

# Leader's Information Processing Preferences and Leadership Effectiveness: The Moderating Effect of Environmental Uncertainty

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**Abstract.** Drawing on trait activation theory, the present study empirically examines the moderating role of environmental uncertainty plays in linking leader's information processing preferences (thinking-feeling, TF) with different aspects of leadership effectiveness (task performance and contextual performance). Using a sample of 236 leaders in China, we found that (1) leader's information processing preferences (TF) was positively related to both leader's task performance and contextual performance, that is, F leaders have higher task performance as well as contextual performance than T leaders; (2) environmental uncertainty moderated the relation between TF preference and task performance, that is, above relation was positive and stronger when environmental uncertainty was low rather than high; (3) environmental uncertainty moderated the relation between TF preference and contextual performance, that is, above relation was positive and stronger when environmental uncertainty was high rather than low. Theoretical contributions, practical implications and future directions were discussed.

**Keywords:** Leader, Information Processing Preferences, Leadership Effectiveness, Environmental Uncertainty, Moderation.

## 1 Introduction

In the present study, we extend the trait activation mechanism of leader's information processing preferences (thinking-feeling, TF) on leadership effectiveness with the proposition that environmental uncertainty moderates the relationship between leader's information processing preferences and leadership effectiveness. Information processing preferences are very important to leader's making decision and then to leadership effectiveness [1]. Previous research had identified leader's information processing preferences- Thinking (T) preferring to make decisions base on objective logic and Feeling (F) preferring to make decisions base on others' or group values - as an important factor underlying leadership behaviour [17], team performance [20], consciousness development [37], self-other agreement of leadership effectiveness [3, 31].

Despite these findings, our knowledge of how leader's information processing preferences relates to leadership effectiveness, especially under uncertain environmental conditions, is still limited. Today's organizations are facing dramatically increasing environmental uncertainty. Whether leader could improve effectiveness under uncertain environmental conditions has become a prominent factor that helps organizations attain their competitive advantages [39]. Built on trait activation theory which asserts certain situations are trait-relevant and can increase the likelihood a trait is manifested in behaviour [32, 33], we empirically examine the moderating effect of environmental uncertainty on the relationship between leader's information processing preferences and leadership effectiveness, to address above gap.

## **2 Literature Overview and Hypotheses**

### **2.1 Leader's TF Preference and Leadership Effectiveness**

Although scholars vary in their definition of leadership effectiveness, leadership effectiveness has always been characterized as how well leader capacities and how well leaders function [8, 27]. We view leadership effectiveness as leader performance, conceivably through the component of individual work performance. A wealth of evidence exists to support the multidimensional nature of individual work performance [7, 6]. Scholars differentiate work performance into task performance and contextual performance on the basis of job roles [4, 3]. Further, the research extended to the study of management positions and divided the manager's performance into two parts: task performance and contextual performance [19]. Although there is a significant distinction between leaders and managers [22, 40], we still assumed that participants occupied formal management positions are leaders as management and leadership roles overlap [19]. Thus the current study seeks to operationalize leadership effectiveness in terms of both task performance and contextual performance.

According to the study [24], task performance of the leader means that the leader's behaviour is guided by completing the work, effectively selecting and using the resources, and maintaining orderly and credible management. Contextual performance refers to the leader's behaviour to establish relationships, help others, enhance cooperation and teamwork, as well as increase employee satisfaction and job-oriented.

TF, which pertains to information processing preferences. Leaders with a preference for thinking (T leaders) prefer to make decisions by objective logic; whereas leaders with a preference for feeling (F leaders) prefer make decisions on the basis of others' or group values [25]. F leaders are more subjective than T leaders because they are based on personal or community values [26]. According to information processing perspective, by obeying the objective truth and the principle of fairness, T leaders maybe make more rational decision, and achieve higher task performance than the more subjective, F leaders who rely on individual and group values. The study found that preference for thinking positively correlated to

"experienced" and "reliable" indicators in leadership performance, while preference for feeling are negatively related [10]. They explained that T leaders pay more attention to 'right' than 'liking'. And the authors studied the relationship between TF dimensions and leadership performance, and found that as much as 79% of high-performance leaders are T leaders [11]. Accordingly, we propose that T leaders have higher task performance than F leaders from the functionalist perspective. As a high TF score indicates a preference for feeling whereas a low score indicates a preference for thinking when processing information. TF Preference was negatively related to task performance as following hypothesis.

