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The structure and measurement of transformational leadership in China

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Abstract Using an open-ended questionnaire, this research firstly collects data from 249 managers and employees in various companies to identify behaviors and characteristics of transformational leadership in China. A content analysis reveals that transformational leadership includes eight specific categories in China. Then, transformational leadership questionnaire (TLQ) is developed in the second study by means of expert discussion. Exploratory factor analysis (EFA) of data from a sample of 431 employees shows that transformational leadership is a four-dimension construct in China, including moral modeling, charisma, articulate vision and individualized consideration. The third study further confirms TLQ's construct validity through confirmatory factor analysis (CFA) of data from another sample of 440 managers and employees. Internal consistency analyses and hierarchical regression analyses indicate that TLQ has sound reliability and concurrent validity.

Keywords transformational leadership, moral modeling, articulate vision, individualized consideration, charisma

摘要 采用开放式问卷对 249 名管理者与员工进行了调查。分析表明, 我国的变革型领导包括 8 类行为或特征。通过专家讨论, 编制了适合我国国情的变革型领导问卷。431 份有效问卷的探索性因素分析表明, 变革型领导是一个 4 因素的结构, 具体包括: 德行垂范、领导魅力、愿景激励与个性化关怀。为了进一步验证变革型领

Translated and revised from *Xinli Xuebao* 心理学报 (Acta Psychologica Sinica), 2005, 37(6): 803–811

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导的构想效度，并考察问卷的信度与效度，对6家企业进行了调查，获得了440份有效问卷。验证性因素分析证实了变革型领导问卷的构想效度，内部一致性分析与层次回归分析的结果也表明，基于我国文化背景新编的变革型领导问卷具有较好的信度与同时效度。

关键词 变革型领导，德行垂范，愿景激励，个性化关怀，领导魅力

1 Introduction

Transformational leadership has drawn academic attention over the past 30 years as a new paradigm for understanding leadership. According to Bass (1995), transformational leaders stimulate followers to realize the important meaning of the tasks they are responsible for, motivate their high level needs for growth and development, establish a climate of mutual trust, stir their employees to look beyond their own self-interests for the good of the group, and achieve performance beyond expectations. Bass developed an instrument to measure both transactional and transformational leader behaviors and to investigate the nature of the relationship between these two leadership styles as well as between work unit effectiveness and satisfaction. The resulting instrument, the multifactor leadership questionnaire (MLQ), was conceptually developed and empirically validated to reflect the complementary dimensions of transformational and transactional leadership with sub-scales to further differentiate leader behaviors (Bass and Avolio, 1996). Three of the five scales were identified and defined as characteristics of the transformational leadership, including charismatic-inspirational leadership, intellectual stimulation, and individualized consideration (Bass, 1985, 1995). Later, Bass et al. further divided Charismatic-Inspirational Leadership into two dimensions, namely charisma or Idealized Influence and inspirational motivation. Therefore, a four-dimension model came into being: charisma or idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass and Avolio, 1990; Bass and Avolio, 1996). The first two components represent the notion of “charisma” and are similar to behaviors specified in theories of charismatic leadership. Inspirational motivation includes the creation and presentation of an attractive vision of the future, the use of symbols and emotional arguments, and the demonstration of optimism and enthusiasm. Idealized influence contains behaviors such as sacrificing for the benefit of the group, setting a personal example, and demonstrating high ethical standards. The third component, individualized consideration, includes providing support, encouragement, and coaching to followers. The fourth component, intellectual stimulation, involves behaviors of increasing awareness of problems and challenging followers to view problems from new perspectives.

To date, Bass's four-dimension MLQ model has been widely accepted and used in transformational leadership research, and the model's construct validity and predicative validity were confirmed in a number of empirical studies (Avolio, Bass, and Jung, 1999; Bass, 1997; Bass and Avolio, 1996). However, its content validity and construct validity were questioned in other empirical studies (Carless, 1998; Den Hartog, Van Muijen and Koopman, 1997; Tejeda, Scandura and Pillai, 2001). For example, Carless undertook an Australian case to investigate the discriminant validity of transformational leadership behavior, as measured by the MLQ. On the basis of goodness-of-fit statistics to test various models, she concluded that the subscales of the MLQ are highly correlated, with a high proportion of variance of the subscales explicable by a higher-order construct, and thus, that 'there is little evidence to support the contention that MLQ measures distinct transformational leader behaviors' (Carless, 1998). In another case, using a Dutch translation of the instrument, Dutch researchers Den Hartog, Van Muijen, and Koopman, attempted to test the factor structure of the MLQ. They reported a structure comprising a transformational, a transactional, and a *laissez-faire* factor, but they did not separate dimensions of transformational and transactional leadership (Den Hartog et al., 1997). Tejeda, Scandura and Pillai tested the validity of MQL using four samples of managers, and the data failed to support the hypothesized structure of the MLQ. However, a reduced set of items from the MLQ appeared to show preliminary evidence of construct and predictive validity (Tejeda et al., 2001). Using a sample of 149 managers, Li and Shi tested MLQ's construct validity in China, but the result of confirmatory factor analysis (CFA) was not satisfactory (Li and Shi, 2003). Due to inconsistent results with MLQ, some scholars began to develop new transformational leadership questionnaires. For instance, Alimo-Metcalfe and Alban-Metcalfe redefined the dimension of transformational leadership through grounding technique in UK, and designed a new transformational leadership questionnaire, which was totally different from Bass's MLQ (Alimo-Metcalfe and Alban-Metcalfe, 2001).

