

Exploring the relationships between perceived transformational leadership and transactional leadership and teachers' intellectual style

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Abstract

The purpose of this study was to understand the relationship between perceived transformational leadership and transactional leadership style and teachers' intellectual style. Based on 967 middle school teachers' survey answers, this study identified that there are positive relationships between perceived transformational leadership and Type I intellectual style, as well as a positive relationship between perceived instructional leadership and Type II intellectual style. This study paves the way for a theoretical understanding of the relationship between leadership style and teachers' intellectual style and provides practical suggestions for education practitioners.

Keywords: *Intellectual style, Transformational leadership, Transactional leadership*

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The relationships between transformational leadership and transactional leadership and teachers' intellectual style

Introduction

Aligned with international trends, Chinese education reform has focused on the roles of teachers in the change process at different levels. For instance, teachers in China need to actively participate in education reform. In addition, they are also required to take more active responsibilities in their own classrooms and have a clear understanding of the direction of school management. Effective educational change requires not only individual thinking but also systems thinking (Hopkins et al., 2014). Therefore, teachers are required to go beyond their comfort zone using appropriate intellectual style, which means a leadership style that helps teachers think outside of the box is crucial. Except for Leithwood's four paths research that has focused on teachers' motivation (Leithwood & Sun, 2012; Thien & Adams, 2019), there has been a lack of sufficient research on how to help teachers to use an appropriate intellectual style to move to a higher level.

Intellectual style can be regarded as *cognitive style* (Zhang & Sternberg, 2005). Teacher cognition is helpful for building classroom management skills, which may shape attitudes towards organizing the class (Kubanyiiova, 2015). Teacher cognition may impact decision making in the classroom (Kahai et al., 2013). Studies have confirmed that different types of leadership may have various influences on teacher cognition. For instance, while transformational leadership may foster teacher cognition, transactional leadership may decrease teacher cognition (Kahai et al., 2013). However, there is a lack of sufficient research on the relationship between leadership style and teachers' intellectual style. Therefore, this study is aimed to fill up this gap.

Literature Review

This section provides information about intellectual styles, main leadership styles and the relationship between leadership styles and intellectual styles for creating a conceptual framework in this study.

Intellectual Styles

The term "intellectual style" is not a label for any specific phenomenon or issue, but rather is a collective term that includes all the commonly accepted concepts of style, such as *cognitive style*, *decision-making and problem-solving styles*, *learning style*, and *thinking style*, to name but a few (Zhang & Sternberg, 2005). It has been a subject for investigation since as early as ancient Greece, and therefore has generated a rich body of literature throughout history (Zhang & Sternberg, 2005). In a comprehensive literature review on style theories, Nielsen (2012) counted 78 different theories on styles in nearly five hundred articles. Similarly, Evans and Waring (2012) identified 84 varying style frameworks whilst reviewing applications of styles in educational contexts. Research on styles reached its "golden age" between the late 1950s and 1970s when a "diverse and even massive collection" of theories and frameworks on style history were posited. This collection later evolved into two major types of work: *conceptual integration* of previous

ideas and empirical investigations into the relationships between different style constructs (Zhang & Sternberg, 2005).

Navigating through multiple major style theories such as Curry’s (1983) famous “onion model”, Miller’s (1987) model of cognitive processes and styles, Riding and Cheema’s (1991) integrated model of cognitive styles, and so forth, as illustrated in Table 1, Zhang and Sternberg (2005) proposed a “threefold model” that classifies intellectual styles into three general categories, i.e. Types I, II, and III.

Table 1

Intellectual Styles

The three style types			
Degree of structuring (structure – free of structure)	Low	High	varied ^c
Degree of cognitive complexity (simple – complex)	High	Low	varied ^c
Degree of conformity (nonconform – conform)	Low	High	varied ^c
Degree of management/control (autonomy – authority)	Low	High	Varied ^c
Style construct ^b	Type I styles	Type II styles	Type III styles
a. Learning approach	Deep	Surface	Achieving
b. Career-personality type	Artistic	Conventional	Realistic, Investigative, Social, Enterprising
c. Mode of thinking	Holistic	Analytic	Integrative
d. Personality type	Intuitive, Perceiving	Sensing, Judging	Thinking, Feeling, Introversion, Extraversion
e. Mind style	Concrete random	Concrete sequential	Abstract random, Abstract sequential
f. Decision-making style	Innovation	Adaptation	
g. Conceptual tempo	Reflectivity	Impulsivity	
h. Structure of intellect	Divergent thinking	Convergent thinking	
i. Perceptual style	Field-independence	Field-dependence	
j. Thinking style	Legislative, Judicial, Hierarchic, Global	Executive, Monarchic, Local, Conservative	Oligarchic, Anarchic, Democratic, Internal, external