Hypothesis1. TF preference is negatively related to leader's task performance. That is, T leaders have higher task performance than F leaders.

Contextual performance can be defined as behaviours that influence social, organizational and motivational climate in which the work is performed [4, 5]. Contextual performance is extra-role performance which can be distinguished from task performance. Contextual performance related activities include cooperating, helping peer and facilitating team performance which are the voluntary and loyal behaviors [16]. Leaders are expected to perform above contextual behaviours that may not only be directly related to leadership functions but also are more crucial for team and organization performance. F leaders always make decisions subjectively based on values and feeling processes [3], who would be have high social sensitivity and other-orientation [36, 21]. Some studies have found that the T leaders often have more arbitrary and less cooperative behaviours in their relationship with subordinates [26]. Accordingly, we propose that F leaders would have more helping and cooperating behaviours which facilitating contextual performance than F leaders from the social constructivist perspective. We put forth the following hypothesis:

Hypothesis2. TF preference is positively related to leader's contextual performance. That is, F leaders have higher contextual performance than T leaders.

## **2.2 The Moderating Effect of Environmental Uncertainty**

Previous research and review suggest that leader's individual differences relate to leadership effectiveness [23]. However, the correlation is often small [2]. The identification of moderators could increase the relation of individual differences–leadership effectiveness relation [29]. We extend previous studies by examining environmental uncertainty moderates the relation between leader's information processing preferences (TF) and leadership effectiveness.

Environmental uncertainty refers to the degree to which an absence of patterns, unpredictability, and unexpected change characterize a firm's context [12]. According to trait activation theory, individual traits are viewed as latent potential residing in a person that can be triggered into actions by trait-specific situational cues or "weak" situation [32]. Uncertain environment is a "weak" situation because it couldn't provide

clear cues about desired behaviour [2]. It provides a “weak” situation that would be favourable for TF Preference to be expressed into the corresponding behaviours.

T leaders prefer to make decisions based on rational thought; whereas F leaders prefer to make decisions based on personal or group values [25, 3]. On the one hand, uncertain environment requires leaders have a higher ability to precisely and reasonably judge information and analyze information so as to improve task performance [1]. Environmental uncertainty provides situational cues for T leaders' trait-relevant expression. Accordingly, we propose that as environmental uncertainty increases, T leaders would have higher task performance. On the other hand, according to uncertainty–identity theory [18], F leaders would reduce members' self-uncertainty by providing members a sense of identification and belonging because they pay attention to personal or group values and feelings, which would be helpful to improve contextual performance. We propose that as environmental uncertainty increases, F leaders would have higher contextual performance. Overall, Environmental uncertainty will moderate the relationship between TF and task performance/contextual performance. We put forth the following hypothesis:

H3: Environmental uncertainty will moderate the relationship between TF preference and leader's task performance, such that the relationship will be stronger under low environmental uncertainty than under high environmental uncertainty.

H4: Environmental uncertainty will moderate the relationship between TF preference and leader's contextual performance, such that the relationship will be stronger under high environmental uncertainty than under low environmental uncertainty.

### **3 Methods**

#### **3.1 Sample and Data Collection**

We collected data from different sources (i.e., focal manager, and superiors) at different time points from 58 Chinese companies. Leader's information processing preferences (TF) and environmental uncertainty was self-rated by 290 focal leaders. Leadership effectiveness was assessed by 58 supervisors. Participants were assured their survey results would stay confidential and anonymous and be used for the purpose of scientific research only. The number of valid responses we received from leaders and supervisors were 236 and 45 respectively, yielding a response rate of 81.38% and 77.59% respectively. The average age of the participants was 38, and average tenure in the company was 9.5 years. 57.63% of the participants were male, and 80% had a college or higher degree. Age, education level and tenure were normally distributed.

