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How Do Paternalistic and
Transactional Leadership Influence
the Behavioral Integration of Top
Management Teams in Megaprojects?

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How do paternalistic and transactional leadership influence the behavioral integration of top management teams in megaprojects?

Abstract: Following the call to investigate whether the leadership theory could be applicable in temporary organizations, this research examined the associations among paternalistic leadership, transactional leadership, and top management team (TMT) behavioral integration (BI) in megaproject settings. In addition, a TMT member's trust in leader is proposed as a social exchange mechanism through which paternalistic and transactional top leader exert influence on TMT' BI. The model is tested based on data collected from a sample of 177 TMT members working in megaprojects. Transactional and moral leadership can significantly stimulate the BI of TMT. While authoritarian leadership negatively influences the BI of TMT. Benevolent leadership does not have a significant impact on behavioral integration. Furthermore, The mediating role of trust in leader and moderating effect of power distance have been demonstrated. These findings contribute to literature by extending the extant paternalistic and transactional leaderships approaches in the context of temporary organization, and by broadening the leadership research in conjunction with social exchange and path-goal theories.

1 Introduction

In the engineering sector, megaprojects refer to large-scale infrastructure projects, such as convention & exhibition centers, dams, airports, bridges, urban metro systems, and high-speed railways (Locatelli et al., 2017). They provide fundamental public services for social production, economic development, and daily life (Flyvbjerg, 2014, 2017). Noteworthy, as a complex system, megaprojects have been described as the “beasts” in the realm of project management (Zidane et al., 2013). To control these “beasts”, the government usually sets up special purpose vehicles (SPVs) to deliver megaprojects, such as Hong Kong-Zhuhai-Macao Bridge Authority and London Olympic Games Organizing Committee. This kind of organizations acts as the project management entity on behalf of the government. Senior managers in the SPVs form the megaproject's top management teams (TMTs). They play a pivotal role in strategic decision-making coordination and management (Lundrigan et al., 2014). In this case, the behavioral integration (i.e., cooperative behavior, information exchange and joint decision) of

TMTs is especially crucial (Luo et al., 2018). Behavioral integration (BI) reflects the process of team operation from a holistic view. A series of researches show that TMT BI has significantly positive impact on organizational variables. Specifically, the BI helps to improve the dual abilities of the organization (Carmeli and Halevi, 2009). TMTs with high BI can adapt to the changing competitive environment quickly, and ultimately improving the performance of the organization (On et al., 2013). BI has direct and indirect effects on preventing organizational decline (Lubatkin et al., 2006; Carmeli and Schaubroeck, 2006).

On this basis, scholars show great interest in exploring the antecedent of BI so as to facilitate business success. Carmeli and Shteigman (2010) revealed the significant positive correlation between the shared vision and TMTs' BI from the perspective of social cognition. Simons and Peterson (2007) noted that there is a strong correlation between high trust among TMT members and their BI. Simsek et al. (2005) argued that the demographic characteristics of TMTs play an explanatory role in the level of BI. Furthermore, some scholars shifted to the perspective of leadership. Zhang et al. (2013) and Luo et al. (2016) analyzed the influence of CEO narcissism and dual leadership on TMTs' BI. Top leader and TMT are key factors (Zhang et al., 2015). Top leader, the most powerful and influential individual in TMT, has the most important and direct influence on TMT's BI (Ling et al., 2008). The behavior of TMT is under a certain team structure and organizational context, which is affected by value system, behavior rules, power distribution and resource distribution (Li and Jones, 2018; Cruz et al., 2010). As the designer of an organization, besides of daily affairs, one of the most important roles of the top leader is to build an institutional architecture that can provide the organization as many opportunities as possible to gain creativity, adaptability and responsiveness. Although extant studies has given us a clear understanding of the underlying mechanisms of the leadership process, most of these are conducted within permanent organizational structures and assume that leader-follower relationships are stable (Antonakis et al., 2003; Shamir, 2011). When the leader-follower relationship is unstable, things may change. For example, Bakker (2010) argued that transformational leadership was not applicable in unstable context. Temporary organization, defined as "a group of organizational actors working together to complete a complex task in a limited period (Bakker, 2010)", is considered to be an increasingly common form of organization due to the current 'rapidly changing' environment (Lundin and Steinthórsson, 2003). Megaproject TMTs are a

typical form of temporary organization in which TMT members are seconded by their affiliated organizations as they carry out project-oriented tasks. The leader-follower relationship between a top leader and his/her subordinates (i.e. TMT members) may only last for a very limited period of time. Even for long-operating projects (e.g. bridges, high-speed railways, nuclear power plants), member mobility is also high. Therefore, the leadership of the TMT needs to be further researched.

