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Assessing instructional leadership from two mindsets in China: power distance as a moderator

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Abstract

The past decade has witnessed growing interest in the study of the perceptual differences between principals and teachers, and a number of inconsistent results have been documented. This study examined differences between principals' and teachers' perceptions of principal instructional leadership and tested the hypothesis that power distance (PD) moderates the differences between the two parties. Based on survey data collected from 132 Chinese principals and 1708 teachers, the results revealed no significant differences in the total and dimensional levels of instructional leadership; however, PD moderated the perceptual differences. Specifically, when the principals reported a low PD, their self-ratings of their instructional leadership were higher than the teachers' ratings, and conversely, when the principals reported a high PD, their self-ratings were lower than the teachers' evaluations. However, the result was contrary to the hypothesis when PD was reported by teachers. The theoretical and practical implications are discussed.

Keywords Instructional leadership · Perceptual differences · Power distance

Since the turn of the new millennium, there has been increasing pressure for standard-based accountabilities related to student achievement and creating effective conditions for student learning (Cheng 2003; Hallinger 2005; Hanushek and Raymond 2005; Silva et al. 2011). School principals are once again under the spotlight to facilitate effective teaching and learning. As the most noticeable leadership approach to improving schools' teaching and learning capacities, instructional leadership has drawn another

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wave of attention in the research literature (e.g. Leithwood et al. 2006; Robinson et al. 2008; Hallinger 2011). Not surprisingly, instructional leadership has become a distinct and important component of standards for principals, evaluations of principals and principal preparation and development programmes around the world (Catano and Stronge 2007; Hallinger 2005).

In the past three decades, collecting principal leadership information from multiple sources, especially from principals and teachers, has gained widespread acceptance in education. Empirical studies have consistently recorded the general lack of convergence between principals' self-ratings of their own instructional leadership and those provided by teachers, with principals frequently providing higher self-ratings than teachers (e.g. Goff et al. 2014; Hallinger and Murphy 1985; Henderson 2007; San Nicolas 2003; Smith 2007; Vinson 1997). Recent studies on differences in principal–teacher leadership ratings have shown that greater principal–teacher rating differences often indicate less effective principals and a lower quality of communication and interaction between principals and teachers (Goff et al. 2014; Park and Ham 2014; Sinnema et al. 2015). The feedback on principal–teacher rating differences can help trigger a principal's motivation for improvement (Goff et al. 2014; Smither et al. 2005; Sinnema et al. 2015).

However, it is unclear whether the same pattern of differences in principal–teacher ratings of instructional leadership will occur within the education reform context of China, a school system and societal context vastly different from those in the West. This study does not merely replicate the Western phenomenon using Chinese samples, but also includes power distance (PD) as a potential moderator. Given that most studies of perceptual disparities in instructional leadership have been conducted in the USA, it is reasonable to argue that culture is a potentially influential factor. Thus, when we turn to principal leadership in China, where principal–teacher interactions are based on different societal norms (Antoniou and Lu 2017; Hallinger 2016; Walker et al. 2012), we expect different research findings.

This study aimed to (1) verify whether Chinese samples show the same significant differences between principals' and teachers' perceptions of principal instructional leadership as those found in the West and (2) test PD as a possible cultural explanation for the potentially different results. This study contributes to the literature in at least two ways. First, Chinese principals' and teachers' perceptions of instructional leadership are largely unknown. Our findings regarding principals' and teachers' perceptual differences of principals' instructional leadership fill this void. Second, PD has often been claimed to underpin principal–teacher interactions in the Chinese context, but it has rarely been tested. The inclusion of PD in this study provides an empirical test of the cultural assumptions related to potentially different results in Chinese schools.

1 Literature review

1.1 Focusing on instructional leadership

Instructional leadership, which is conceived as a role carried out by the school principal to improve teaching and learning (Hallinger 2005), has been a major leadership construct in literature since the 1980s. Despite the emergence of alternative approaches to school leadership, few have been more central, well-studied or vital than

instructional leadership (Hallinger and Heck 1996; Hallinger 2005; Leithwood et al. 2010; Robinson et al. 2008). Indeed, instructional leadership has been a critical factor in promoting the quality of education and a core force in school development (Hallinger and Wang 2015). More specifically, the positive effects of instructional leadership on improving students' academic learning outcomes have been consistently confirmed (Blase and Blase 1999; Hallinger and Leithwood 1994; Hallinger and Heck 1996; Hallinger 2003; Leithwood et al. 2006; Printy 2008; Robinson et al. 2008). Therefore, the value of instructional leadership for promoting teaching and learning cannot be ignored if students are expected to achieve satisfactory learning outcomes.