Embedded in a social influence process, leadership exists all around the world. However, the notion and the construct may vary from one another through different cultures (Hofstede, 1993, 2000). With more than two thousand years a history, China possesses some unique traditions of her own. According to Hofstede (Hofstede, 1993), China is a country with high power distance, high collectivism, high concern of long-term result, and under deep influence of Confucianism which advocates social harmony and especially think highly of harmonious interpersonal relationship, even in the managerial process. Moreover, China is in a transitional period from a planned economy to a market economy. We may share many aspects of leadership process in common with the West, whereas China may have its own dynamics and characteristics owing to the existence of the cultural factors. This has been proved by some researches. For

instance, in testing PM theory, Ling, Chen and Wang identified another dimension, moral, which is unique in China (Ling, Chen and Wang, 1987; Ling, Chia, and Fang, 2000). Research conducted by Westwood (Westwood, 1997) and Cheng (Cheng, Chou and Farh, 2000) has demonstrated that, one unique style of Chinese enterprise leaders is paternalistic leadership. Shi, Wang and Li conducted a series of research on the competency model of managers in both domestic state-owned and private-owned enterprises (Shi, Wang and Li, 2002). Differences in competency models of domestic and western senior managers were also found in these studies. While recognizing and valuing the ground-breaking researches of Bass and his coworkers, and the wealth of other US studies, present studies are more concentrated on finding out whether dimensions of transformational leadership emerging from North American studies are similar to those found in Chinese organizations.

2 Study one: Results of inductive analysis on transformational leadership

This research adopts an emic and etic approach and the concept of transformational leadership is defined in the light of western research. Inductive method and emic approach are used to explore the aspects that make up of transformational leadership. Similar to the method used by Farh, Zhong, and Organ (Farh, Earley and Lin, 1997), an inductive approach to identify transformational leadership is used in this paper. This approach calls for gathering descriptions of concrete incidents from respondents and then classifying them into a number of categories by content analysis with an agreement index constructed using multiple judges. This inductive approach is particularly important in cross-cultural research where construct and measurement equivalence cannot be taken for granted.

Step one We presented respondents with a broad definition of transformational leadership based on Bass. To avoid potential biases from their responses, respondents were not provided with any sample items. Each respondent was asked to identify 5 to 6 behaviors and characteristics of managers consistent with the definition of transformational leadership based on their experiences and observations. To ensure the representativeness of sampling, the participants were drawn from seven cities in China, including Beijing, Hangzhou, Xi'an, Guangzhou, Shenzhen, Zhengzhou, and Chongqing. 249 respondents from a variety of industries and companies (to ensure variation) were involved in this study.

Step two The 249 respondents generated a total of 1 276 items (approximately 5.12 items per respondent). All items were transcribed into an

Excel file. The first author of this paper plus a Chinese Ph.D. student screened all items based on three criteria: (a) the item must have clear meaning in Chinese language; (b) the item must refer to managers' behavior or characteristic; and (c) the behavior or characteristic is not clearly the feature of transactional leader. In line with the three criteria, a total of 93 items (7.3%) were considered as "non-usable" and eliminated from the item pool.

The meanings of some items identified by the respondents are not univocal, and some items included two different meanings, or even three. Therefore, every item was fully discussed to judge whether it is univocal or not. The ambiguous items were further discussed and then treated by different ways. In order to keep one meaning for each item, some items were moderately adjusted or split. At last, 149 items with double meanings were identified and each was divided into two items, and 19 items with triplex meanings were divided into three separated items. As a result, a total of 1 370 items were collected, each of which had only a single meaning. The two-person screening panel then classified the 1 370 items into categories based on the similarity of item content. After several iterations, they agreed on an 8-category system, as showed in Table 1, which could classify all 1 370 usable items into mutually exclusive categories.