It is noteworthy that the influence of traditional transactional leadership on BI is still mixed. Some of studies indicated that transactional leadership, which emphasizes contingency incentive, has a positive impact on the behavior of organizational members (Bass et al., 2003; Walumbwa et al., 2008). Nguni et al (2006) said transactional leadership plays a positive role in promoting the organizational citizenship behavior of TMT members. While some studies (Pieterse et al., 2010; Rank et al., 2009) argued that transactional leadership has a negative impact on organization behaviors. Therefore, it is a mixed result whether transactional leadership is beneficial to BI. Specific management context need to be considered. In addition, we noted that a large number of megaprojects have been built in developing countries, such as India and China (Callegari et al., 2018). The influences of paternalistic leadership with oriental characteristics should not be ignored. Similarly, there is also a mixed view on paternalistic leadership. Camelo et al. (2015) and Chen et al. (2014) revealed that benevolent and moral leadership can stimulate team members' deep identification and facilitate their decision-making. Authoritarian leadership is not beneficial to information exchange, integration and innovation within the team. Meanwhile, Lu (2013), Vandev eer (2014), and Aycan (2015) argued that moral and benevolent leadership are actually oppression and exploitation rather than care and authorization, which is not beneficial to enhancing members' enthusiasm for cooperation. Authoritarian leadership helps to improve team creativity and psychological authorization. Thus far, the influences of these two leaderships on the BI of TMTs are largely unexplored in the realm of megaprojects. Therefore, we put forward the following question:

How do paternalistic and transactional leaderships influence TMTs' BI in megaproject?

Besides, affected by relationalism, social exchange theory and the reciprocity principle play an important role. Trust is the basis of social exchange (Chen et al., 2014). A high degree of trust in leader will strengthen the sense of responsibility of TMT members (Wang et al., 2012). It is not

clear that trust in leader can play a "bridge" role between leadership and BI. At the same time, the path-goal theory of leadership behavior holds that context factors such as the characteristics of team members can affect the motivation process of leaders (Chih et al., 2018). Thus, the value orientation of TMT members cannot be ignored. Among them, the value of power distance is widespread in the organizations (Tuuli et al., 2013; Al-Bayati et al., 2016). This value can improve team cohesion and execution. But at the same time, it also brings about problems such as power and responsibility imbalance, abusing power for personal gain and rigid management (Chang, 2013; Qian, 2013; Tabish and Jha, 2012). Thus, it is also worth to pay attention whether the differences in the values of power distance among the TMT members will affect their responses to the leadership style.

2 Theoretical Foundation and Hypotheses

BI is an aggregation concept aiming to integrate many factors in team process researches (Hambrick, 2007). Cooperative behavior focuses on the spontaneous mutual help among TMT members, rather than merely obeying or solving problems independently. Information exchange reflects the degree to which team members actively share information. Joint decision-making refers to the collective decision-making after full discussion among TMT members.

2.1 Leadership and BI

Paternalistic leadership

Authoritarian leadership refers to emphasis on the absolute authority and strict control of a leader. Detert and Edmondson (2011) put forward that authoritarian leaders inhibit the enthusiasm of TMT members to express their opinions and thus reduces the information transmission among them. Hahn et al. (2014) found that to some extent, centralization by top leaders could only reflect their own thoughts. Compared with small or middle size projects, megaprojects have more complex management contents. They are much more dependent on teams than individuals (Chih et al., 2018). If leaders over-emphasize their authority, TMT members would have no enthusiasm to express their opinions. It will bring about the superficial high efficiency—otherwise known as “false consistency”. Based on this, we proposed the following hypothesis:

H_{1a}: Authoritarian leadership negatively influences TMT BI in megaproject.

Benevolent leadership refers to comprehensive and long-term care for subordinates and their

families (e.g. personal care, consideration, tolerance) of a leader. Benevolent leadership is more tolerant of differences and conflicts. TMT members are brave to express their opinions and contribute their wisdoms in the decision-making process (Chan et al., 2013). In megaprojects, as an emotional incentive, benevolent leadership can effectively make up for the defect of lacking incentive means (Rezvani et al., 2018). When feeling special care from the leaders, TMT members can get psychological satisfaction, have more dependence on the temporary organization (i.e. TMT) and integrate into the team more quickly. Therefore, we proposed the following hypothesis:

H_{1b}: Benevolent leadership positively influences TMT BI in megaproject.

Moral leadership emphasizes the personal integrity and virtue of a leader. Leaders gain recognition and respect from TMT members by setting an example and developing ethics. As a temporary organization, the megaproject TMTs lack perfect rules to restrict the behavior of TMT members and protect their rights and interests (Li et al., 2018). Moral leader does a good job in resource allocation, policy making, and reward & punishment implementation. TMT members can feel high organizational justice, and then put more energy into the work (Özbek et al., 2016). TMT members internalize organizational goals into their own goals. They are more willing to express opinions when make decisions and cooperate with others (Farh et al. 2000). Davis and Rothstein (2006) also pointed out that there is a significant positive correlation between members' perception to the top leader's moral level and their loyalty to the organization. Thus, we proposed the following hypothesis:

H_{1c}: Moral leadership positively influences TMT BI in megaproject.

Transactional Leadership

Transactional leadership focuses on contingent reward and management by exception. It is similar to an exchange process for fulfilling contractual obligations (McCleskey, 2014). In other words, transactional leaders focus on establishing a "effort-reward" relationship. By setting goals for TMT members and notifying them rewards or punishments in advance, TMT members' behaviors can be motivated and constrained. Such incentives and constraints are applied externally, rather than internally (Herrmann, 2014). By defining the tasks and clarifying the responsibilities, transactional leadership can positively promote the cooperative behavior of TMT members. To sum up, in essentially, transactional leadership relies on rewards to motivate organizational members to work hard to achieve the expected goals. There is one thing needs to be clear.