Note. From Zhang, 2005, cited in “Intellectual style theories: Different types of categorizations and their relevance for practitioners,” by T. Nielsen, 2014, *SpringerPlus*, 3(1), 737 (<https://doi.org/10.1186/2193-1801-3-737>).

According to Zhang and Sternberg (2005), Type I is considered to be the creative styles, characterized by a preference for autonomy and higher levels of cognitive complexity; Type II includes the analytical styles with a norm-favoring tendency, and denotes lower levels of cognitive complexity; Type III styles may manifest the features of either I or II depending upon the stylistic demands of the specific task being dealt with, and they are referred to as *the performance and socially-oriented styles* (Nielsen, 2014, p. 7; Zhang & Sternberg, 2005).

Leadership

As one of the most-examined phenomena in social science (Day & Antonakis, 2012), the concept of leadership has received a great deal of attention in both practitioner and academic literature. As with many common concepts, there have been countless efforts to give it an accurate definition. For instance, by the end of the 20th century, there had been no less than 650 definitions of leadership, yet there has been no consensus on a widely, not to mention universally, accepted definition (Silva, 2016). However, it is generally agreed upon that leadership is a social influence process where the leader motivates individuals to follow him/her and to co-operate with one another in order to achieve organizational goals (Nanjundeswaraswamy & Swamy, 2014; Vroom & Jago, 2007). In an article reviewing leadership theory and research, Yukl (1989) further specified that such influence can be over “task objectives and strategies, commitment and compliance in the behavior to achieve these objectives, group maintenance and identification, and the culture of an organization” (p. 253).

Leadership Styles

Characterized by different leadership activities and behaviors, leadership can manifest as different styles. For example, in as early as 1939, Lewin et al. (1939) proposed a framework encompassing three leadership styles: *authoritarian (or autocratic) leadership*, *participative (or democratic) leadership*, and *laissez-faire (or delegative) leadership* (Cherry, 2019a). Overlapping with such a pioneering model, leading leadership scholars Bass and Avolio (1994) proposed another influential framework—the Full Range of Leadership model—that includes a spectrum of three general types of leadership styles, namely *laissez-faire leadership*, *transactional leadership*, and *transformational leadership*.

Laissez-Faire Leadership. Laissez-faire is a French expression meaning “let it be” or “leave someone or something alone.” As a philosophical thought, it implies that each individual is entitled to a basic right to freedom (Gaspard, 2003). In that sense, laissez-faire leadership is considered a delegative approach, meaning the leaders move out of the way and let the followers fulfill their responsibilities in the manner they deem fit without too much control or too many restrictions (STU Online, 2014).

Although much research has shown that laissez-faire leadership is closely associated with low productivity, there are leadership scholars who believe that such a leadership style can prove to be effective especially when the subordinates are highly skilled and motivated (Carli & Eagly, 2011; Nawaz & Khan, 2016). Typical industries where such a leadership approach can work include advertising, product design, startup social media companies, R&D, high-end architectural and specialized engineering firms, etc., largely for the reason that this leadership style encourages faster decision-making and innovation and allows room for personal growth (Cherry, 2020b).

However, the application of laissez-faire leadership also takes place in the education sector. For example, Astuti et al. (2019) examined the headmaster’s leadership style in a kindergarten in Indonesia and found that laissez-faire leadership made up 33.7% of the leadership styles exhibited by the headmaster of the institution, with the rest being democratic leadership (39.8%), and autocratic leadership (26.5%).

Transactional Leadership. Before the introduction of transformational leadership in the leadership literature, transactional leadership and contingent reinforcement had been considered to be central to effective leadership (Bass et al., 2003). Under such a leadership relationship, followers comply with the leader in order to obtain contingent rewards and/or recognition and to avoid punishments when failing to do so (Bass, 1990; Bass et al., 2003).