Table 1 Representative items of eight categories

Category name	Representative item
Impact of good examples	<ul style="list-style-type: none"> ◆ Lead one's men in an act, and set example to them ◆ Care about the influence of his words and deeds to employees ◆ Set oneself an example to others
Dedication	<ul style="list-style-type: none"> ◆ Give up one's own interests for the good of organization ◆ Work overtime regardless of rewards ◆ Sacrifice one's own interests at a crucial moment
Morality	<ul style="list-style-type: none"> ◆ Decent and selfless ◆ Appoint people by abilities, and never envy others' competency ◆ Deal with matters impartiality
Charisma	<ul style="list-style-type: none"> ◆ Devote to work, and always work passionately ◆ Be good at handling a Gordian knot, and face it bravely ◆ Be competent in operations
Articulate vision	<ul style="list-style-type: none"> ◆ Discuss future with employees optimistically ◆ Set goals and directions for employees ◆ Be confident for unit and organization's future
Intellectual stimulation	<ul style="list-style-type: none"> ◆ Open-minded, and full of innovation consciousness ◆ Encourage employees to find out solutions from multi-point of view ◆ Dissatisfy with the actuality, and get rid of the stale to bring forth the fresh
Individualized consideration	<ul style="list-style-type: none"> ◆ Adopt suitable management style according to employees' situations ◆ Be patient in coaching employees, and answer their puzzles ◆ Help to solve employees' difficulties in life and family

(To be continued)

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Category name	Representative item
High performance expectations	<ul style="list-style-type: none"> ◆ Solicit for employees' opinions on some important matters ◆ Encourage employees to take on tasks full of challenge ◆ Stimulate employees to set higher goals for themselves

Step three To test the reliability of our designated categories, three Chinese Ph.D. students were invited to serve as test judges. All judges went through a three-hour training session in which they were taught to be familiar with the definition of each category and then tried out some practice items. First, we asked the three judges to read the categories name and representative items carefully, and discuss these items fully with us. Then, eight items were picked out from each category, totally 64 items from eight categories, with which we trained the three judges to classify these items correctly into designated category. After training, another eight items were picked out from each category, totally 64 items, and assembled randomly. The three judges were asked to reclassify these items, and they were allowed to discuss during this process. We looked on and gave them some advices when necessary. Finally, 64 items were classified into designated category.

Upon completion of the training, the judges worked independently to classify the other 1 242 items into the 8 categories. Since each item in the pool was classified by three test judges independently, there were four possible outcomes: (a) full agreement—all three test judges classified the item correctly into its designated category; (b) two agreements—two of the three judges classified the item correctly; (c) one agreement; and (d) zero agreement. Table 2 shows that 71.6% of the items were classified exactly the same way as the researchers had intended, 13.9% had two agreements, and 14.6% had one or zero agreement. It means that 85.5% of the items (approximately 1 061 items) classified by two or more judges were exactly the same as the researchers'. The result confirmed the validity of the researchers' classification. Hereby, Chinese transformational leadership consists of eight categories of behaviors or characteristics, and they are leading by example, dedication, morality, charisma, articulate vision, intellectual motivation, individualized consideration, and high performance expectation.

Table 2 Consistency of classifications

Types	Items	Percentage (%)
Full agreement—All three test judges classified the item correctly into its designated category	889	71.6
Two agreements—Two of the three judges classified the item correctly into its designated category	172	13.9
One agreement—One of the three judges classified the item correctly into its designated category	139	11.2
No agreement	42	3.4

3 Study two: The development of transformational leadership questionnaire

3.1 Methods

3.1.1 The development of transformational leadership questionnaire

For each of the eight dimensions developed in the inductive research, the first author and a Chinese Ph.D. student compiled eight items for each dimension. In order to ensure the content validity, eleven professionals including the second author, three post doctors, three Ph.D. students, and four master students were invited to discuss each item according to the content of each dimension. First draft of transformational leadership questionnaire was compiled with six items remained in each dimension, considering the content validity, words description, and in consistency with the common usage. Six employees from some enterprises in Beijing were surveyed, and then interviews were conducted with these employees respectively to gain some advice. After several discussions, we had got the transformational leadership questionnaire with 48 items. Respondents were asked to indicate on a 5-point scale the extent to which the items had described the behavior or characteristic of their direct report. The scale ranges from 1 (strongly disagree) to 5 (strongly agree).