The operationalisation of instructional leadership proposed by Hallinger and Murphy (1985) is probably most commonly used in empirical investigations. They proposed that instructional leadership comprises three dimensions: (a) defining the school's mission; (b) managing the instructional programme; and (c) promoting a positive school learning climate (Hallinger and Murphy 1985). There are 10 functions of instructional leadership under these three dimensions (see Table 1). The first dimension is vital for principals as it ensures that schools have a clear learning-focused mission. An academically focused school mission distinguishes effective school goals from vague, poorly defined and even non-academic objectives. The second dimension requires the principal to focus on managing the professional core of teaching in the school. A principal's enactment of his or her role to improve teaching and learning helps to ensure that teachers focus on teaching and solving relevant problems. It also reflects the school's mission from the first dimension by creating a learner-centred learning environment for students. The third dimension broadens the range of the specific curriculum to create a learning environment at the school level, making continuous progress towards alignment with the school's mission and practice (Heck et al. 1990). In this way, principals wield soft power to boost teachers' professionalism and professional development, raise learning and teaching standards and provide motivation for students. Based on this operationalisation of instructional leadership, Hallinger and Murphy (1985) developed the Principal Instructional

Table 1 PIMRS Theoretical Framework

Dimensions	Functions
A. Defining the school mission	1. Frames the school's goals
	2. Communicates the school's goals
B. Managing the instructional programme	3. Coordinates the curriculum
	4. Supervise and Evaluate instruction
	5. Monitors student progress
C. Developing the school learning climate	6. Protects instructional time
	7. Provides incentives for teachers
	8. Provides incentives for learning
	9. Promotes professional development
	10. Maintains high visibility

Adapted from Hallinger and Murphy (1985)

Management Rating Scale (PIMRS), a convenient and valid tool for accessing principal instructional leadership, which is also the model used in the current study.

For policymakers, the emphasis on improving the quality of education in terms of student academic achievement has once again become imperative. As one method of ensuring that students achieve better learning outcomes, the accountability policy for schools has brought about mandatory evaluations of principals and teachers with strict standards required for student learning outcomes (Murphy and Shipman 2003; Silva et al. 2011). Failure to improve student learning has even resulted in the replacement of school leaders (Abrevaya and White 2009; Sebastian and Allensworth 2012). Consequently, school leadership, focused on teacher instruction and student learning, has become a necessity instead of a choice (Murphy and Meyers 2007; Nettles and Herrington 2007; Silva et al. 2011).

Instructional leadership is a major component of the standards for principal leadership. The USA pioneered the creation of principal leadership standards (Fu and Xiong 2010). The latest version, the 2014 Interstate School Leaders' Licensure Consortium (ISLLC), was designed to 'place great emphasis on the instructional leadership responsibilities of school and district leaders and provide a common vision for effective educational leadership' (CCSSO 2014, p. 23). Instructional leadership has been positioned as a future direction for principal development. In China, the government has enacted 'Professional Standards for Compulsory Education School Principals', which officially designate instruction-related functions such as 'leading curriculum and instruction' and 'promoting teacher development' as the major criteria for recruiting new principals and assessing principals' performance (MOE 2013). The setting of standards for principal leadership practice around instruction suggests that the central position of instructional leadership in overall school development is recognised in China (Zhang 2014; Zhao and Song 2014).

1.2 Chinese educational context for instructional leadership

Although there have been ample studies on instructional leadership, particularly in the English-language literature, there is limited understanding of how it is practised in Chinese schools. One of the major reform thrusts in the new century has been the 'New Curriculum Reform', which has brought significant change to professional practices in schools (Ji 2011). Before its launch, the school system had been encumbered by traditional teacher-centred instruction (Cui and Wang 2006). The 'New Curriculum Reform' was expected to help transform the previous Chinese curriculum and push school leaders and teachers to put student learning at the centre of schooling. The requirements for instruction were not reduced or devalued, but raised to a higher level that demanded better quality and effective instruction.

To advance the new curriculum reform for high-quality education, in 2010, the Chinese government released the 'National Guideline for Medium- and Long-Term Educational Reform and Development (2010–2020)', which clearly stated that 'quality improvement is the core mission of educational reform and development' (MOE 2010). It further elaborated the importance of 'building a mechanism that promotes educational quality, allocates educational resources and centres the work priorities of schools to strengthen instruction and improve educational quality' (MOE 2010, chapter 1.2). The policy demanded that principals, as the chief instructional leaders, spend more time

and resources on the instructional issues of their schools. In terms of quality education in China, effective instructional leadership is needed to improve teaching and learning more than ever before.