Transactional leadership brings more quantitative rather than qualitative behaviors. It is a short-term incentive. Besides, transactional leaders focus on the problems and details in daily work. In the implementation of megaprojects, they take corresponding measures to correct the wrong attitudes and behaviors of TMT members. TMT members are less constrained. They have more freedom in daily management, and thus prefer to take part in teamwork. Therefore, we proposed the following hypothesis:

H₂: Transactional leadership positively influences TMT BI in megaproject.

2.2 Leadership and trust in leader

Trust in leader refers to the voluntary acceptance of leader behaviors by TMT members. In megaprojects, in the face of complex external environments and arduous work tasks, TMT members depend on interpersonal relationship to get guidance (Mazur and Pisarski, 2015), and the quality of interpersonal relationship mainly depends on the degree of trust (Lee et al., 2018). Authoritarian leader maintain their own authority through the exclusive power to win the obedience of TMT members. But such obedience is just a kind of forced control, a psychological state of "have to obey" (Ju et al., 2008). Therefore, the authoritarian behavior of the top leader will reduce trust in the leader of TMT members. Benevolence is basically the same as goodwill. The core content is the good intention of showing care and kindness to other TMT members, rather than using their vulnerability to damage. Thus, benevolent leadership can cultivate the trust of TMT members to their leader (Chen et al., 2014). Moral leadership means that top leader has a high level of personal integrity and self-cultivation. Thus he/she can gain the respect of TMT members. High morality not only means the integrity of the top leader, but also the consistency of his/her words and actions. These behaviors can naturally increase the trust in leader of members. For transactional leadership, goals and a series of rewards are identified at the beginning of the job. This kind of stimulus is very straightforward, and TMT members get positive feedback when they complete the tasks. Instant interactions enhance trust in leader of TMT members (Asencio, 2016). Based on these, we proposed the following hypotheses:

H_{3a}: There is a negative correlation between authoritarian leadership and trust in leader.

H_{3b}: There is a positive correlation between benevolent leadership and trust in leader.

H_{3c}: There is a positive correlation between moral leadership and trust in leader.

H_{3d}: There is a positive correlation between transactional leadership and trust in leader.

2.3 Trust in leader and BI

Trust is closely related to team effectiveness. If TMT members trust their top leader, they are willing to abide the organization norms and requirements, and maintain resources exchange relation positively (Dirks and Ferrin, 2002). If not, they may feel under manipulation. This will not only reduce their behaviors such as information exchange, joint decision-making, but also produce selfish behaviors to protect themselves. Bligh et al. (2006) pointed out that good interpersonal relationship is an important factor of TMT integration. Trust in leader can better promote the formation of a good atmosphere within the TMT. Chan et al. (2014) also proposed that different types of trust have different effects on outcome variables. Trust in leader has a greater impact on team performance than cognitive trust. The megaproject TMT is a kind of small social network. From non-acquaintance to solidarity and cooperation between TMT members, interpersonal relationship plays a very important role. As a psychological representation, trust in leader plays a prominent role between top leader and members. Therefore, we proposed the hypothesis:

H₄: There is a positive correlation between trust in leader and BI.

2.4 The mediating effect of trust in leader

Trust in leader is a cognitive response produced after interpersonal interaction between TMT members and top leader, and trust is the basis of social exchange. The level of trust in leader of TMT members affects their later behaviors (Moriano et al., 2014). The concern shown by the benevolent leader to individual TMT member is likely to bring him/her a strong sense of trust. This emotion will constantly strengthen the relationship between them. TMT member would like to show more energy than his/her duty (Colquitt et al., 2007). Similarly, moral leadership will form a good atmosphere within the TMT. It can provide a basis for building good interpersonal relationship. When leader's behaviors under high ethical standards, TMT members will be more inclined to trust their leader. They see him/her as model, and thus put more energy into their work. Both benevolent and moral leadership are trustworthy behaviors. These behaviors can enhance the interaction between top leader and TMT members. When the leader shows benevolence and morality and establishes trust between him/her and TMT members, the two sides will no longer be a simple contractual relationship, but a group with common values. TMT members are willing to make contributions to the team (Walker, 2013). In contrast, authoritarian leader usually forces

TMT members to contribute to the team (Wu et al., 2002). The behaviors of TMT members are mostly driven by pressure rather than initiative. They will produce the sense of distrust and resistance, which inhibits the BI of the organization. For transactional leadership, when TMT members gain rewards for the first time, their sense of trust to leader can be stimulated. They are more convinced that their contributions will be reciprocated and then would like to make more efforts. Therefore, Team behaviors of TMT members are based on trust in leader (Afshari and Gibson, 2016). The following hypothesis was proposed:

H₅: Trust in leader plays an intermediary role between leadership style and BI.