Besides *contingent rewards*, another characterizing element of transactional leadership is *management by exception*, which, as illustrated in Table 3, can manifest in an active or a passive way. According to Bass et al. (2003), the active version of management by exception appears to be more corrective, where the leaders clarify the expectations of the organization on performance, closely monitor the subordinates, and intervene when exceptional situations occur, whilst under the passive version, leaders may passively wait for problems to come up before taking any action, if at all. Whilst team members have high conformity to the organization, transactional leaders are expected to provide clear commands and expectations (Cherry, 2020a).

Though Cherry (2020a) believes that transactional leadership can be effective, especially in managing crises such as the COVID-19 pandemic, because such a leadership approach falls short on encouraging the subordinates to take initiatives, some scholars have considered it a *prescription for mediocrity* (Bass, 1990, p. 20).

Transformational Leadership. In contrast, transformational leaders broaden and elevate the interests of their employee. They generate awareness and acceptance of the purposes and mission of the group, and they stir their employees to go beyond their self-interest for the good of the group (Bass, 1990).

As illustrated in Figure 2, it is widely understood that transformational leadership consists of four major components – *inspirational motivation*, *idealized influence*, *intellectual stimulation*, and *individualized consideration* (Bass, 1990, 1999; Stewart, 2006; Waasdijk, 2020).

More specifically, transformational leaders identify and articulate a clear vision for the team that they lead, and communicate with their followers to foster acceptance of the organizational goals; they lead by demonstrating an appropriate model, set and hold high performance expectations, and provide individualized support when necessary (Diaz-Saenz, 2011). As a result, such a style of leadership is usually characterized by the positive effects or results it brings about in the organization (Yukl, 1989).

Intellectual Styles and Leadership Styles: An Under-Studied Perspective

As intellectual styles and leadership styles are two of the most discussed topics in both the academic and practitioner literature, the connection between the two is particularly worthy of more discussion. Therefore, informed by the literature reviewed above, this study explored the connection between the threefold model of intellectual styles and leadership styles.

First of all, the existing literature that has directly discussed the connection between the two concepts is extremely scarce. For example, the keywords “intellectual styles and leadership styles” are entered in the renowned academic database ProQuest [Electronic Resources], no article

can be found that addresses such a topic directly. However, there have been attempts to investigate in this direction that have focused on more specific style constructs encompassed in Zhang and Sternberg’s (2005) threefold model of intellectual styles, such as personality, decision-making styles, learning style, and so forth, such as in publications by Lilly (1990), Park (1996), and Nazem and Amjadi (2014).

Adopting the situational leadership model developed by Hersey and Blanchard (1988) and dividing leadership into task- and relationship-focused behaviors, Lilly (1990) examined how learning styles and leadership styles affected the selection of instructional strategies in a nursing faculty; however, the research primarily focused on the effectiveness of instructional strategy selection rather than on how learning styles and leadership styles interrelated with one another. Park (1996) conducted a study to examine the relationship between gender role, decision-making style, and leadership style. In that project, the researcher used the framework for decision-making styles developed by Rowe and Mason (1987), as illustrated in Table 2, which categorizes leadership styles into a task- and relationship-orientation model. Through this study, the researchers discovered that individuals with a directive and analytical decision-making style are more task-oriented and therefore more transactional, and that those with a conceptual and behavioral decision-making style are more oriented towards relationships and hence more transformational (Park, 1996).

Table 2

Four Decision-Making Styles

Decision Style	Descriptors
Directive	Practical, authoritarian, impersonal and power-oriented
Analytical	Intellectual, impersonal and control oriented
Conceptual	Insightful, enthusiastic, personal, adaptive and flexible
Behavioral	Sociable, friendly and supportive

Note. From Rowe and Mason (1987), as cited in “Gender Role, Decision Style and Leadership Style,” by D. Park, 1996, *Women in Management Review*, 11(8), pp. 13–17 (<https://doi.org/10.1108/09649429610148737>).

The Conceptual Framework

Informed by the literature reviewed above, this study proposed the conceptual framework displayed in Table 3 to combine the two theories to further examine how they relate to one another.