Reshaped by the education reforms, the current Chinese educational system specifies a curriculum that transforms students from passive to active and helps them to become critical thinkers. Such goals cannot be achieved without effective instructional leadership. A growing number of Chinese scholars support the notion that instructional leadership is critical to sustaining a school's success. Zhang (2013) argued that principals should play a critical role in instruction to facilitate teachers' transition from the traditional way of teaching to the expectations of the 'New Curriculum Reform'. Zhang (2014) criticised principals who failed to be effective instructional leaders, thereby impeding the progress and quality of curriculum reform in their schools. Several other researchers have supported the view that insufficient instructional leadership also debases the professional development of Chinese principals (Liu 2010; Zhang 2013; Zhao 2013). Most Chinese school principals stepped into their positions after being teachers, but have failed to identify themselves as professional instructional leaders (Zhang 2013). Therefore, Chinese scholars have begun to realise that low-quality instructional leadership has become a critical issue that restricts Chinese principals' professional development and improvements to instructional quality (Zhao and Song 2014).

Empirical research on instructional leadership in China is in the initial stage (Ma and Wu 2013; Qian et al. 2017; Zhao and Song 2014). Qian et al. (2017) observed that 'the knowledge base concerning Chinese principals' leadership in general and their instructional leadership in particular are small and relatively immature' (p. 189). Zhao and Song (2014) found few academic discussions on instructional leadership in the Chinese social science citation index (CSSCI) database before 2004. The concept of instructional leadership was not widely known among Chinese academics until China's last major educational reform. However, it has gathered increasing attention within the past 5 years (Feng 2012; Qian et al. 2017; Zhao and Song 2014). Most research has consisted of theoretical reflections or introductions to the Western literature, and has shed limited light on the actual experiences of principal instructional leadership in China. The English-language literature also provides limited empirical evidence on instructional leadership practices among Chinese samples (Li et al. 2016; Qian et al. 2017), leaving the question of how Chinese principals practise instructional leadership unanswered. Despite the current paucity of knowledge on instructional leadership in Chinese schools, several researchers have predicted that more research attention will gradually concentrate on understanding Chinese principals' instructional practices (Ma and Wu 2013; Zhang 2013; Zhang 2014; Zhao and Song 2014), given the global interest in Chinese students' success on international tests (Walker and Qian 2015). Having established that the concept of instructional leadership requires more research attention in China, in the next part of the literature review, we specifically focus on the assessment of instructional leadership and the perceptual differences between principals and teachers.

1.3 The importance of investigating instructional leadership through two mindsets

Collecting feedback from oneself and others has become prevalent because it is associated with several important individual and organisational outcomes (Craig and Hannum 2006) and presumably generates more accurate evaluations than those derived

from self-ratings (Atwater et al. 1998). In applying the multiple-rater technique, rating gaps have often been reported among different raters, particularly between self and others (Atwater and Yammarino 1997; Atwater et al. 1998; Brutus et al. 1999; Johnston and Ferstl 1999; Ostroff et al. 2004; Sala 2003). Self–other rating agreement has been widely used to examine the effectiveness of leadership and its relevant outcomes (Fleenor et al. 2010). Specifically, when leaders' self-ratings disagree with the evaluations of their subordinates, their leadership is deemed less effective (Atwater and Yammarino 1992; Atwater et al. 1998; Park and Ham 2014; Urick and Bowers 2014). Halverson et al. (2002) argued that self–other ratings are the best indicators of leadership performance because they are 'follower-centred', and followers' perspectives are necessary and important for the assessment of leadership performance. With regard to principals' instructional leadership, Park and Ham (2014) noted that measuring the perceptual discrepancies between principals and teachers deserves more attention because teacher engagement and school capacity building can be negatively affected when there are wide differences in the perceptions of instructional leadership between principals and teachers. Data from both teachers and their principals manifest a more complete image of principal performance and also increase credibility and reliability (Smither et al. 2005).

The perceptions of both principals and teachers are commonly studied in the instructional leadership literature to better understand actual instructional leadership performance (e.g. Gurley et al. 2015; Henderson 2007; Jiang 2015; Park and Ham 2014). Empirical evidence has confirmed the existence of self–other rating differences and has consistently indicated that principals and teachers rate principals' instructional leadership differently (e.g. Hallinger et al. 2013). Further, the number of reported gaps between principals' and teachers' ratings of instructional leadership has grown. As early as 1985, Hallinger and Murphy reported that principals' self-ratings were slightly higher for all functions of instructional leadership than those given by teachers. The scholars concluded that the small difference could have been influenced by egocentric bias and the nature of self-reporting (Hallinger and Murphy 1985). Later studies either focused on the issue of rating differences or included them to capture a common result: the small differences have become increasingly salient. Principals' self-ratings are consistently higher than the evaluations of teachers (e.g. Gurley et al. 2015; Ratchaneeladdajit 1997; San Nicolas 2003; Stevens 1996; Waters 2005), and a large proportion of these differences are statistically significant (Chi 1997; Henderson 2007; Lorei 2015; Lyons 2010; Miller 1991; Smith 2007; Taraseina 1993). In addition to Western studies, studies conducted in other cultures have reported higher principal self-ratings than teacher evaluations (e.g. Ratchaneeladdajit 1997, in Thailand; Chi 1997, in Taiwan).