3.1.2 Research sample

Respondents in this study consisted of part-time graduates from several continuous education on human resource management or managerial training course, and employees from companies. All questionnaires were distributed and collected in class or during meeting. In total, 490 questionnaires were distributed out and 447 questionnaires were returned, 431 of which were valid after deleting those with too much blank or obvious bias. The respondents included 160 men (37.1%) and 237 women (55.0%); 197 (45.7%) of them were below 30 years old, 180 (41.8%) were from 31 to 40, and 22 (5.4%) above 41. 29 respondents (6.7%) had a college diploma or below, 254 respondents (58.9%) had bachelor's degree, and 121 respondents (28.1%) had higher degrees.

3.1.3 Procedures

All part-time graduates filled out the survey in class, and returned the questionnaire upon completion. Employees from companies, assembled by human resource departments, filled out the survey during meeting time and also

returned the questionnaire on the spot. It was assured that the results would be kept confidential and used only for research purpose. When all the questionnaires were returned, the invalid ones with too much blank were deleted. Statistic analysis was carried out thereafter.

3.1.4 Statistic analysis

Exploratory factor analysis (EFA) was used to determine the structure of the transformational leadership questionnaire. Besides, the Cronbach's Alpha of each dimension was also calculated. All statistic analyses were carried out with SPSS 11.0.

3.2 Results

3.2.1 Results of exploratory factor analysis (EFA)

Exploratory factor analysis (EFA) (principle component with varimax rotation) was performed to identify the dimensions of transformational leadership. Three criteria were used to judge whether an item should be retained: 1) Eigen value should be larger than 1; 2) items with high loadings (above 0.50); and 3) no high cross loadings (where the loading difference is larger than 0.35). Through several steps, a 4-factor construct of transformational leadership was obtained, accounting for 64.05% of the variance, with four Eigen values more than 1. Each item loaded highly on respective factors, ranging from 0.51 to 0.95, and there were no items with heavy cross loadings.

There were eleven items loading on the first factor, including dedication, setting oneself an example to others, sacrificing self-interests, doing what you promised, and being severe with oneself and lenient towards others and so on. We named this factor as moral modeling. There were eight items loading on the second factor, including depicting future for employees, making employees understand what is going on of this company or unit/department, setting objectives and pointing out direction for developing, interpreting the meaning of his work and so on. We named this factor as articulate vision. There were also eight items on the third factor, including competent in operations, open-minded, conscious in innovation, willing to make a hit in his career, devotion in his work, setting high level of working standard for oneself and so on. We named this factor as charisma. There were seven items loading on the fourth factor, including consideration for employees' actual situations, creating developmental environment for employees, caring about employees' development, family and life and so on. We named this factor as individualized consideration.

It should be noted that four categories in the inductive research, namely, dedication, leading of examples, high performance expectations and intellectual stimulation did not appear as specific dimensions in Study 2. There were several explanations for this. First, most items of dedication and leading of examples loaded on the factor of moral modeling, a few items of which either had high cross-loading or factor loading less than 0.50. Second, some items of intellectual stimulation loaded on the factor of charisma, some loaded on individualized consideration, others either with high cross-loading or factor loading less than 0.50. It seems that Chinese tend to perceive intellectual stimulation of leaders as charisma or intellectual stimulation from their leaders. Third, most items of high performance expectations had high cross loadings with other dimensions, except a few items loaded on articulate vision. All of the six items are ruled out throughout the EFA process. It seems that high performance expectation is not an independent dimension of transformational leadership in China.

To make the questionnaire more manageable for subsequent research, we constructed a 26-item transformational leadership questionnaire (TLQ), by selecting eight items for moral modeling, six items for charisma, articulate vision and individualized consideration with the highest factor loading from each factor. exploratory factor analysis (EFA) of data was conducted again to all the remaining items. Table 3 presents the EFA results of the transformational leadership questionnaire. Four dimensions with 26 items are obtained. Factor loadings with all the items are above 0.55. There are no items with heavy cross loadings. The four factors explain 65.64% of total variance. All of the internal consistent coefficients are above 0.86. These results indicate that the questionnaire has good reliability. In summary, through the inductive research and scale development study, a construct of transformational leadership with four dimensions is obtained, and the four dimensions are moral modeling, charisma, articulate vision, and individualized consideration.