#### **3.2 Measures and Analysis**

We used existing scales to measure all variables. Leader's information processing preferences (TF) was measured with 23 items from MBTI-F version. We adopted a

continuous scoring method as recommended by recent studies [14, 15]. A low TF score indicates the leader prefers to rely on objective logic (T) when processing information, whereas a high TF score indicates the leader tends to process information based on values or feelings (F). The Cronbach  $\alpha$  of TF scale was .72 and the split-half reliability was .74, both exceeding .70. Task performance (TP) was measured with 7 items from existing scale [1]. The Cronbach  $\alpha$  for this scale was .946. Contextual performance (CP) was measured with the 7-item scale [38]. The Cronbach  $\alpha$  for this scale was .946. Environmental uncertainty (EU) was measured with the 7-item scale [13]. The Cronbach  $\alpha$  for this scale was .949. We controlled other three dimensions of MBTI, Extravert–Introvert (EI), Sensing–Intuition (SN) and Judging–Perceiving (JP). We employed path analysis and structural equation modelling (SEM) to analyze the proposed model using SPSS13.0 and LISREL8.80.

## 4 Results

### 4.1 Descriptive Statistics Results

We firstly conducted descriptive statistics and correlation analysis. The results were summarized in Table 1. Regarding correlations, the results showed that Leader’s information processing preference (TF) was positively correlated with contextual performance ( .169,  $p < .01$ ), but not with task performance ( .058,  $p > .05$ ).

**Table 1.** Descriptive Statistics and Correlations among variables

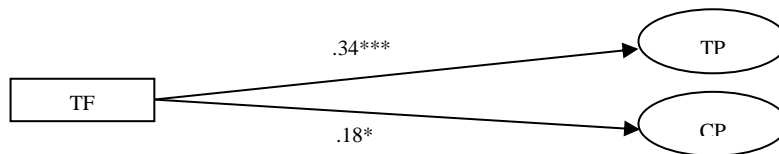
	Mean	s.d.	EI	SN	TF	JP	EU	TP	CP
EI	92.82	22.92	1.000	-.244(**)	-.295(**)	-.090	.182(**)	.063	.015
SN	87.92	20.87		1.000	.414(**)	.557(**)	.332(**)	-.071	.171(**)
TF	89.14	22.64			1.000	.513(**)	.149(*)	.058	.169(**)
JP	83.75	23.14				1.000	.390(**)	-.247(**)	.046
EU	3.21	.62					1.000	-.050	-.092
TP	3.72	.77						1.000	.129(*)
CP	3.65	.72							1.000

**Note:** Two-tailed test; EI: Extraversion–Introversion; SN: Sensing–Intuition; TF: Thinking–Feeling; JP: Judging–Perceiving; EU: Environmental uncertainty; TP: task performance; CP: Contextual performance \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ ;  $n = 236$

### 4.2 Hypotheses Testing Results

To test direct effects of TF on task performance and contextual performance for H1 and H2, we then conducted a mixed-model path analysis. The model fit indices indicated a good fit ( $\chi^2/df = 1.55$ , below 2.00; RMSEA = .049, below .08; GFI = .92, AGFI = .90, both above the acceptable level of .90; NFI, NNFI, IFI and CFI, all above .95). The results were shown in Figure 1. The result confirmed the

