Exploring Guanxi: Using Interpersonal Competence of Managers in Construction Projects

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Abstract. Based on the comparison between Guanxi and western relationship management, this research puts forward the hypothesis of the dimension of interpersonal competence of project manager based on Guanxi, and applies a conceptual framework to measure the interpersonal competence of Chinese construction project manager. Following the standard procedures for scale development and a detailed analysis of 450 data sources, a three-dimensional structural model of the interpersonal competence of project managers is tested and confirmed to be the best fitting model. Therefore, this research developed a scale which can directly assess project manager interpersonal competence. It is not only beneficial to improving the interpersonal competence of project manager, but also provides the reference suggestion that western countries understand Guanxi in project manager job application and western business partners how to abide by the Guanxi traditional.

1. Introduction
Released by Ministry of Housing and Urban–Rural Development of the People’s Republic of China in 2017, “the code of construction project management” clearly stipulates the definition of construction project managers (CPMs) as an authorized agent legally representing the enterprise of a construction project. CPMs are not only responsible for project implementation, but also market-oriented functions via communicating with clients and coordinating internal and external project interactions for the entire implementation process[1]. In the construction project, the participants in the relationship between people has become the strategic issues having effects on the performance of project management[2]. Relationships, emphasized on cooperation, trust, communication and coordination, may reduce divergence, conflict encountered with the different aims of each participants, which can also contribute to 30% of a projects cost being wasted[3]. Thus, the interpersonal competence of CPMs is attracting the attention of more and more scholars.

Thus, this research focuses on interpersonal competence of CPMs in the construction industry. In short, Guanxi is social connections between people. It is generally built up through long-term interaction and communication. The construction industry closely involves social ethics, organizational form and social transformation[4]. Therefore, in this study, the structure of interpersonal competence of project managers is analyzed based on the cultural background. And a measurement scale is constructed and empirically tested.

2. Implications and structure of CPM’s interpersonal competence based on Guanxi
Based on Chinese Guanxi theory, we define interpersonal competence of CPMs as the establishment
and development of obligations and responsibilities (emotional component and instrumental component) between individuals and the competence to apply these.

CPMs serve as the highest direct decision maker and the first responsible person of project management, a central character who is critical for achieving the project objectives. CPMs are in the central position of Guanxi network, according to analysis and classification of Chinese Guanxi, the Guanxi base refers to the establishment of established social relationship among the project manager and the stakeholders involved in the process of project interaction. Incomplete contract and uncertain external environment lead to the way forward, in which conflicts are constantly solved by the parties. And a high level of Guanxi can promotes cooperative and reduces conflic{5]. CPMs, first responsible person, in the central Guanxi network, his best expression of interpersonal competence is the ability to deal with conflicts based on comprehensive application of emotional component (irrationality) and instrumental component (rationality).

Thus, according to the above analysis, as the Fig.1, the structure of CPM’s interpersonal competence could be divided into three dimensions: competence related to application instrumental relationships, competence related to application emotional relationships and competence related to handling interpersonal relationships conflicts.

Figure 1. The dimension classification of interpersonal competence of CPMs based on Chinese Guanxi

3. Empirical study and questionnaire development

3.1 Subjects and data collection

In this study, 450 questionnaires were distributed in twice to MPM (Master of Project Manager) students, constructor training students and project managers at the site which come from all over the country. And it were measured on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). Sample 1, 200 questionnaires were distributed, out of which 172 were received back. 19 questionnaires had too much blanks or obvious biases and were excluded, giving rise to 153 valid questionnaires, with an effective rate of 76.5%. Sample 2, 250 questionnaires were administered, and 204 were recovered. And 20 questionnaires were excluded, giving rise to 184 valid questionnaires, with an effective rate of 73.6%. Totally 337 questionnaires were available.

3.2 Pre-test and analysis of the scale

As shown in Table 1, 15 items were retained in a total of three factors, accounting for 62.886% of the total variation. The α value of the entire scale was 0.908 and greater than 0.7 for each of the dimensions, therefore exhibiting good reliability.