Type I and II Intellectual Styles VS Transformational and Transactional Leadership

In terms of intellectual styles, most transformational leaders fall into Type I, the creative styles. As reviewed above and shown in Table 4, transformational leaders need to be equipped with a high degree of cognitive complexity, so as to be able to understand and preach the vision and goals of the organization and to provide intellectual stimulation to their followers. They also

intend to allow for more empowerment and autonomy and not to care much about conformity. They need to be intuitive and think divergently, so that they can be aware of the feelings and needs of their followers and give them individualized consideration. They are more creative and innovative, so much so that they can advocate for and bring about change. Moreover, they need to be holistic thinkers.

Table 3

Comparison of Intellectual Styles and Leadership Styles

<p>Inspirational motivation</p> <ul style="list-style-type: none"> - communicates high expectations - uses symbols to focus efforts - expresses important purposes in simple ways <p>Idealized influence/charisma</p> <ul style="list-style-type: none"> - provides vision and sense of mission - instills pride - gains respect and trust <p>Intellectual stimulation</p> <ul style="list-style-type: none"> - promotes intelligence, rationality, and careful problem-solving <p>Individualized Consideration</p> <ul style="list-style-type: none"> - gives personal attention - treats each employee individually - coaches - advises 	<p>Contingent rewards:</p> <ul style="list-style-type: none"> - contracts exchange of rewards for effort - promises rewards for good performance - recognizes accomplishments <p>Management by exception (active):</p> <ul style="list-style-type: none"> - watches and searches for deviations from rules and standards - takes corrective action <p>Management by exception (passive):</p> <ul style="list-style-type: none"> - intervenes only if standards are not met
<p>Transformational leadership ←==→ Transactional leadership</p>	

	Type I <i>The creative styles</i>	Type II <i>The analytical styles</i>
Degree of structuring	Low	High
Degree of cognitive complexity	High	Low
Conformity	Low	High
Degree of control (autonomy – authority)	Low	High
Personality type	Intuitive, perceiving	Sensing, judging
Mode of thinking	Holistic	Analytic
Decision-making style	Innovation	Adaptation
Structure of intellect	Divergent thinking	Convergent thinking
Thinking style	Legislative, judicial, global	Executive, local, conservative, monarchic

On the other side of the spectrum, transactional leaders are more complementary with the Type II intellectual styles under Zhang and Sternberg’s (2005) threefold model. Instead of facilitating change, transactional leaders care much more about maintaining the status quo and having the subordinates work to fulfill pre-established performance standards or expectations. In order to do so, they are much more structuralized individuals with much more emphasis on conformity to the organization and control over subordinates. In contrast to transformational leaders, who are divergent, legislative, judicial, and global in thinking, transactional leaders are more convergent, executive, conservative, and local thinkers (Zhang & Sternberg, 2005).

Hypothesis

H1: Principals’ transformational leadership has positive effects on Type I thinking styles in terms of teaching components.

H2: Principals' transactional leadership has positive effects on Type II thinking styles in terms of teaching components.

Methodology

Participants

This study investigated 967 middle school teachers from four cities in one province in China. Convenience sampling was used in this study. In China, principals are required to regularly participate in professional development programs for school principals. A questionnaire survey was conducted to collect data from the schools where a group of principals participating in such professional development had worked between April 2020 and July 2020. Teachers were informed that no incentive would be provided and that they could choose whether to respond to the questionnaire voluntarily. The number of teacher gender was 61.9% female (599) and 38.1% male (368). The teaching experience of participants broke down as follows: 207 teachers (21.4%) had taught for 3 years or less, 195 (20.2%) had taught for 3–5 years, 184 (19.0%) had taught for 6–10 years, 145 (15.0%) had taught 11–15 years, 130 (13.4%) had taught 16–19 years, and 106 (11.0%) had taught for 20 years or more.

Instruments

Two scales made up the questionnaire used in the study: the Multifactor Leadership Questionnaire (MLQ) and the Thinking Styles Inventory in Teaching (TSIT).