Goff et al. (2014) reported that principals' self-efficacy was a strong predictor of higher principal self-ratings. Their study identified rather large disparities between teachers' and principals' perceptions of leadership. Such gaps suggest that teachers have different information and perspectives on school leadership than principals. Henderson (2007) found that principals and teachers perceived principal instructional leadership differently due to their different belief systems. Principals tended to view instructional leadership in terms of how well they performed, whereas teachers perceived it according to how frequently they observed actual leadership behaviour. Principals tended to view their leadership behaviour as confidence in performing. The more confidence the principals had, the stronger they perceived their leadership

behaviour to be, regardless of whether their actual behaviour amounted to leadership. Interestingly, Goff et al. (2014) also reported that the more time teachers spent with principals, the less perceptual congruence the two groups achieved. This result implies that spending more time together does not equate to a higher quality of principal leadership.

Although principals rated themselves higher than teachers did in most studies, there are a couple of noteworthy exceptions with particular groups of principals (Rogers 2005; Sinnema et al. 2015). For example, Sinnema et al. (2015) found that principals who were older, had more years of experience in previous schools but less experience in their current school, and who worked in large schools, tended to rate themselves lower than the teachers rated them. The authors argued that these principals were overly modest and may have held higher standards for their own performance.

Based on this evidence, we are inclined to conclude that principals rate their own instructional leadership performance higher than teachers rate their performance. However, as Atwater et al. (2005) noted, knowledge of multi-source ratings in terms of self–other agreement and its relevant influence on the literature have largely been derived from US samples. More studies using samples from different cultures and countries in the field of education are needed. In the words of Dai et al. (2007), 'the need to understand multi-rater feedback processes has never been greater' (p. 3).

1.4 Self–other rating issues in Chinese principal instructional leadership

To date, there is little evidence in either the Chinese- or English-language literature on the differences between Chinese principals' and teachers' perceptions of instructional leadership. The study of curriculum leadership by Wang (2007) in China provides a useful reference point. Wang (2007) collected data from 67 principals and 772 teachers on their perceptions of principals' curriculum leadership. Significant differences were found on all eight dimensions. Specifically, the principals' self-ratings were substantially higher than the teachers' for professional support and acknowledgement, encouraging teachers' professional learning and discussing curriculum and instruction with teachers. Nearly half of the teachers rated their principals as occasionally (42.4%) or never (5.1%) providing professional support and advice. Wang (2007) argued that the gaps occurred because the principals believed they had done a great deal to lead the curriculum and instruction, whereas the other side did not agree and expected more from the principals.

Jiang (2015) adopted the PIMRS and collected perceptions of principal instructional leadership practices from three parties: the district deputy, principals and teachers at the high school level. No significant differences were found among them on any dimension or function. The results were surprising but still not convincing because the study sample only included eight schools, which was too small to allow the results to be generalised to more schools in China.

Given the existing evidence in China, we argue that the findings on curriculum leadership from Wang's (2007) study might also apply to instructional leadership, because managing the curriculum and improving teaching and learning are two distinct but closely related functional roles. Furthermore, the average size of a Chinese government-funded public school is larger than its counterpart in the USA, where most self–other agreement studies of instructional leadership have been conducted.

According to the idea of managerial span of control, school administrative structures in Chinese schools are likely to be more hierarchical than those in American schools. Indeed, in most Chinese schools, teachers are grouped in subject-based teaching-research groups (jiaoyanzu) as well as by grade (Qian et al. 2017). This also suggests that a junior Chinese teacher does not work directly with the principal on a daily basis. Another unique feature of the Chinese school context is that the Communist Party secretary is also a top leader in the school and may dilute the principal's instructional practice through participation in defining the school mission and building the school climate. Therefore, we propose that the same pattern of differences in principal–teacher ratings of instructional leadership will occur in China, and the magnitude of the difference will be greater.

> *Hypothesis 1*: Chinese principals' self-ratings of instructional leadership will be significantly higher than teachers' ratings of their instructional leadership.