Table 1. The exploratory factor analysis

| Item no. | Short description of items | Loading | Cronbach’s α | Cumulative variance explained |
|---------|---------------------------|---------|--------------|-------------------------------|
| Factor 1: Competence related to application instrumental relationships |   |
|-------------------------------------------------------------|---|
| **AL1** | I will offer Renqing to the other party in accordance with his or her role and status in the project work. |
| **AL2** | I will offer Mianzi to the other party in speech and act. |
| **AL3** | I will create more opportunities to make a contact, such as gift-giving and winning and dining. Under the premise of reasonable benefit, I will consider the other party’s status and interest desire positively to promote cooperation. |
| **AL4** | |
| **Factor 2: Competence related to application emotional relationships** |   |
| **BL1** | I will maintain close contact with the other party with phone, QQ or WeChat. |
| **BL2** | I will communicate with the other party actively about the issues in the process of project implementation, which can lead us to reach a consensus. |
| **BL3** | I will offer help to solve the other party’s difficulties encountered in work or in life without hesitation. |
| **BL4** | I will pay close attention to the other party’s achievements and congratulate on it. |
| **BL5** | To understand others or develop friendships with others, I develop same hobbies and interests. |
| **BL6** | I can detect the implied meaning and psychological activities in the other party’s speech and put consideration on it. |
| **BL7** | I will share the other party’s anxieties and annoyances on my own initiative. |
| **Factor 3: Competence related to handling interpersonal relationships conflicts** |   |
| **CL1** | I can put myself in stakeholders’ shoes to consider the issues in the project in order to avoid being one-sided which can produce conflicts or make it worse. |
| **CL2** | I will defend for myself with reasoned evidence and avoid immature comments, when I meet a relational conflict with other stakeholders. I will attempt to synthesize a best scheme from all the stakeholder’s viewpoints, when there are relational conflicts among different stakeholders in the process of project. |
| **CL3** | I will listen to the advices with an open mind, when I meet relational conflict with the owner, consultant company and other stakeholders. |
| **CL4** | |

|   |   |
|---|---|
| 0.734 | 29.085 |
| 0.793 |   |
| 0.710 |   |
| 0.653 |   |
| 0.629 |   |
| 0.820 |   |
| 0.819 |   |
| 0.770 |   |
| 0.751 |   |
| 0.726 |   |
| 0.725 |   |
| 0.648 |   |
| 0.781 | 62.886 |
3.3 Formal verification and confirmation of the scale

Firstly, as shown in Table 2, whether it was a single-factor structure or three two-factor structures, their fit with the data were all significantly inferior in comparison with that of the three-factor structure. Therefore, the three-factor structure was deemed the best measurement model for relationship strength.

Table 2. Fitting test of the overall models

| Structural model            | CMIN  | DF  | CMIN/DF | RMSEA | GFI   | AGFI  |
|-----------------------------|-------|-----|---------|-------|-------|-------|
| 3-factor structural         | 128.097 | 87  | 1.472   | 0.053 | 0.907 | 0.871 |
| Single-factor model         | 347.653 | 90  | 3.863   | 0.131 | 0.736 | 0.649 |
| Factor 1=Factor 3           | 247.355 | 89  | 2.779   | 0.103 | 0.810 | 0.744 |
| Factor 1=Factor 2           | 198.647 | 89  | 2.232   | 0.086 | 0.847 | 0.794 |
| Factor 2=Factor 3           | 250.642 | 89  | 2.816   | 0.104 | 0.809 | 0.742 |

Secondly, this dissertation conducts the reliability analysis of the formal questionnaire samples. As shown in Table 3, the reliability analysis of the scale of interpersonal competence of project managers showed that, except for item CL4 (0.475), the correlation coefficients between each of the items and the overall dimensions were higher than 0.5. The Cronbach’s α value of the entire scale was 0.911, while the Cronbach’s α values of the categorical scales, i.e., competence related to establishing instrumental relationships and emotional relationships, and competence related to handling interpersonal relationship conflicts, were 0.802, 0.903, and 0.811, respectively.

Table 3. Reliability analysis of the scale of interpersonal competence of project managers

| Items | Corrected Total Correlation | Cronbach's Alpha if Item Deleted | Cronbach's Alpha |
|-------|-----------------------------|----------------------------------|-------------------|
| AL1   | 0.523                       | 0.908                            | 0.911             |
| AL2   | 0.531                       | 0.908                            | 0.802             |
| AL3   | 0.572                       | 0.906                            | 0.907             |
| AL4   | 0.526                       | 0.908                            | 0.745             |
| BL1   | 0.565                       | 0.907                            | 0.899             |
| BL2   | 0.531                       | 0.908                            | 0.901             |
| BL3   | 0.763                       | 0.899                            | 0.904             |
| BL4   | 0.739                       | 0.900                            | 0.902             |
| BL5   | 0.732                       | 0.901                            | 0.907             |
| BL6   | 0.632                       | 0.904                            | 0.907             |
| BL7   | 0.702                       | 0.902                            | 0.904             |
| CL1   | 0.546                       | 0.907                            | 0.907             |
| CL2   | 0.635                       | 0.904                            | 0.811             |
| CL3   | 0.626                       | 0.905                            | 0.910             |
| CL4   | 0.475                       | 0.910                            |                   |