The 45-item MLQ adapted from Avolio and Bass (2004) contains five transformational, three transactional, one laissez-faire, and three outcome scales. This research used five dimensions of transformational leadership (TSL), including inspirational motivation (TLIC), idealized influence attributed (TLA), idealized influence behavior (TLB), intellectual stimulation (TLIS) and individualized consideration (TLIC), and two dimensions of transactional leadership (TCL), including contingent reward (CR) and management-by-exception active (AM). Teachers rated each item on a 7-point scale ranging from *not at all well* to *extremely well*.

The 49-item TSIT was adapted from Grigorenko and Sternberg (1993) and was designed to assess seven teaching styles. Type I styles included global, judicial, legislative, liberal teaching styles, and Type II styles included conservative, executive, and local teaching styles. Item examples were “I like students to plan an investigation of a topic that they believe is important” and “I think that teachers must increase the conceptual as opposed to the factual content of their lessons.” Teachers were asked to rate each item on a 7-point scale ranging from *not at all well* to *extremely well*.

Analysis

SPSS 23.0 and Mplus 8.1 software were used to analyze the data. The descriptive statistics and correlations were conducted using SPSS, and structural equation modeling (SEM) was conducted using Mplus. The chi-square statistic (χ^2), root mean square error of approximation (RMSEA), comparative fit index (CFI), and standardized root mean square residual (SRMR) were employed to indicate the robustness of fit in CFA and SEM analysis. Model fit was deemed

acceptable with RMSEA <.1, CFI > .90, and SRMR < .08 (Browne & Cudeck, 1993; Hu & Bentler, 1999).

Reliability and Construct Validity of the Scales

The results showed that all of the factors had acceptable reliability coefficients, with Cronbach’s alpha coefficients ranging from .76 to .92 (see Table 4). The construct validity of each scale showed that both the TSL ($\chi^2/df=83.51$, $p<.01$, RMSEA=.08, CFI=.94, SRMR=.03), TCL ($\chi^2/df=104.07$, $p<.01$, RMSEA=.05, CFI=.99, SRMR=.03), Type I ($\chi^2/df=57.95$, $p<.01$, RMSEA=.08, CFI=.91, SRMR=.05), and Type II ($\chi^2/df=58.13$, $p<.01$, RMSEA=.08, CFI=.92, SRMR=.05) fitted the data very well.

Table 4

Descriptive Statistics, Cronbach’s a, and Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1TLIC	1													
2TLIM	.81 **	1												
3TLIS	.84 **	.83 **	1											
4TLA	.84 **	.91 **	.83 **	1										
5TLTB	.80 **	.90 **	.79 **	.88 **	1									
6AM	.80 **	.79 **	.80 **	.81 **	.81 **	1								
7CR	.85 **	.83 **	.86 **	.85 **	.83 **	.83 **	1							
8T1Global	.43 **	.47 **	.46 **	.41 **	.46 **	.42 **	.45 **	1						
9T1Judicial	.51 **	.54 **	.54 **	.49 **	.53 **	.52 **	.52 **	.81 **	1					
10T1Legislative	.42 **	.47 **	.45 **	.42 **	.46 **	.41 **	.44 **	.73 **	.78 **	1				
11T1Liberal	.42 **	.49 **	.45 **	.44 **	.48 **	.43 **	.45 **	.79 **	.82 **	.77 **	1			
12T2Conservative	.37 **	.29 **	.37 **	.27 **	.29 **	.39 **	.37 **	.39 **	.46 **	.3**	.33 **	1		
13T2Executive	.32 **	.19 **	.3**	.21 **	.18 **	.34 **	.32 **	.23 **	.33 **	.15 **	.18 **	.68 **	1	
14T2Local	.47 **	.41 **	.47 **	.37 **	.39 **	.48 **	.47 **	.59 **	.67 **	.52 **	.53 **	.69 **	.6**	1

α	.80	.92	.83	.94	.88	.79	.85	.81	.85	.87	.79	.77	.76	.80
M	4.7	5.2	4.7	5.1	5.2	4.8	4.8	5.4	5.3	5.7	5.5	4.5	4.1	4.8
	2	2	9	1	3	1	5	4	8	1	5	1	3	7
SD	1.2	1.2	1.2	1.3	1.2	1.1	1.2	0.9	0.9	0.9	1.0	1.0	1.1	0.9
	7	7	5	6	2	3	1	9	0	3	1	2	8	8
AVE	0.6	0.7	0.6	0.7	0.7	0.6	0.6	0.6	0.4	0.6	0.6	0.5	0.5	0.4
	0	9	3	1	1	0	1	0	9	0	1	6	1	6
CR	0.8	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.8
	1	2	4	0	8	1	6	1	5	8	2	9	6	0