Table 3 Results of EFA of transformational leadership questionnaire

Variables	Factor1	Factor2	Factor3	Factor4
Follows rules, be just, neither be corrupted nor for self-serving	0.92	-0.02	-0.04	-0.04
Works hard before enjoyment	0.90	0.07	-0.12	-0.05
Tries his/her best at work regardless of personal interest	0.89	0.02	-0.11	0.05
Go beyond self-interest for the good of the department/unit or the organization	0.86	0.08	-0.02	-0.02
Put one's own benefits after group's or organization's benefits	0.83	0.07	0.05	-0.08

(To be continued)

(Continued)

Variables	Factor1	Factor2	Factor3	Factor4
Never take the achievements of other peoples as his/her own	0.67	-0.07	0.12	0.09
Share achievements and sorrows in the work with his/her followers	0.65	-0.05	0.21	0.10
Never make things hard for his/her subordinates; never retaliate his/her subordinate by abusing his/her power	0.57	-0.17	0.30	0.23
Let his/her subordinate know the prospect of the department/unit	0.06	0.91	-0.17	-0.03
Let staff understand the management philosophy, visions and missions of the organization/department	-0.08	0.83	-0.05	0.15
Explain long-term meaning of the work to employees	0.07	0.82	0.06	-0.12
Depict a vivid future for employees	0.01	0.80	-0.09	0.04
Set goals and directions for employees	0.06	0.70	0.19	-0.03
Often analyze the impact of their effort on the goals of the department/unit with staff.	-0.09	0.56	0.32	0.08
Consider the real conditions of employees when contacts with them	-0.10	-0.01	0.89	-0.01
Be willing to help employees to solve difficulties in their life and family	0.05	-0.04	0.86	-0.14
Communicate with employees to know about their work, life and family	-0.03	-0.09	0.83	0.05
Be patient in instructing employees, and answer their puzzles	0.08	-0.03	0.66	0.08
Care employees' work, life and family, and give advices for their development	0.25	0.14	0.59	-0.05
Try his/her best to help and facilitate the employees to develop their strengths	-0.05	0.28	0.56	0.07
Be competent in operations	0.06	-0.15	0.02	0.82
Open minded and innovative	-0.21	0.11	0.07	0.81
Love his/her work, with strong enterprise and gumption	0.08	0.02	-0.10	0.80
Show high commitment to his/her work, keeps high levels of passion	0.15	-0.02	-0.04	0.74
Keeps learning for self-enhancement	-0.04	0.10	0.03	0.68
Good at and never hesitate to take action when dealing with tough problems	0.17	0.17	-0.08	0.55
Eigen value	12.39	2.26	1.35	1.08
Percentage of variance explained (%) (Accumulative variance is 65.64%)	47.65	8.69	5.17	4.14
Cronbach's Alpha	0.94	0.90	0.87	0.86

4 Study three: Validation of transformational leadership questionnaire

4.1 Methods

4.1.1 Measurement

Transformational leadership The transformational leadership questionnaire developed in Study 2 was used. Respondents were asked to indicate on a 5-point scale the extent to which the items had described the behavior or characteristics of their direct manager. The scale ranges from 1 (strongly disagree) to 5 (strongly agree).

Job satisfaction Job satisfaction was measured by a six item scale taken from Tsui, Edgan and O'Reilly Iii (Tsui, Egan and O'Reilly Iii, 1992) with some modification. A sample item was "I am satisfied with the pay I receive for my job". A 5-point response scale was used ranging from 1, "strongly disagree", to 5, "strongly agree". The alpha coefficient for this scale was 0.78.

Organizational commitment Organizational commitment was measured by a six item scale taken from Meyer and Allen (Meyer, Allen and Smith, 1993)'s affective commitment scale. A sample item was "I would be very happy to spend the rest of my career with the organization". A 5-point response scale was used ranging from 1, "strongly disagree", to 5, "strongly agree". The alpha coefficient for this scale was 0.78.

Turnover intention Turnover intention was measured by a three items scale taken from Chen, Hui and Sego (Xiaoping, Hui and Sego, 1998)'s turnover intention scale. A sample item was "I often think of leaving this organization". A 5-point response scale was used ranging from 1, "strongly disagree", to 5, "strongly agree". The alpha coefficient for this scale was 0.80.

Leadership effectiveness Leadership effectiveness was measured by a 9 items scale taken from Bass and Avolio (Bass & Avolio, 1996)'s MLQ. A sample item was "Is effective in meeting my job-related needs". A 5-point response scale was used ranging from 1, "strongly disagree", to 5, "strongly agree". The alpha coefficient for this scale was 0.88.