Thirdly, this research conducts structural validity test of the three-factor structural model. The results of the analysis are shown in Figure 3 and Table 4. The results indicate that the load of each of the factors was greater than 0.5 and statistically significant; the composite reliabilities of each of the factors were 0.8001, 0.9053, and 0.8177 and the minimum value of the AVE of the factors was 0.50069 which indicates that the scale had a good convergent validity.

Table 4. Convergent validity test

| Factor | Item | Non-standardized factor load | S.E. | C.R. (t-value) | P  | Standardized factor load | Composite validity | AVE  |
|--------|------|------------------------------|------|---------------|----|--------------------------|-------------------|------|
| Factor 1 | AL1  | 1.000                        | 1.000| 1.000          | 0.670 | 0.696                    | 0.8001            | 0.50069|
|        | AL2  | 1.156                        | 0.15 | 7.443         | *** | 0.745                    |                   |      |
|        | AL3  | 1.291                        | 0.16 | 7.661         | *** | 0.727                    |                   |      |
|        | AL4  | 1.201                        | 0.15 | 7.826         | *** | 0.707                    |                   |      |
| Factor 2 | BL1   | 1.000 | 1.000 | 0.660 |
|---------|-------|-------|-------|-------|
|         | BL2   | 0.880 | 0.11  | 7.371 | ***  | 0.627 |
|         | BL3   | 1.299 | 0.13  | 9.458 | ***  | 0.839 |
|         | BL4   | 1.251 | 0.13  | 9.465 | ***  | 0.9053 |
|         | BL5   | 1.053 | 0.11  | 9.257 | ***  | 0.5804 |
|         | BL6   | 0.919 | 0.11  | 8.230 | ***  | 0.720 |
|         | BL7   | 1.007 | 0.11  | 8.10  | ***  | 0.768 |
|         | CL1   | 1.00  |       | 1.00  |      | 0.677 |
| Factor 3| CL2   | 1.192 | 0.13  | 8.955 | ***  | 0.810 |
|         | CL3   | 1.258 | 0.14  | 8.499 | ***  | 0.805 |
|         | CL4   | 0.957 | 0.14  | 6.725 | ***  | 0.605 |

Figure 2. First-order confirmatory factor analysis of interpersonal competence of CPMs

As shown in Table 5, the arithmetic square roots of the AVE values for all factors were significantly greater than the correlation coefficient between factors, which indicates that the discriminant validity of the scale was also good. Therefore, the three-dimensional structural model of the interpersonal competence of project managers established in this study was the best fitting model.

Table 5. Discriminant validity test

|         | Factor 1 | Factor 2 | Factor 3 |
|---------|----------|----------|----------|
| Factor 1| (0.707)  |          |          |
| Factor 2|          | (0.761)  |          |
| Factor 3| 0.601    | 0.652    | (0.729)  |

Finally, this dissertation conducts second-order confirmatory factor analysis. If the correlations among were high when validating the model through the first-order confirmatory factor analysis, then the common factors of higher orders were extracted by means of a second-order confirmatory factor analysis. The results are shown in Figure 3. The standardized path coefficients from the second-order factor to the first-order factors were 0.781, 0.770, and 0.848, which are all greater than the threshold value of 0.7, indicating that the internal quality goodness of fit of the second-order factor model was better. The other fit indices of the second-order factor model, which all meet the statistical requirements, were as follows: CMIN = 124.663, DF = 87, CMIN/DF = 1.433, RMSEA = 0.051, GFI = 0.911, and AGFI = 0.877.
Therefore, the competence related to application instrumental relationships and emotional relationships, and the competence related to handling interpersonal relationship conflicts hypothesized in this study could well converge to the high-level concept of interpersonal competence of project managers.

4. Management implications
This research has several implications for Chinese project managers: On the one hand, the scale of interpersonal competence of CPMs developed in this research can be directly applied to the assessment of project manager’s interpersonal competence and it can be clearly investigated and objectively measured; on the other hand, construction companies can develop training programs for project managers that focus on enhancing their competence related to application instrumental relationships, emotional relationships, and handling interpersonal relationship conflicts based on the performance of their interpersonal competence in each dimension of the scale.

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