2.5 The moderating effect of power distance

Power distance is one of the important dimensions of cultural value. It refers to the acceptance of unequal distribution of power by social or organizational members. TMT members with low power distance believe that leaders and subordinates should be in an equal position. They have a strong sense of participation and expect interpersonal interaction with top leader. TMT members with high power distance are easy to accept the unequal power distribution between top leader and TMT members. They are accustomed to accept the orders from their leader and follow their leader to complete the tasks (Koslowsky et al., 2011). In megaprojects, if TMT members have high power distance, they think it is normal for the leader to have absolute authority. On the one hand, they are more willing to accept the care of benevolent leader, and more likely to imitate the style of moral leader, so as to strengthen their willingness to cooperate and improve their confidence in work (Schaubroeck et al., 2007). On the other hand, they show huge respect for authority, adopt a tolerant attitude towards authoritarian leader, and are more likely to accept their authoritarian behaviors (Sagie and Aycan, 2003). When the construction tasks are clear, TMT members will ignore the collective discussion and carry out the task assigned by the top leader directly. For transactional leadership, what leader praises highly is an equal cooperation atmosphere. The hierarchical relationship is weakened and replaced by the cooperative relationship. Top leader set tasks and clears rewards. TMT members complete tasks and get rewards. Thus, for TMT members with low power distance, this kind of leadership style has strong guidance and gives them a high degree of freedom, which is more conducive to show their talent (Tyler et al., 2000). But for TMT members with high power distance, they tend to follow leader's step. They are not adapted to the characteristics of equal cooperation and clear rewards & punishments (Erkutlu and Chafra, 2016).

Based on these, we proposed the following hypotheses:

H_{6a}: The higher the power distance of TMT members, the weaker the negative influence of authoritarian leadership on BI.

H_{6b}: The higher the power distance of TMT members, the stronger the positive influence of benevolent leadership on BI.

H_{6c}: The higher the power distance of TMT members, the stronger the positive influence of moral leadership on BI.

H_{6d}: The higher the power distance of TMT members, the weaker the positive influence of transactional leadership on BI.

Based on the above theoretical analysis, we proposed an empirical research framework among leadership, trust in leader and BI in TMT (figure 1).

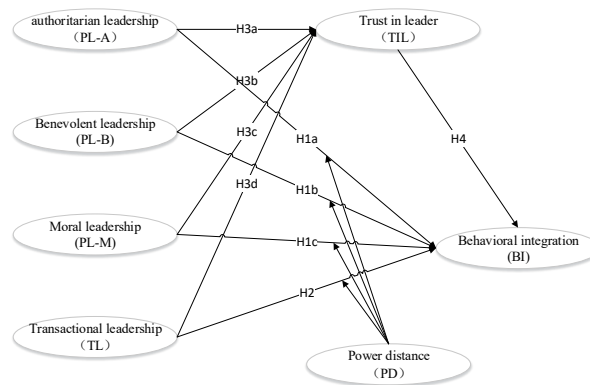


Fig 1. Theoretical model of leadership on BI

3 Research Method

3.1 Measuring tool

We used questionnaire to collect data. Following the suggestions of Wang et al. (2018), we used three steps to ensure the reliability and validity of the questionnaire. First of all, we designed an interview outline based on the systematic review of megaproject, TMT and leadership literature. Then semi-structured interviews were conducted to refine the scope of the study and further improve the questionnaire design. A total of five experts participated in semi-structured interviews. To ensure the quality of the interview, all respondents required at least five years of megaproject work experiences (Le et al., 2014a). Two of them are university professors, two are government officials, and the other is working in a state-owned enterprise.

Based on the research of Farh et al. (2008), the scale of paternalistic leadership had 10 items,

including 4 items of authoritarian leadership, 3 items of benevolent leadership and 3 items of moral leadership. According to the scale used by Hartog et al. (1997), transactional leadership was measured in two dimensions (i.e. contingent reward and management by exception) through four items. The scale of trust in leader mainly referred from Bakker et al. (1990), with a total of 3 items. The scale of TMT BI was derived from Simsek et al. (2005), including six items of cooperative behavior, information exchange and joint decision-making. Power distance adopted the scale from Dorfman and Howell (1988), with a total of 4 items. In order to minimize the common method variance of self-reported questionnaires, TMT members evaluate the leadership style of top leaders, and top leaders and TMT members evaluate the trust in leader and BI. All measures (as shown in Appendix) were rated using a 5-point Likert scale ranging from "strongly disagree" to "strongly agree".

3.2 Sample selection and data sources

According to wang et al. (2018), we defines megaprojects as large-scale infrastructure projects with a total investment of more than 1 billion Yuan and a significant impact on social production, economic growth, people’s life and natural environment. From May to September 2018, with the assistance of the Research Institute of Complex Engineering& Management and Tongji University 55 megaprojects TMTs were surveyed through online and offline questionnaires. A and B questionnaires were issued for each megaproject, which will be filled by top leader and TMT members respectively. A total of 270 questionnaires were distributed and 217 questionnaires from 46 teams were collected, with an effective recovery rate of 80.37%. Some questionnaires were deleted based on three principles. (1) In addition to personal data, the rate of missing answers should not be more than 10%. (2) Each TMT must have two levels of data from top leader and TMT members. (3) Each TMT must have one questionnaire for top leader and two or more questionnaires for TMT members. Finally, the effective samples for statistical analysis were 177 questionnaires (43 from top leaders and 134 from TMT members) from 43 TMTs. The final effective response rate was 65.56%. The basic statistical characteristics of the samples were shown in table 1.