4.1.2 Research sample

Participants in this study were employees from six companies in China. All questionnaires were distributed and collected during meeting time. In total, 520 questionnaires were distributed out and 456 questionnaires were returned, 440 of

which were valid after deleting those with too much blank or obvious bias. The respondents included 207 men (47.0%) and 143 women (32.5%), 228 (51.8%) of which were below 30, 57 (13.0%) of which were from 31 to 40, and 28 (6.3%) of which were above 41. 196 respondents (44.6%) had a junior college diploma or below, 134 respondents (30.5%) had bachelor's degree, and 21 respondents (4.8%) had higher degrees.

4.1.3 Procedures

Employees from all companies, assembled by human resource departments, filled out the survey during meeting time and returned the questionnaire when completed. It was assured that the results would be kept confidential and used only for research purpose. When all the questionnaires were returned, the invalid ones such with too much blank were abandoned. Statistic analysis was carried thereafter.

4.1.4 Statistic analysis

Cronbach's Alpha, item-total correlation and the change of Cronbach's Alpha after deleting each item were used to analyze the reliability the scales, including articulate vision, moral modeling, charisma, and individualized consideration. Then, confirmatory factor analysis (CFA) was carried out using Amos 4.0. Finally, hierarchical moderated regression analysis was conducted to explore the influences of transformational leadership on job satisfaction, organizational commitment, turnover intention, and leadership effectiveness after demographical variables were controlled.

4.1.5 Hypothesized models

CFA method enables researcher to compare different models to find out which one fit the data better. In this research, we compare the four-dimension model with some other models to explore which model fit the data better. According to Study 1, transformational leadership is a four-factor construct in China. However, we also find that the four factors are interrelated to one another moderately. Is there a possibility that transformational leadership is a single-factor construct? Therefore, we would like to conduct a comparison between the single-factor model and the four-factor model to find out which one fit the data better. See Fig. 1 and Fig. 2 for the hypothesized single-factor model and the four-factor model.

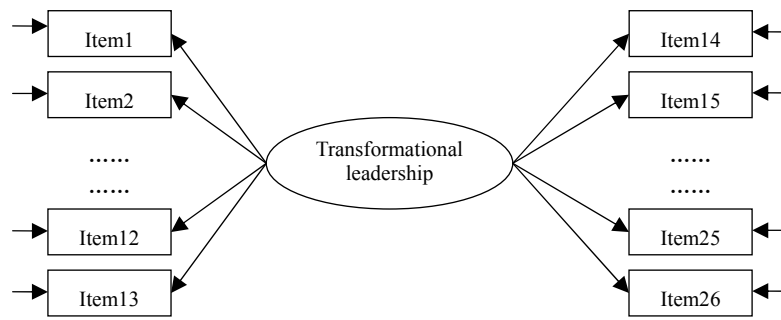


Fig. 1 Single-factor model

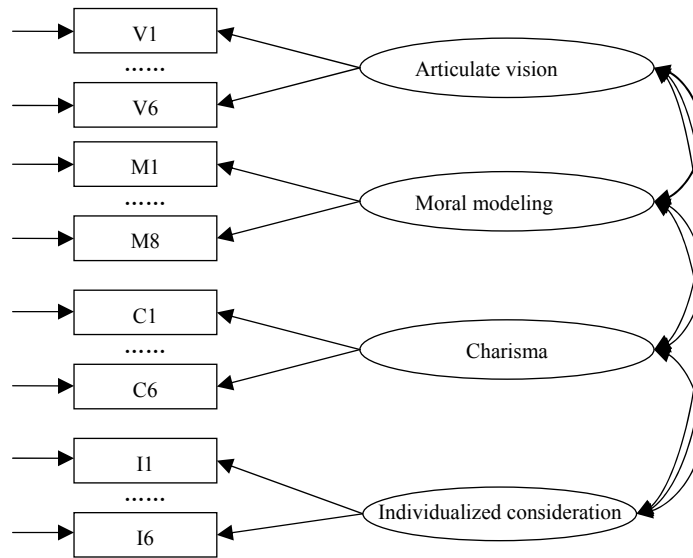


Fig. 2 Four-factor model

Note: V1 represents the first item of Articulate Vision; V2 represents second item; I1 represents the first item of Individualized consideration, the rest may be deduced by analogy.

4.2 Results

4.2.1 Item analysis and reliability analysis

Table 4 shows that Cronbach's Alpha of all dimensions range from 0.84 to 0.92, higher than the suggested value 0.70. All items are highly correlated with the total score, and Cronbach's Alpha would not increase when deleting any items. Therefore, the design of

the items of the transformational leadership questionnaire is sound and valid.