1.5 PD as a potential moderator

In the school leadership and management literature, there is a growing consensus that sociocultural contexts shape school leadership practices (Clarke and O'Donoghue 2016; Hallinger 2016). In this respect, scholars and practitioners have been cautious when applying ideas derived from other sociocultural contexts to their own societies. Considering that most studies on perceptual (dis)agreement between principals and teachers on principal instructional leadership have been conducted in Western societies, we deemed it necessary to include a cultural factor in this study because it was conducted in China.

PD, a dimension of culture, refers to people's acceptance of unequally distributed power within a society (Hofstede 1980). The concept has been extensively studied at the societal level for cross-cultural comparison (House et al. 2004; Lian et al. 2012). Nonetheless, there is increasing interest in organisational- and individual-level PD orientation (e.g. Ackerman and Brockner 1996; Farh et al. 2007; Kirkman and Shapiro 2001; Kirkman et al. 2006; Kirkman et al. 2009). We propose PD as a moderator of the perceptual gap between principals and teachers for two reasons. First, as a nation, the PD index of Chinese culture is reported to be as high as 80 (Hofstede 2001), which indicates that people are inclined to respect authority and follow instructions from leaders. This is certainly the case for interactions between principals and teachers in Chinese schools, which adopt multiple-level, top-down and clearly defined hierarchies of power. Second, PD has been found to be one of the most effective sociocultural moderators in helping to explain possible variations in leadership findings in Chinese societies (Kirkman et al. 2009; Dickson et al. 2003; Dimmock and Walker 2005; Farh et al. 2007; House et al. 2004; Kirkman et al. 2006; Lian et al. 2012; Zhang and Begley 2011). The theoretical premise is that people with a high PD orientation are more concerned about the treatment they receive from authorities. Following this logic, we argue that PD may serve as a potential factor that influences the perpetual gap between Chinese principals' and teachers' perceptions of principals' instructional leadership.

In low PD situations, people tend to have stronger social connections with leaders. However, individuals prefer equal relationships and will initiate disagreements and

even voice criticisms, particularly with their supervisors (Tyler et al. 2000). Following this argument, it can be further elaborated that when PD is low, principals and teachers are inclined to establish more equal relationships and direct interactions. Principals may welcome different voices, and teachers may perceive more leadership behaviour from their principals but still dare to disagree. Therefore, the teachers' ratings are more likely to be lower than the principals' self-evaluations. In contrast, in a high-PD situation, people tend to be role-sensitive, to accept differences in power and show more deference and obedience to authority (Farh et al. 2007; Lin et al. 2013; Tyler et al. 2000). Thus, it can be inferred that when PD is high, teachers will treat their principals as authority figures and show them respect. Under this circumstance, teachers are more likely to rate their principals higher than the principals' own self-ratings. Alternatively, China's unique culture, in which principals value moral leadership (Wong 2001), may inspire them to have high expectations of themselves. In such a case, their ratings of their own instructional leadership might be lower than the teachers' ratings.

In summary, we argue that individual PD, as a cultural factor, should affect the perception gap between principals' and teachers' ratings of principal instructional leadership. Accordingly, the following hypothesis is proposed:

> *Hypothesis 2*: PD will moderate the difference between principals' and teachers' perceptions of instructional leadership, such that principals will rate themselves higher than teachers do when PD orientation is low (H2a), whereas principals will rate themselves lower than teachers do when PD orientation is high (H2b).

2 Method

2.1 Sample

All research participants were from Luoyang, Henan, a central province in China. Although this particular location was chosen due to convenience, the location of the sample selection was meaningful for several reasons. First, as one of the first experimental targets, Henan Province implemented the new curriculum reform in 2001 (MOE 2001). The principals and teachers in Henan had to meet the high instructional requirements of the new curriculum with limited experience, as did the other experimental cities and provinces, including Beijing and Shanghai. Thus, what happened in the Henan schools might also have occurred in other experimental schools. Second, because Henan is located in the middle of China, it has drawn much less research attention than the eastern coastal cities and western rural areas. The former are more developed and have better educational resources, whereas the latter are barren, both educationally and economically. Consequently, studies on the impact of the new curriculum reform in terms of instructional leadership in Henan samples have been rare. How principals in Henan have adjusted their instructional leadership practice to the new curriculum reform has barely been documented in the literature in this field.