Note. ** $p < .01$

Findings

Descriptive Statistics and Correlations

The descriptive statistics and correlations are displayed in Table 1. Among the five factors of transformational leadership, idealized influence behavior had the highest score ($M=5.23$, $SD=1.22$), followed by inspirational motivation ($M=5.22$, $SD=1.27$), idealized influence attributed ($M=5.11$, $SD=1.36$), intellectual stimulation ($M=4.79$, $SD=1.25$), and individualized consideration ($M=4.72$, $SD=1.27$). For the two elements of transactional leadership, contingent reward scored 4.85 ($SD=1.21$) and management-by-exception active scored 4.81 ($SD=1.13$). Teachers reported higher scores in Type I than in Type II thinking styles in their teaching. Specifically, teachers scored 5.71 ($SD=0.93$) in the legislative thinking style, 5.55 ($SD=1.01$) in the liberal thinking style, 5.44 ($SD=0.99$) in the global thinking style, and 5.38 ($SD=0.90$) in the judicial thinking style. Type II teaching thinking styles scored highest in local style ($M=4.87$, $SD=0.98$), conservative style ($M=4.51$, $SD=1.02$), and executive style ($M=4.13$, $SD=1.18$).

In terms of the correlations among the factors, factors of Type I thinking styles had a higher correlation with transformational leadership' factors ($r=0.41\sim 0.54$) than with transactional leadership' factors ($r=0.41\sim 0.52$), while factors of Type II had a higher correlation with transactional leadership' factors ($r=0.32\sim 0.48$) than with transformational leadership's factors ($r=0.18\sim 0.47$).

SEM Results

Two models were set up to examine the relationships between transformational leadership and Type I thinking style components, and between transactional leadership and Type II thinking style components. The SEM results showed that model1 (see Figure 1) ($\chi^2/df=57.34$, $p < .01$, $RMSEA=.07$, $CFI=.92$, $SRMR=.04$) and model2 (see Figure 2) ($\chi^2/df=55.37$, $p < .01$, $RMSEA=.07$, $CFI=.93$, $SRMR=.06$) had a good data fit. The results are displayed in Figure 1 and Figure 2.

The results in Figure 1 show that transformational leadership had significant effects on all four elements of Type I thinking style components. Specifically, teacher perception of principal's transformational leadership significantly predicted their judicial ($\beta=.61$, $p < .05$), liberal ($\beta=.55$, $p < .05$), global ($\beta=.53$, $p < .05$), and legislative ($\beta=.52$, $p < .05$) styles in teaching. Therefore, H1 was supported.

The results in Figure 2 show that transactional leadership had significant effects on all three elements of Type II thinking style components. Specifically, teacher perception of principal's transactional leadership significantly predicted their local ($\beta=.58, p<.05$), conservative ($\beta=.42, p<.05$), and executive ($\beta=.41, p<.05$) styles in teaching. Therefore, H2 was supported.

Figure 1

Effects of Transformational Leadership on Type I Thinking Styles

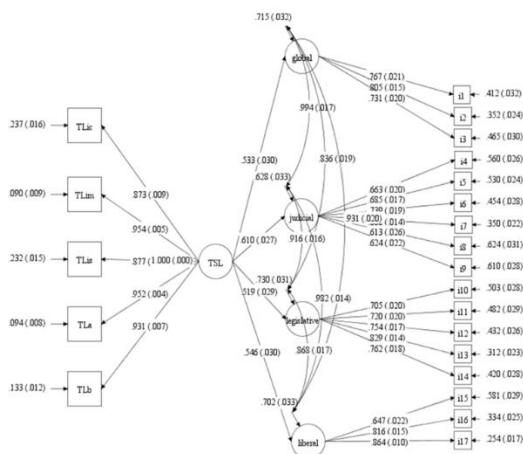
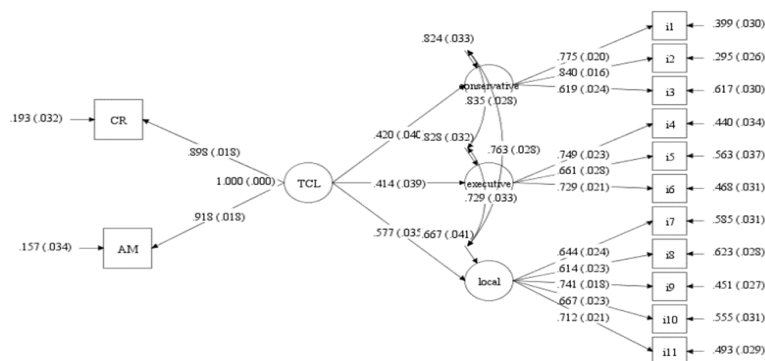