Table 4 Item analysis and reliability ($n=440$)

Item	Cronbach's Alpha	Interrelation to total	Cronbach's Alpha if item deleted
Articulate vision	0.88		
V1		0.70	0.86
V2		0.68	0.86
V3		0.70	0.86
V4		0.72	0.85
V5		0.66	0.86
V6		0.68	0.86
Moral modeling	0.92		
M1		0.73	0.91
M2		0.72	0.91
M3		0.73	0.91
M4		0.73	0.91
M5		0.71	0.91
M6		0.77	0.90
M7		0.68	0.91
M8		0.76	0.90
Charisma	0.84		
C1		0.68	0.80
C2		0.57	0.82
C3		0.71	0.79
C4		0.61	0.81
C5		0.60	0.81
C6		0.56	0.83
Individualized consideration	0.87		
I1		0.62	0.86
I2		0.76	0.83
I3		0.65	0.85
I4		0.70	0.84
I5		0.62	0.86
I6		0.67	0.85

Note: V1 represents first item of articulate vision; V2 represents the second item; I1 represents first item of individualized consideration; the rest may be deduced by analogy.

4.2.2 Results of confirmatory factor analysis

Table 5 Results of confirmatory factor analysis ($n=440$)

Model	χ^2	df	GFI	NFI	IFI	TLI	CFI	RMSEA
Null	7 276.28	325						
Single-factor model	1 575.87	299	0.71	0.78	0.82	0.80	0.82	0.10
Four-factor model	845.56	293	0.86	0.88	0.92	0.91	0.92	0.06

Table 5 presents the results of confirmatory factor analysis. Results show that each goodness of fit index of the four-factor model reaches or is close to a general rule of thumb, which means that the four-factor construct was supported by data. However, the goodness of fit index of the single-factor model neither reaches nor is close to a general rule of thumb.

Additionally, criteria used to assess a model include the loadings of observed variables on latent variables and on errors. Generally speaking, observed variables should load highly on latent variables and lowly on errors, which means a good model and the relation between observed variables and latent variables is reliable. Table 6 reports loadings of every item on related latent variables and errors in the four-factor model. The loading of every item on related latent variable is comparatively high, ranging from 0.62 to 0.81, which means that every observed variable accounts for related latent variable instead of error.

Table 6 Loading on latent variable and error in the four-factor model

Item	Articulate vision		Moral modeling		Charisma		Individualized consideration	
	loading	error	loading	error	loading	error	loading	error
item1	0.76	0.43	0.76	0.61	0.62	0.54	0.71	0.27
item2	0.75	0.42	0.77	0.48	0.64	0.39	0.73	0.28
item3	0.74	0.36	0.76	0.36	0.78	0.33	0.65	0.34
item4	0.76	0.32	0.80	0.34	0.67	0.48	0.75	0.32
item5	0.71	0.44	0.75	0.21	0.75	0.30	0.81	0.32
item6	0.73	0.38	0.76	0.32	0.68	0.40	0.71	0.26
item7			0.72	0.47				
item8			0.80	0.44				

Note: Item1 refer to the first item; Item2 refers to the second item; the rest may be deduced by analogy.

4.2.3 Results of hierarchical regression analysis of transformational leadership on criterion variables

Hierarchical regression method was used to explore transformational leadership's impact on job satisfaction, organizational commitment, turnover intention and leadership effectiveness. For each dependent variable (job satisfaction, organizational commitment, turnover intention and leadership effectiveness), we ran initial regressions with the control variables including sex, age, education, job category and job tenure. This procedure was followed by regression with only main effects entered. Table 7 shows that with demographic variables controlled, transformational leadership make new contribution to job satisfaction, organizational commitment, turnover intention, and leadership effectiveness, and

Table 7 Results of hierarchical regression analysis

Variables	Job satisfaction (β)		Organizational commitment (β)		Turnover intention (β)		Leadership effectiveness (β)	
	Step one	Step two	Step one	Step two	Step one	Step two	Step one	Step two
	1 Demographic variables							
Gender	0.06	-0.02	0.16	0.11	-0.22*	-0.17	0.09	-0.01
Age	-0.07	-0.04	0.11	0.14	-0.01	-0.04	-0.05	-0.02
Education	-0.19	-0.26***	-0.16	-0.20*	0.18	0.23*	-0.08	-0.15
Job category	-0.02	-0.02	0.12	0.19	0.06	0.03	-0.02	-0.06
Job tenure	0.17	0.12	0.08	0.00	-0.16	-0.11	0.11	0.07
2 Transformational leadership								
Morale modeling		0.20*		0.39**		-0.31*		0.07
Articulate vision		0.15		0.43**		-0.06		0.23*
Charisma		0.30**		0.03		-0.08		0.44***
Individual consideration		0.18		-0.26		-0.05		0.22*
<i>F</i>	1.35	12.28***	1.67	5.13***	2.33*	4.14***	0.46	28.62***
<i>R</i> ²	0.07	0.57	0.09	0.35	0.12	0.31	0.03	0.75
ΔR^2	0.07	0.49***	0.09	0.26***	0.12*	0.19***	0.03	0.72***