Table 1. Demographics of surveyed projects and respondents

Variables	Category	Number	Percentage (%)
Age (years)	26-30	32	18.1
	31-40	47	26.6

	41-50	53	30.8
	Over 50	45	25.5
Types of respondent	Leading Group/Committee	48	27.1
	SPV		
	Headquarter	79	44.6
	Authorities	50	28.2
Project type	Transportation junction	37	20.9
	Highway	29	16.4
	Long-span bridge	22	12.4
	Railway	35	19.8
	Convention & exhibition center	54	30.5
Project location	North China	51	28.8
	East China	47	26.6
	South China	41	23.2
	Central China / West China	38	21.4
Years of experience	1-5 years	33	18.6
	6-15 year	85	48
	More than 15 years	59	21.4

4 Data analysis and results

4.1 Factor Analysis

We used exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to test the reliability and validity of the measurement model. EFA was used to identify potential dimensions of construction, and CFA was used to validate the results of EFA (Wang et al., 2018).

First, EFA was conducted for the fourteen items of leadership style. The Kaiser-Meyer-Olkin (KMO) value was $0.799 > 0.6$, and the p value from Bartlett test was $0.000 < .001$, indicating that the correlation coefficient between variables met the requirement of factor analysis (Field, 2009). Consequently, four factors were extracted to reflect the PL-A, PL-B, PL-M and TL constructs, respectively. Table 2 showed that the rotated loadings of each item were greater than 0.6 (Flynn et al., 1994), and the cumulative contribution rate of factor analysis was 77.308%. This validated the appropriateness of using fourteen items to reflect PL-A, PL-B, PL-M and TL. Second, CFA was performed to further verify the four-factor structure of leadership style using AMOS. Table 3 indicated that the factor structure of leadership style had a good adaptability (Wang et al., 2018).

Table 2. Component list of leadership practices

Measurement items	Factor loadings			
	Factor 1	Factor 2	Factor 3	Factor 4
PL-A 1	.826			
PL-A 2	.946			
PL-A 3	.734			
PL-A 4	.756			
PL-B 1		.875		
PL-B 2		.640		

PL-B 3			.635	
PL-M 1			.846	
PL-M 2			.666	
PL-M 3			.707	
TL 1				.917
TL 2				.888
TL 3				.662
TL 4				.704
Variance explained (%)	23.121	20.103	17.833	16.251
Variance cumulatively explained (%)	23.121	43.224	61.057	77.308

Table 3. Overall Goodness of Fit of CFA

Categories of statistics	Statistics	Fitness criteria	Social capital	
			Values	Fitness judgment
Absolute fit indices	RMR	< 0.05	0.017	Yes
	RMSEA	< 0.08	0.066	Yes
	GFI	> 0.90	0.957	Yes
	AGFI	> 0.90	0.941	Yes
	NFI	> 0.90	0.922	Yes
Incremental fit indices	IFI	> 0.90	0.976	Yes
	TLI/NNFI	> 0.90	0.958	Yes
	CFI	> 0.90	0.991	Yes
Parsimonious fit indices	PGFI	> 0.50	0.633	Yes
	PNFI	> 0.50	0.527	Yes
	PCFI	> 0.50	0.685	Yes

Note: RMR = Root mean square residual; RMSEA = Root mean square error of approximation; GFI = Goodness-of-fit index; AGFI = Adjusted GFI; NFI = Normed-fit index; IFI = Incremental fit index; TLI = Tucker-Lewis index; CFI = Comparative fit index; PGFI = Parsimonious GFI; PNFI = Parsimonious NFI; PCFI = Parsimonious CFI; AIC = Akaike information criterion; CAIC = Consistent version of AIC.

4.2 Evaluation of the measurement models

Before the hypotheses test, it is necessary to confirm that the variables have been correctly defined and measured. Therefore, Smart PLS 2.0 was used to analyze the reliability and validity of the measurement model (Hair et al., 2014). Reliability analysis was mainly used to test the internal consistency of the indicators. Table 4 and 5 showed that composite reliability (CR) of all constructs were greater than 0.7 and factor loadings were in the range of 0.610 - 0.889 (greater than 0.6), indicating that the scale had a high level of reliability. The validity test includes convergent and discriminant validity. According to the results shown in table 4 and 5, average variance extracted (AVE) of all constructs were greater than the minimum requirement of 0.5, indicating that the corresponding scale had satisfactory convergent validity. The discriminant validity was confirmed in two aspects. First, the square root of AVE for each construct in the

diagonal was greater than its highest off-diagonal correlation with any other constructs. Second, each item loaded onto a construct was higher than any of its cross-loadings with other constructs (Gefen and Straub, 2005).

Table 4. Measurement validity and construct correlations

Construct	CR	AVE	Correlation matrix							
			PL-A	PL-B	PL-M	TL	TIL	BI	PD	
PL-A	0.843	0.575	0.86							
PL-B	0.806	0.583	0.49	0.76						
PL-M	0.788	0.556	0.07	0.03	0.75					
TL	0.810	0.587	0.06	0.06	0.10	0.77				
TIL	0.761	0.517	0.36	0.15	0.27	0.28	0.94			
BI	0.886	0.565	0.43	0.37	0.45	0.46	0.22	0.75		
PD	0.896	0.684	0.46	0.35	0.30	0.47	0.34	0.34	0.82	