Figure 2

Effects of Transactional Leadership on Type II Thinking Styles



Discussion, Conclusions, and Suggestions

The findings suggest there is a positive relationship between perceived transformational leadership behavior and teacher self-perceived intellectual style I. Transformational leadership is a kind of leadership in which leaders and followers raise their morale and motivation to higher levels through helping each other (Bass, 1985; Leithwood & Sun, 2012). Transformational leaders need to have more cognitive complexity because they have to deal with more challenging situations compared with other leaders. For instance, transformational leaders have to transform

schools from low performance to high-performance status, and will therefore experience many difficulties and challenges like low teachers' morale and insufficient resources. Transformational leaders have to give individualized consideration to the needs of each of their subordinates in education practice (Kwan, 2020). They need to empower teachers with loosely structured organization and give teachers more autonomy for effective change. These characteristics match with key characteristics of Type I intellectual styles, which are low structure, high complexity, and low control. This matches the school-based management and recent education reform in the Chinese educational context, which have focused on empowering teachers (Author, 2019). This finding supports the Author's (2015) research, which found that transformational leadership can effectively motivate teachers to be part of a school change process. This finding echoes that Intellectual style I focuses on creativity (Zhang, L.-f., & Sternberg, 2005; Zhang, 2013). Hence, this study confirms that perceived leader's transformational leadership style has a positive relationship with followers' intellectual style.

Another important finding of this study was that there is a positive relationship between transactional leadership perceived by teachers and teachers' intellectual style II. Transactional leadership focuses on exchanging benefits between leaders and followers and promising benefits (Antonakis & House, 2014). The purpose of this kind of leadership is not long-term change. This matches the characteristics of intellectual style Type II, which features high structure, low cognitive complexity, high conformity, and high control (Zhang & Sternberg, 2005; Zhang, 2013). This means that transactional leaders require teachers to follow their orders and are inclined to highly control teachers' behaviors. The finding also indicates that follower-perceived transactional leadership can positively predict Type II intellectual style. This finding reflects the practice in the Chinese educational context of using transactional leadership practices to sustain a short period of hard but uncreative work. This management method requires teachers only to work hard under strict rules, which reduces the teachers' creativity and their courage to conduct creative work. This study also echoes Zhang & Sternberg (2005) and Zhang (2013) that Type II is more Analytical. This finding, accordingly, reports a positive relationship between leaders' transactional leadership, as perceived by teachers, and teachers' own intellectual style Type II.

The findings of this study have multifold implications. First, administrators need to demonstrate their transformational leadership style, so teachers can be more easily engaged in the school change process. School administrators also need to enrich their knowledge, so that they can handle complicated situations effectively. Another important point is that it is wise for school administrators to empower teachers through engaging them in decision making. It is then easier for teachers to be motivated to be part of the change process. Finally, school administrators need to go beyond high organizational control and limitations on the autonomy of teachers. This will contribute to effective change in the school organization.

Limitations

This study was mainly limited by its scope and its theoretical framework. This research focused on the relationship between leadership style and intellectual style Type I and Type II but did not explore the leadership effects of Type III.

Future studies

In future, expanding the scope of this research to other research contexts, including higher education contexts and international contexts, will help further understand this relationship. In addition, further research might focus on exploring the relationships between other leadership styles, such as distributed leadership and teacher leadership, and teachers' intellectual style. Further understanding of the relationship between leadership styles and type III intellectual style will also contribute to the research in this field.

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