The sample of principals and teachers in Henan should also be, to a great extent, representative of Chinese schools in general, and particularly those in the first batch of the new curriculum reform experiments. Henan's economy has generally been strong within China, ranking fifth since 1995 (National Bureau of Statistics 2016). Henan has

also hosted the largest student population at the compulsory education level in China. In 2015, there were as many as 13,418,600 students and 833,500 teachers in 29,200 schools, according to the official figures (The Education Department of Henan 2016). This has created a situation in which there are a high number of individuals, but economic development on average has been low. Only 4.26% of China's total gross domestic product went to fund its educational system in 2015 (MOE 2016), and 5.5% of this was allocated to Henan (National Bureau of Statistics 2016). Considering the low economic development, the large number of students and the financial support ratio, the situation in Henan is quite similar to the situation in China as a whole. Second, schools in Henan have operated in a more traditional way but have become more oriented towards students and quality. Conflicts related to teaching students and managing schools during the transition from the old to the new methods of schooling might be more problematic in Henan. Coastal cities such as Shanghai have already adjusted, whereas less-developed places have been struggling to implement the changes. Standing in the middle of change towards progress, the internal fluctuations of Henan's education system have been dynamic and diverse. Therefore, the educational status of Henan Province fulfils the research requirements of this study.

Luoyang is the second-largest city in Henan Province, and its local educational bureaus offered indispensable assistance to the research team in approaching targeted research samples. Fifteen districts were under the direct management of Luoyang, and at the beginning of every year, the school representatives from all 15 districts (generally principals or vice-principals) gather at the Luoyang City educational bureau for their annual meeting. With permission to attend such meetings, the research team was provided with opportunities to approach school delegates and promote the study. We explained to the school representatives that principals and teachers would be invited to participate in a survey. All of the questionnaires for the principal and teachers from the same school were placed into a bundle of envelopes with an invitation letter attached to the cover, briefly explaining the purpose of the study. Two hundred bundles of envelopes were prepared and distributed to the representatives of the schools that had agreed to participate. All bundles of sealed envelopes were mailed directly back to the researcher using pre-addressed, receiver-paid envelopes. Although sampling in Luoyang was due to convenience, the selection of schools and participation of the principals and teachers were random and based on their free will.

In total, 156 bundles of envelopes were received from the participants, representing a response rate of 78%. However, 24 schools had to be removed from the data analysis due to several problems: the surveys of either the principal or the teachers were missing; one survey had more than 10% missing data; and others contained repetitious answers. One hundred thirty-two schools qualified for further data analyses, comprising data from 132 principals and 1708 teachers. On average, each principal oversaw about 13 teachers. In considering an effective sample size, Fraenkel et al. (1993) suggested that 'a sample of at least 50 is deemed necessary to establish the existence of a relationship' (p. 109). Their statement was supported by Hox and Maas (2001), who proposed that a group of samples (e.g. nested schools) should contain at least 50 and that the number of outcome participants (teachers) should be at least 5. Therefore, the sample size (132) and ratio of nested data (13) collected in this study met the requirements for data analysis.

2.2 Instruments

This study adopted the PIMRS developed by Hallinger and Murphy (1985). The instrument has been used in international research on school leadership and relevant factors over the past 30 years (Hallinger 2008, 2011; Lee et al. 2012; Neumerski 2013) and has continued to evolve (Hallinger et al. 2013). The scale has consistently been proven to be both reliable and valid (Hallinger et al. 2013), and previous studies that have adopted the PIMRS in greater China have also shown high reliability and validity (e.g. Zhao and Song 2014). The results produced by the PIMRS are comparable with those of other international studies.

Data were collected using the short-form teacher version of the PIMRS, which was designed to increase data collection efficiency. Although filling out the 50 questions on the PIMRS is not time-consuming for one person, such as a principal or supervisor, time can be an issue when distributing the instrument to a large number of teachers or in combination with other measurements. Including the 50 items from the PIMRS, teachers can easily be faced with a large survey of more than 100 questions when one or more instruments are combined (e.g. measurements of commitment, efficacy and job satisfaction). Fewer items can reduce the time costs of data collection and allow greater time efficiency if the short version of the PIMRS still provides high reliability and validity. The developers of the PIMRS successfully reduced the 50-item instrument to 22 questions in the short-form version for teachers and demonstrated that it remained both reliable and valid (Hallinger and Wang 2015).

The individual PD orientation of the principals and teachers was measured by Dorfman and Howell's (1988) six-item scale with a five-point Likert response scale. The scale has been applied to many studies in the Chinese context by both Chinese and Western scholars, producing reliable and valid results (Farh et al. 2007). We slightly rephrased the items to make them more appropriate for a school setting. Participants were asked to indicate the extent to which they agreed with statements such as 'Teachers should not disagree with school management decisions' and 'It is frequently necessary for a principal to use authority and power when working with teachers'. Individual PD orientation was measured as the mean of a participant's responses to the six PD items. Because the research purpose of this study was to test the perception gap between principals and teachers, we collected individual PD orientation from both principal and teacher participants.