Table 5. Cross loadings for measurement items

Code	Item loadings						
	PL-A	PL-B	PL-M	TL	TIL	BI	PD
PL-A 1	0.741	0.228	0.187	0.245	0.471	0.185	0.253
PL-A 2	0.885	0.501	0.471	0.207	0.111	0.259	0.305
PL-A 3	0.717	0.414	0.318	0.318	0.319	0.351	0.376
PL-A 4	0.676	0.483	0.248	0.452	0.102	0.203	0.450
PL-B 1	0.471	0.838	0.362	0.428	0.334	0.145	0.282
PL-B 2	0.440	0.773	0.539	0.364	0.539	0.386	0.247
PL-B 3	0.284	0.671	0.424	0.411	0.271	0.244	0.358
PL-M 1	0.329	0.344	0.610	0.306	0.505	0.458	0.523
PL-M 2	0.168	0.281	0.819	0.507	0.268	0.100	0.179
PL-M 3	0.264	0.102	0.792	0.278	0.271	0.389	0.109
TL 1	0.472	0.211	0.507	0.733	0.299	0.256	0.535
TL 2	0.418	0.259	0.424	0.875	0.437	0.369	0.233
TL 3	0.327	0.214	0.272	0.889	0.340	0.193	0.472
TL 4	0.416	0.293	0.122	0.738	0.227	0.183	0.477
TIL 1	0.211	0.252	0.210	0.495	0.828	0.359	0.220
TIL 2	0.159	0.134	0.264	0.334	0.745	0.387	0.337
TIL 3	0.220	0.487	0.137	0.280	0.722	0.106	0.453
BI 1	0.290	0.517	0.515	0.138	0.228	0.761	0.191
BI 2	0.223	0.376	0.475	0.216	0.227	0.809	0.397
BI 3	0.403	0.201	0.328	0.536	0.223	0.631	0.387
BI 4	0.369	0.198	0.368	0.174	0.430	0.843	0.148
BI 5	0.547	0.406	0.499	0.144	0.168	0.705	0.362
BI 6	0.164	0.306	0.499	0.167	0.298	0.743	0.156
PD 1	0.326	0.477	0.357	0.397	0.349	0.267	0.802
PD 2	0.309	0.461	0.357	0.184	0.474	0.179	0.862
PD 3	0.477	0.442	0.343	0.216	0.359	0.182	0.774
PD 4	0.239	0.461	0.520	0.336	0.129	0.240	0.867

4.3 Hypothesis testing

In this paper, the research hypotheses were analyzed by hierarchical regression method. According to the steps of "direct effect-mediating effect-moderating effect", the model was stratified and tested, and the results were shown in table 6. First, the influence of four control variables (i.e. project duration, project investment, project type and project location) on BI was investigated (model 1). Subsequently, independent variables (paternalistic and transactional leadership), mediating variable (trust in leader) and moderating variable (power distance) were

gradually added into the regression model, namely model 2, 3 4. In order to better examine the moderating role of cultural contextual element, we performed a regression analysis on the product terms of independent and moderating variable, namely model 5. Hierarchical regression results showed that with the continuous addition of variables, the R^2 of the model increased gradually (from 0.03 to 0.67). This showed that the level of interpretation of the model was constantly improved.

When other variables were not considered (model 1), the influence of control variables on BI was not significant. When independent variables were added to the regression model (model 2), it was found that authoritarian leadership ($\beta = -0.33$, $p < 0.001$) had a significantly negative impact on BI. Moral leadership ($\beta = 0.44$, $p < 0.001$) and transactional leadership ($\beta = 0.26$, $p < 0.01$) had significant positive effects on BI. The effect of benevolent leadership on BI was not significant ($\beta = 0.08$). Hypotheses H_{1a} , H_{1c} , and H_2 were supported.

Table 6. Leadership styles, trust in leader and power distance on BI

	BI				
	Model 1	Model 2	Model 3	Model 4	Model 5
Control variables					
Project duration	0.11	0.05	0.10	0.09	0.07
Project investment	0.03	-0.08	0.05	0.03	0.02
Project type	0.07	0.03	0.02	0.06	0.04
Project location	-0.01	-0.02	-0.05	-0.01	-0.04
Independent variables					
Authoritarian leadership		-0.33***	-0.24***	-0.22**	-0.22**
Benevolent leadership		0.08	0.07	0.07	0.04
Moral leadership		0.44***	0.36***	0.36***	0.34***
Transactional leadership		0.26**	0.19**	0.18*	0.17*
Mediating variable					
Trust in leader			0.38***	0.35***	0.34***
Moderating variable					
Power distance				0.27**	0.27**
Product terms					
Authoritarian leadership * Power distance					0.32**
Benevolent leadership * Power distance					-0.03
Moral leadership * Power distance					0.13*
Transactional leadership * Power distance					-0.18*
R^2	0.03	0.34	0.46	0.59	0.67
ΔR^2	0.03	0.31	0.12	0.13	0.08

