postgraduate           | 46 | 14.96±6.17       | 8.77±4.34         | 6.19±3.37                 | 3.54±0.74      | 19.04±4.21       |
| **Average monthly household income** |    |                  |                   |                           |                |                  |
| <2,000                 | 47 | 14.65±6.61       | 7.79±4.54         | 6.86±4.21**               | 3.50±0.72      | 19.00±4.39       |
| 2,000–4,999            | 329| 15.22±5.32       | 7.36±4.25         | 7.87±4.07                 | 3.54±0.75      | 19.55±4.20       |
| 5,000–9,999            | 126| 14.82±6.11       | 7.58±4.41         | 7.24±3.73                 | 3.60±0.83      | 19.77±4.18       |
| ≥10,000                | 169| 13.88±5.90       | 7.76±3.90         | 6.12±3.67                 | 3.53±0.72      | 19.49±3.97       |
| **Position**           |    |                  |                   |                           |                |                  |
| high level             | 23 | 10.32±6.99**     | 5.59±4.47         | 4.73±4.60**               | 3.78±0.68      | 21.09±4.01       |
| middle level           | 141| 13.85±5.84       | 7.53±3.88         | 6.31±3.82                 | 3.56±0.72      | 19.73±4.07       |
| grassroots             | 480| 15.15±5.58       | 7.60±4.31         | 7.55±3.94                 | 3.55±0.77      | 19.45±4.20       |
| **Work schedule**      |    |                  |                   |                           |                |                  |
| 8-hour day             | 456| 14.29±5.77*      | 7.39±4.00         | 6.90±3.93*                | 3.61±0.76*     | 20.03±4.18**     |
|                |       |       |       |       |       |       |
|----------------|-------|-------|-------|-------|-------|-------|
| shift work     | 113   | 15.25±5.92 | 8.02±5.07 | 7.23±4.14 | 3.37±0.75 | 17.80±4.01 |
| others         | 77    | 15.87±5.50 | 7.51±4.12 | 8.36±3.94 | 3.51±0.75 | 19.42±3.80 |

**Length of employment**

|       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|
| ≤5    | 437   | 14.88±5.41 | 7.36±4.09 | 7.52±4.04* | 3.63±0.74** | 20.04±3.91** |
| 6–10  | 169   | 14.23±6.00 | 7.77±4.16 | 6.47±3.67  | 3.40±0.75 | 18.68±4.37 |
| ≥11   | 59    | 15.60±7.12 | 8.45±5.17 | 7.15±4.08  | 3.28±0.74 | 17.94±4.16 |

Note: * p<0.05, # p<0.01, ** p<0.001.

**Table 3.** Multiple linear regression of work satisfaction with perceived stress and social capital
| Variable               | Model 1  | Model 2  |
|-----------------------|----------|----------|
| Gender                | -0.011   | 0.005    |
| Age                   | 0.057    | 0.033    |
| Marital status        | 0.016    | 0.041    |
| Education level       |          |          |
| middle school         | 0.161*   | 0.059    |
| senior high           | 0.105    | 0.098    |
| junior college        | 0.021    | 0.004    |
| undergraduate         | 0.063    | 0.042    |
| Monthly income        |          |          |
| <2,000                | -0.083   | -0.041   |
| 2,000–4,999           | -0.037   | 0.005    |
| 5,000–9,999           | 0.029    | 0.013    |
| Position              |          |          |
| senior                | 0.104*   | 0.030    |
| secondary             | 0.057    | 0.020    |
| Work schedule         |          |          |
| 8-hour day            | 0.152*   | 0.056    |
| shift work            | -0.043   | -0.091   |
| Length of employment  | -0.206** | -0.070   |
| Perceived stress      | -0.142** |          |
| Social capital        | 0.639**  |          |
| F                     | 4.413**  | 41.315** |
| Adjusted R²           | 0.082    | 0.546    |

Note: * p<0.05, ** p<0.001
Figures

Figure 1

Effect of perceived stress between social capital and work satisfaction