3 Data analysis and results

As a recommended standard procedure, Hallinger and Wang (2015) suggested that all researchers who apply the PIMRS should perform a validation analysis, even though the scale has been proven to be both reliable and valid. We assessed the reliability of the scale using Cronbach's α calculated in SPSS (version 21) and the content validity using confirmatory factor analysis in Mplus (version 7). Both the reliability and validity results (Tables 2 and 3) satisfied the requirements (Browne and Cudeck 1993; Hu and Bentler 1999; Steiger 1990).

The results of the paired-samples t tests are presented in Table 4. Both principals and teachers gave the highest ratings to the dimension of defining the school's vision

Table 2 Cronbach's α reliability results

Principal (n = 132)	PIMRS 50 items = 0.937
	Defining the school mission (dimension 1) = 0.858
	Managing the instructional programme (dimension 2) = 0.854
	Developing the school learning climate (dimension 3) = 0.888
	PIMRS 22 items = 0.900
	Defining the school mission (dimension 1) = 0.768
	Managing the instructional programme (dimension 2) = 0.763
	Developing the school learning climate (dimension 3) = 0.825
	Power distance = .781
Teacher (n = 1708)	PIMRS 22 items = 0.928
	Defining the school mission (dimension 1) = 0.811
	Managing the instructional programme (dimension 2) = 0.795
	Developing the school learning climate (dimension 3) = 0.910
	Power distance = 0.826

(principals, $M = 4.270$; teachers, $M = 4.264$) and the lowest ratings to the dimension of developing the school learning culture (principals, $M = 4.046$; teachers, $M = 4.017$). However, there was no significant difference between principals' self-ratings and those given by the teachers for overall instructional leadership (principals, $M = 4.110$; teachers, $M = 4.110$, $p =$ n.s.) or any of its dimensions. Specifically, principals' self-ratings were close to those given by the teachers on defining the school vision (principals, $M = 4.270$; teachers, $M = 4.264$, $p =$ n.s.), managing the instructional programme (principals, $M = 4.074$; teachers, $M = 4.089$, $p =$ n.s.) and developing the school learning climate (principals, $M = 4.046$; teachers, $M = 4.1017$). Thus, the first hypothesis was rejected.

To test the second hypothesis, the participants were categorised into four subgroups through a combination of PD (high and low) and role (principals and teachers). A paired t test was performed to compare the principals' and teachers' perceptions of principal instructional leadership when PD was controlled. The principals' perception of PD ($M = 1.980$) was significantly lower than that of the teachers ($M = 2.299$, $t = -16.717$, $p < 0.001$). There was also a small, positive correlation between the PD ratings of the principals and teachers ($r = 0.173$, $p < 0.001$). The mean scores suggest that in general, the principals tended to perceive their relationships with teachers as 'close', but the teachers regarded the principals as more distant. However, the correlation result suggested a low level of agreement between the principals and teachers on the preferred pattern of principal–teacher interaction, and thus, they needed to be treated separately.

The detailed results in the following paragraphs are summarised in Table 5 and illustrated in Figs. 1 and 2. When the principals reported higher PD ($M \geq 1.980$), their self-ratings were significantly lower than those given by the teachers on the dimensions

Table 3 CFA Results for construct validity of PIMRS

	Chi-square	p value	RMSEA	CFI	TLI
Principals (n = 132)	353.013	0.0000	0.074	0.942	0.935
Teachers (n = 1708)	2883.660	0.0000	0.090	0.941	0.929

Table 4 *T* test results of dimensions and overall scores between principals' self-rating and teachers' evaluations

Variables	Mean/SD		*N*	*T*	DF	SIG
	Principals	Teachers				Hypothesis supported or not
D1: defining the school vision	4.270/.454	4.264/.550	1708	0.383	1707	0.702 No
D2: managing the instructional programme	4.074/.449	4.089/.560	1708	− 0.907	1707	0.365 No
D3: developing the school learning climate	4.046/.450	4.017/.596	1708	1.766	1707	0.078 No
Overall: principal instructional leadership	4.110/.394	4.106/.503	1708	0.706	1707	0.480 No