Mediation analysis

As for the analysis of the mediating role (trust in leader), according to Baron and Kenny's (1986) suggestion, it is divided into four steps. First, examining the correlation between independent and mediating variable. Second, examining the correlation between independent and dependent variable. Third, testing the correlation between mediating and dependent variable. Last, controlling the influence of mediating variable on dependent variable, and checking whether the initial effect of independent variables on dependent variable weakens or disappears, so as to determine whether the mediating effect is complete or partial. As shown in model 7 in table 8, authoritarian leadership ($\beta = -0.17, p < 0.05$), moral leadership ($\beta = 0.34, p < 0.01$) and transactional leadership ($\beta = 0.21, p < 0.05$) had significant effects on trust in leader. Model 2 showed that authoritarian leadership ($\beta = -0.33, p < 0.001$), moral leadership ($\beta = 0.44, p < 0.001$) and transactional leadership ($\beta = 0.26, p < 0.01$) had significant effects on BI. Model 3 showed trust in leader ($\beta = 0.38, p < 0.001$) had a significant impact on BI. In addition, according to model 2 and 3, when trust in leader entered the regression equation, the path coefficient of authoritarian leadership ($\beta = -0.33 \rightarrow -0.24$), moral leadership ($\beta = 0.44 \rightarrow 0.36$) and transactional leadership ($\beta = 0.26 \rightarrow 0.19$) on BI significantly decreased. This showed that trust in leader played a partial mediating role between leadership styles and TMT BI. Hypothesis H₅ was partially supported.

Moderation analysis

The moderating effect of the power distance in TMT was tested in three steps. Firstly, examining the correlation between control and dependent variables. Secondly, examining the correlation between independent and dependent variable. Last, checking the correlation between product terms between independent and control variables and dependent variable. According to model 5, the interaction term of authoritarian leadership and power distance ($\beta = 0.32, p < 0.01$) had a positive moderating effect on BI. H_{6a} was supported. The interaction term of moral leadership and power distance ($\beta = 0.13, p < 0.05$) had a positive moderating effect on BI. H_{6c} was supported. The interaction term of transactional leadership and power distance ($\beta = -0.18, p < 0.05$) had a negative moderating effect on BI. H_{6d} was supported. The influence patterns of the above interactions were shown in figure 2-4.

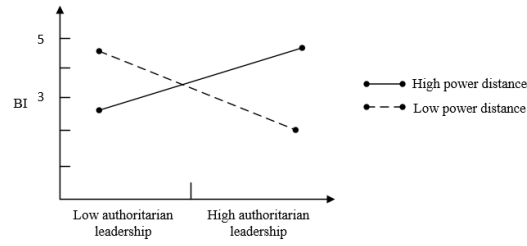


Fig 2. The moderating role of power distance between authoritarian leadership and BI

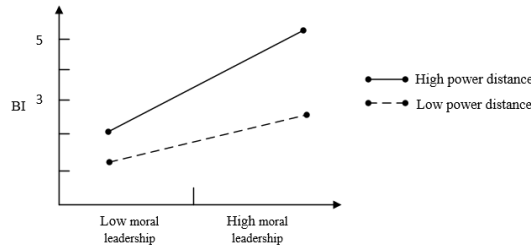


Fig 3. The moderating role of power distance between moral leadership and BI

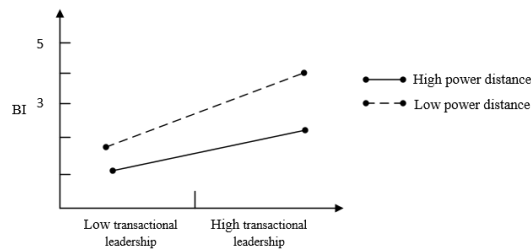


Fig 4. The moderating role of power distance between transactional leadership and BI

5 Discussion

Moral leadership can significantly stimulate the BI of TMT. This result is consistent with the conclusion that moral leadership is the core aspect of paternalistic leadership. The ethics of trustworthy and “leading by example” are the characteristics that leaders need to have in complex situations. Compared with general projects, the particularity of megaprojects makes it difficult to find two megaprojects with high similarity. Every TMT needs to design its own pattern to meet the specific construction requirements. However, new pattern inevitably have flaws. Therefore, the high degree of moral self-discipline of top leader is an effective supplement to the formal rules (Cheng and Wang, 2015). Top leader with high moral effectively avoids power rent-seeking behavior based on personal interests, which can be recognized and imitated by other TMT members. As a result, TMT members are more likely to trust their top leader and contribute more

to the TMT by sharing knowledge and information.

Authoritarian leadership negatively influences the BI of TMT. Authoritarian leaders emphasize absolute power and no doubt decision-making. Under the tide of industrialization, the traditional authoritarian leadership suffered a great impact. Limited by knowledge and ability, no leader can control megaprojects alone. It makes sense to address the complexity of megaprojects through the power of TMT. The centralized power fundamentally restrains the participation of TMT members. The decision-making requires the collective wisdom of the TMT, rather than the individual ability of a leader. Moreover, TMT has the nature of temporary. TMT personnel composition will be constantly adjusted and replaced due to different tasks. TMT members further neglect interpersonal relationships and downplay the relationship between superiors and subordinates, which objectively weakened the top leader authoritarian foundation.

Benevolent leadership does not have a significant impact on BI. *This is different from the expected result.* Some scholars have ever questioned the true intention of benevolent leadership. They believed that the purpose of benevolence is to bring pressure on TMT members to repay or control them (Mustafa and Lines, 2012). The fundamental driving force is malicious (Vandevier, 2014). Different from the individualized care of transformational leadership, benevolent leadership is usually applied in authoritarian situations. Behaviors such as "treating subordinates equally and being willing to accept suggestions from subordinates" do not belong to the scope of benevolent leadership. Therefore, benevolent leadership has no significant effect on information sharing within the TMT.