Note: *** indicates significant at level 0.001, ** indicates significant at level 0.01, * indicates significant at level 0.05.

the variances transformational leadership accounts for increased 49%, 26%, 19%, and 72% respectively. The results demonstrate that transformational leadership has significant influence on these criterion variables. Besides, moral modeling and charisma are positively related to job satisfaction. Moral modeling and articulate vision are positively related to organizational commitment. Moral modeling is negatively associated with turnover intention. Moral modeling, charisma and individualized consideration positively related to leadership effectiveness. None dimensions of transformational leadership has significantly influence on all criterion variables at the same time, but every dimension of transformational leadership would significantly influence at least one criterion variable. The results demonstrate the discriminant validity and predictable validity of transformational leadership from another perspective.

5 Conclusion and discussion

By adopting the inductive methods, we explored the structure of transformational leadership in China. Results show that transformational leadership is a four-factor construct under the context of Chinese culture, including articulate vision, charisma, moral modeling, and individualized consideration. Bass et al. suggested transformational leadership as a four-dimension construct, include charisma or idealized influence, inspirational motivation, individualized consideration, intellectual stimulation (Bass, 1985; Bass and Avolio, 1996). There are similarities, as well as differences, between our transformational leadership structure and Bass's. Regarding the connotation of four factors in this research, charisma and articulate vision in this research are approximately consistent with Bass's charisma and inspirational motivation. The connotation of individualized consideration in this research is more extensive than Bass' individualized consideration, for Bass' individualized consideration emphasized attention to employees' work and individual development, however, in our research, individualized consideration focus not only on work and individual development, but also on employees' family and life. Difference in considerations for employee between China and western managers is indicated clearly: western managers pay more attention to employees' work category, while their Chinese counterparts pay more attention to their employees' family and life besides work itself. Also, in the west, managers tend not to care about employees' family and life which are considered to be private, while in China, managers tend to care about employees' family and life more comprehensively and considerately. In this study, moral modeling is the unique dimension of transformational leadership in China. There are some characteristics in China's culture background accounting for the differences in the structure of

transformational leadership between China and the West. Confucius believed that fostering individual's personality and virtue are the foundation of a society. From a government's point of view, the ethics and modeling effects of superior emphasized by Confucius, and moral principles are used to educate and influence civilians, so that they can be sincerely convinced. Therefore, the best method of governing a country is to set oneself up as a role model for the people, and exert an implicit influence on them. In an ordinary organization, managers should set themselves up as role models for employees, and exert an implicit influence on them, in order to achieve organization's goal and vision. Findings of this research demonstrate Hofstede's point of view again which regards leadership as a social influence process and a ubiquitous phenomenon in every country all around the world, though both of the concept and structure vary with difficult cultures (Hofstede, 1993, 2000). What deserves more attention is the substantial difference in the structure of transformational leadership between West and China, because transformational leadership in China is influenced by cultural background.

Transformational leadership questionnaire was developed in our research through expert discussion. The results of primary exploratory factor analysis (EFA) indicate that transformational leadership is a four-factor construct, including articulate vision, charisma, moral modeling, and individualized consideration. The reliability of every dimension exceeds 0.70. Item analysis further demonstrates that every item of transformational leadership questionnaire highly correlates to the total, and that Cronbach's Alpha would not increase when deleting any items. Therefore, the design of transformational leadership questionnaire is sound and valid. The results of confirmatory factor analysis (CFA) show that four-factor structure is better than single-factor structure, and observed variables load heavily on latent variables while load little on errors, which further confirms the four-factor-construct structure of transformational leadership. The results of hierarchical regression analysis of transformational leadership on criterion variables show significant influences on job satisfaction, organizational commitment, turnover intention, and leadership effectiveness. Furthermore, different dimensions of transformational leadership do not have the same influence on criterion variables, which demonstrates the discriminant validity and predictable validity of the transformational leadership questionnaire.

As above, we find that transformational leadership in China is a four-dimension construct, and transformational leadership questionnaire is a reliable questionnaire with good reliability and validity. The examination of this construct in China and the development of corresponding measurement will thus have important significance for future theoretical and practical researches.

Acknowledgements This work is supported by the National Science Foundation of China

(No. 70471060 and No. 70502022).

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