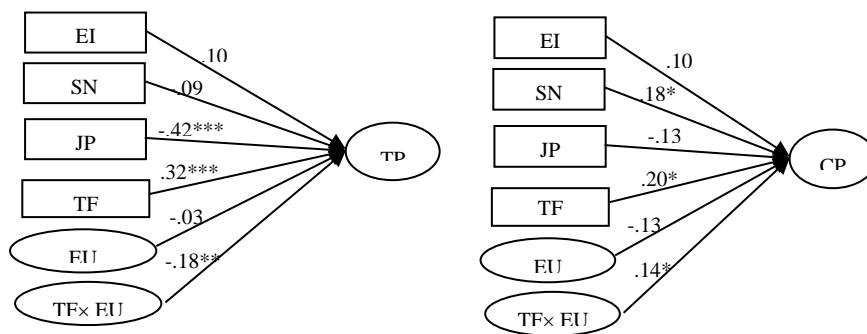
hypothesized relationship between TF preference and contextual performance ( $\beta = .18, p < .05$ ) after controlling for EI ( $\beta = .03, p > .05$ ), SN ( $\beta = .13, p < .05$ ), JP ( $\beta = -.10, p > .05$ ), supporting H2. However, although the result found that TF preference was positively correlated with task performance ( $\beta = .34, p < .001$ ), but not supporting H1 because we supposed that TF preference is negatively related to leader's task performance. That is, both the task performance and contextual performance of F leaders was higher than T leaders.



**Note:** TF: Thinking–Feeling; TP: task performance; CP: Contextual performance  
 \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ ;  $n = 236$

**Fig. 1.** Direct effect of TF on task performance and contextual performance

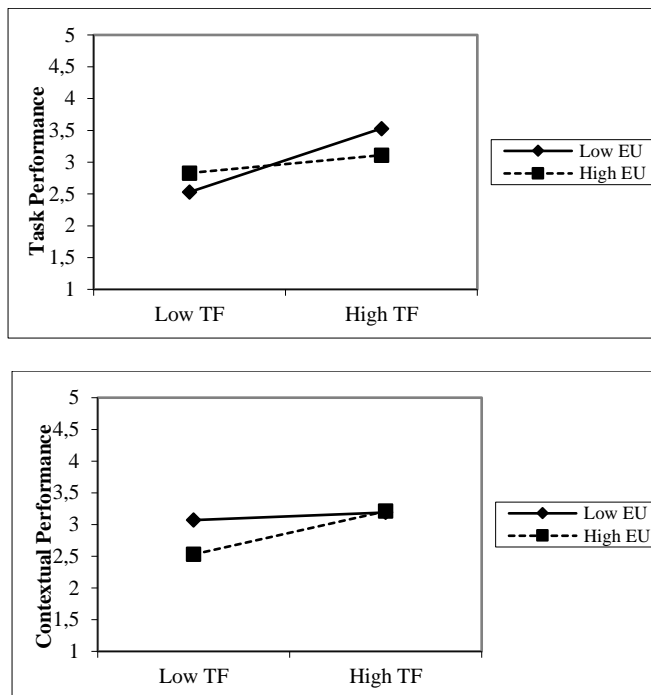
We finally test moderated hypothesis for H3 and H4, using a mixed-model path analysis. The results were shown in Figure 2. For H3 (Figure 2, left), the model fit indices indicated a good fit of the proposed model ( $\chi^2/df = 1.89$ , below 2.00; RMSEA = .062, below .08; GFI = .92; AGFI = .88; NFI, NNFI, IFI and CFI all above .95). Our results showed that the interaction term between TF preference and environmental uncertainty was negatively but significantly related to task performance ( $\beta = -.18, p < .01$ ), supporting H3. For H4, the results were shown in Figure 3. For H4 (Figure 2, right), the model fit indices indicated a good fit of the proposed model ( $\chi^2/df = 1.98$ , below 2.00; RMSEA = .065, below .08; GFI = .93; AGFI = .88; NFI, NNFI, IFI and CFI all above .95). Our results showed that the interaction term between TF preference and environmental uncertainty was positively but significantly related to contextual performance ( $\beta = .14, p < .05$ ), supporting H4.