Transactional leadership can also promote TMT BI in megaprojects. Compared with the paternalistic leadership, transactional leadership does not emphasize the behavior of the leader, but in an equal atmosphere of cooperation. TMT members make efforts to achieve goals and get corresponding returns. In megaprojects, top leader will set clear task objectives for TMT, lead and motivate TMT to complete team tasks. At the same time, the TMT members' sense of responsibility will be strengthened to the greatest extent by satisfying their material, spiritual and political needs. They can take part more actively in the megaproject decision-making process, maintain close contact with others, and carry out various types of teamwork. It is worth noting that transactional leadership has less influence on BI than paternalistic leadership. The likely reason is that incentive means in megaprojects are inadequate. Huang (2010) pointed out that the imperfect

reward and punishment mechanism are the main reasons that hinder the members to exert their work enthusiasm. Therefore, the lack of incentive measures and unclear incentive rules weaken the influence of transactional leadership on BI in megaproject TMT.

The mediating role of trust in leader has been demonstrated. This finding provides a strong support for the generation of BI. The intrinsic motivation created by trust in leader helps TMT members better integrate into the team and generate cooperative ideas, which plays a bridge role between extrinsic motivation factors such as leadership behavior and BI. In addition, this result also supports the conclusion of incentive research from another aspect. Compared with ordinary team members, senior managers pay more attention to emotional needs. In megaprojects, the TMT can maximize concentrate power to complete the project construction. But at the same time, it has to face problems such as lacking of trust among TMT members, especially for top leader. From the research results, we know that even transactional leadership that emphasizes an open and cooperative atmosphere, also relies on trust in leader. Thus, the top leader should spare no effort to gain the trust of TMT members.

The moderating effect of power distance was proved. The results show that TMT BI changes with the change of personal values under the same leadership style. Under high power distance, authoritarian leadership positively affects BI. This shows that in megaproject organizations, members' perception of power is the basis for the effectiveness of authoritarian leadership. This also justifies why authoritarian leadership is still prevalent in some countries. In the process of megaproject construction, complex tasks bring great pressure to TMT, and there are not enough mature experiences for members to learn from. At this time, a dominating leader can often bring courage and determination for TMT. If TMT members accept this power distance, then what authoritarian leadership brings is not the fading of cooperative enthusiasm in TMT, but the unprecedented cohesion. Therefore, it is reasonable to believe that when high power distance prevails in an organization, authoritarian leadership can also promote TMT BI in the face of complex tasks and huge performance pressure.

6 Implications

This study has some implications to the management of megaproject TMT. 1) Both moral leadership and transactional leadership are beneficial to TMT BI. On the one hand, the top leader

should earnestly practice what he/her advocates and play an exemplary role, which can increase the cohesiveness of TMT and the willingness to work together. On the other hand, top leader should perfect the incentive and punishment rules, clarify the ways to get rewards, and give spiritual, material and political rewards to the TMT members who perform well. 2) A high degree of trust in leader is an important prerequisite for leadership. Leadership style is more of an external management means, and whether it can be applied to TMT members needs also consider their psychological states. Therefore, the top leader should take various humanized measures such as strengthening interpersonal interaction, encouraging and affirming the work performance of the TMT members. 3) Leadership styles play different roles in different environments. It is crucial to identify the right leadership style for particular contexts (e.g. megaproject). In an environment with high power distance, the top leader can properly show authority to improve decision-making efficiency and promote team cohesion. In the low power distance environment, the top leader should give priority to virtue and motivation, and avoid arbitrary power. Therefore, understanding the value preferences of TMT members is the first step to choose suitable leadership styles.

7 Conclusions

Through the above studies, we draw the following conclusions: 1) Moral and transactional leadership have significant positive influence on TMT BI. Authoritarian leadership has negative influence on TMT BI. Benevolent leadership has no effect on BI. 2) Trust in leader plays a partial mediating role between leadership style and BI. 3) Power distance has a significant moderating effect on leadership styles and BI. Under the condition of high power distance, authoritarian leadership positively influences BI. Moral leadership has a more positive effect on BI, while the positive effect of transactional leadership on BI is inhibited.

The research contributions of this paper are reflected in the following aspects: 1) There are constant calls for leadership to be studied in specific situations (Avolio et al., 2009; Dinh et al., 2014). We respond to this call and extend the research on transactional and paternalistic leadership to the previously under-studied temporary organizational situation. It is the first time to verify the influence of paternalistic and transactional leadership on TMT BI under the background of megaprojects, which enriches the leadership theory and the upper echelons theory. 2) We examine the mediating role of trust in leader, analyze the ways in which leadership functions from the

perspective of internal psychological mechanism, and uncover the "black box" between external motivation such as leadership and BI. 3) Combined with the path-goal theory of leadership behavior, we further systematically analyze the contingency influence of power distance on leadership and BI, and further deepen and expand the situational study of leadership from the perspective of cultural characteristics.

Of course, this paper also has three limitations. Firstly, the research data is a cross-sectional study, and it is necessary to carry out longitudinal design in future research. Secondly, most of cases come from China. The sampling approach might affect the generalizability of the findings. Future research can compare the impact of leadership among different countries. Thirdly, the complementary effects of paternalistic and transactional leadership only remain in the stage of theoretical analysis. In the future, the dual effects of leadership will be further studied to test the interactive effects of the two kinds of leadership.

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