**Fig. 2.** Moderated effects of environmental uncertainty

**Note :** EI: Extraversion–Introversion; SN: Sensing-Intuition; TF: Thinking–Feeling; JP: Judging–Perceiving; EU: Environmental uncertainty; TP: task performance; CP: Contextual performance \*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ ;  $n = 236$

Figure 3 further graphically illustrate above interaction effects. Figure 3 shows that the relation between TF preference and task performance was positive and stronger when environmental uncertainty was low rather than high. However, the relation between TF preference and contextual performance was positive and stronger when environmental uncertainty was high rather than low.



**Note:** TF: Thinking–Feeling; EU: Environmental uncertainty

**Fig. 3.** Moderated effects of environmental uncertainty

## 5 Discussion and Conclusion

### 5.1 Discussion

This paper set out to examine the moderating effect of environmental uncertainty on the relationship between leader's information processing preferences (TF) and leadership effectiveness. Drawing on trait activation theory, the present study empirically examined and revealed three interesting findings: (1) TF preference was positively related to both leader's task performance and contextual performance, that is, F leaders have higher task performance as well as contextual performance than T

leaders; (2) environmental uncertainty moderated the relation between TF preference and task performance, that is, above relation was positive and stronger when environmental uncertainty was low rather than high; (3) environmental uncertainty moderated the relation between TF preference and contextual performance, that is, above relation was positive and stronger when environmental uncertainty was high rather than low.

The present study provides three distinct contributions to the extant literature. Firstly, our results are most favorable towards the importance of leader's information processing preferences, one of individual differences, in improving leadership effectiveness under uncertainty. Our results suggested high environmental uncertainty weakened the relationship between TF preference and task performance whereas strengthened the relationship between TF preference and contextual performance. Under high uncertainty, F leaders showed more high contextual performance. Subordinates need more guidance under high environmental uncertainty, F leaders would give them more confidence and help them to improve performance [30] (Shamir & Howell, 1999). Secondly, our results also contributed to trait activation theory by demonstrating the activating role of a contextual factor-- environmental uncertainty-- on TF preference. Thirdly, our contribution relates to the MBTI literature and, more specifically, to extension of Jung's psychological type theory in Chinese leadership domain. Our results highlighted the association between leader's TF Preference and leadership effectiveness and demonstrated that F leaders had higher task and contextual performance than T leaders. However, H1 was not supported by the results. We supposed that TF preference is negatively related to leader's task performance. That is, T leaders have higher task performance than F leaders. Conversely, F leaders have higher task performance than T leaders. We try to explain from context perspective. Maybe there are conditions under which T leaders are more likely to have higher task performance (e.g. task characteristics). Future studies should consider the other context factors even examine more complex mechanisms by multiple moderating effects, moderated mediation or mediated moderation.

These findings also had important practical implications. Managers often use the MBTI instrument to assist coaching, team building, and management development, decision making and managerial effectiveness [3]. The current findings are useful for HR managers and business leaders. The most important practical contribution of this study is that our results provided guidance for organizational personnel selection and training in an uncertain environment. In uncertain environments, using feeling preference would be helpful to cope with uncertainty by providing members a sense of identification and belonging. As such, it is better to select F leaders or provide related training to improve leadership effectiveness. This idea is consistent with the emotional intelligence literature [34] (van der Linden, Pekaar, Bakker, et al., 2017).

## **5.2 Limitations and Future Research**

Several limitations of the present study provide possible opportunities for further research. First and foremost, the current research, like all cross-sectional studies, does



not allow for conclusions about causality. Future research may want to use longitudinal data or experimental design to examine the causal relationships. Secondly, it incorporates Chinese-specific sample. Future research may examine the relationships using samples from other parts of the world and further do some comparing. Thirdly, our study did not examine the question of how leader's TF preference affects outcomes. Future research may examine more complex mechanisms by multiple moderating effects, moderated mediation or mediated moderation.

### 5.3 Conclusion

In sum, the present study extends the trait activation mechanism of leader's information processing preferences (TF) on leadership effectiveness by examining the moderated effect of environmental uncertainty on above relationship. Future research need to further explore how leader's information processing preferences (TF) affect leadership effectiveness under contextual variables by examining moderated mediation or mediated moderation effect.

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