of defining the school vision (principal, $M = 4.201$; teacher, $M = 4.258$; principal–teacher rating difference $= − 0.057$; $p < 0.01$), managing the instructional programme (principal, $M = 3.965$; teacher, $M = 4.079$; principal–teacher rating difference $= − 0.114$; $p < 0.001$), and overall PIMRS score (principal, $M = 4.026$; teacher, $M = 4.089$; principal–teacher rating difference $= −0.063$; $p < 0.01$), although there was no significant difference on the dimension of developing the school learning culture (principal, $M = 3.981$; teacher, $M = 4.011$; principal–teacher rating difference $= − 0.03$; $p = $ n.s.). When the principals reported low PD ($M < 1.980$), their self-ratings were significantly higher than those given by the teachers on the overall PIMRS score (principal, $M = 4.212$; teacher, $M = 4.106$; principal–teacher rating difference $= 0.106$; $p < 0.001$) and each of its dimensions. Specifically, principals' self-ratings were higher than teachers' ratings on the dimensions of defining the school vision (principal, $M = 4.361$; teacher, $M = 4.271$; principal–teacher rating difference $= 0.009$; $p < 0.001$), managing the instructional programme (principal, $M = 4.218$; teacher, $M = 4.102$; principal–teacher rating difference $= 0.116$; $p < 0.001$) and developing the school learning climate (principal, $M = 4.132$; teacher, $M = 4.025$; principal–teacher rating difference $= 0.107$; $p < 0.001$).

However, when the PD reported by the teachers was high ($M \geq 2.299$), the principals' self-ratings were significantly higher than the teachers' ratings on the overall PIMRS score (principal, $M = 4.118$; teacher, $M = 4.064$; principal–teacher rating difference $= 0.054$; $p < 0.05$) and on the dimensions of defining the school vision (principal, $M = 4.275$; teacher, $M = 4.209$; principal–teacher rating difference $= 0.066$; $p < 0.01$) and developing the school learning climate (principal, $M = 4.054$; teacher, $M = 3.997$; principal–teacher rating difference $= 0.057$; $p < 0.01$). When the teachers reported low PD ($M < 2.299$), there was no significant difference between the overall PIMRS scores of principals and teachers (principal, $M = 4.095$; teacher, $M = 4.124$; principal–teacher rating difference $= 0.029$; $p = $ n.s.). However, teachers' ratings of the principals' instructional leadership were marginally higher than the principals' self-ratings on the dimensions of defining the school vision (principal, $M = 4.265$; teacher, $M = 4.312$; principal–teacher rating difference $= 0.047$; $p < 0.05$) and managing the instructional programme (principal, $M = 4.053$; teacher, $M = 4.105$; principal–teacher rating difference $= 0.052$; $p < 0.05$).

Table 5 Paired *t* test between principals and teachers' rating grouped by power distance

Variables	Mean		N	T	DF	SIG	Hypothesis supported or not
	Principals	Teachers					
High power distance rated by principal							*p < T*
D1: defining the school vision	4.201	4.258	973	−2.608	972	0.009**	Yes
D2: managing the instructional programme	3.965	4.079	973	−5.251	972	0.000***	Yes
D3: developing the school learning climate	3.981	4.011	973	−1.348	972	0.178	No
Overall: principal instructional leadership	4.026	4.089	973	−3.320	972	0.001**	Yes
Low power distance rated by principal							*p > T*
D1: defining the school vision	4.361	4.271	735	3.773	734	0.000***	Yes
D2: managing the instructional programme	4.218	4.102	735	4.919	734	0.000***	Yes
D3: developing the school learning climate	4.132	4.025	735	4.475	734	0.000***	Yes
Overall: principal instructional leadership	4.212	4.106	735	5.195	734	0.000***	Yes
High power distance rated by teacher							*p < T*
D1: defining the school vision	4.275	4.209	805	2.774	804	0.006**	No
D2: managing the instructional programme	4.098	4.071	805	1.125	804	0.261	No
D3: developing the school learning climate	4.054	3.997	805	2.735	804	0.006**	No
Overall: principal instructional leadership	4.118	4.064	805	2.570	804	0.010*	No
Low power distance rated by teacher							*p > T*
D1: defining the school vision	4.265	4.312	903	−2.131	902	0.033*	No
D2: managing the instructional programme	4.053	4.105	903	−2.399	902	0.017*	No
D3: developing the school learning climate	4.040	4.044	903	−.194	902	0.846	No
Overall: principal instructional leadership	4.095	4.124	903	−1.547	902	0.122	No

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

To sum up, our second hypothesis was largely supported when using the principals' ratings of PD. Specifically, principals who reported high PD gave significantly lower self-ratings than the teachers' ratings on the overall score of instructional leadership and on the dimensions of defining the school vision and managing the instructional programme. Principals who reported low PD gave significantly higher self-ratings than the teachers' ratings of instructional leadership on the overall score and all of its dimensions. Nonetheless, our second hypothesis was not supported when using the teachers' ratings of PD. Specifically, when the teachers reported high PD, the teachers' overall ratings of principal instructional leadership were lower than the principals' self-
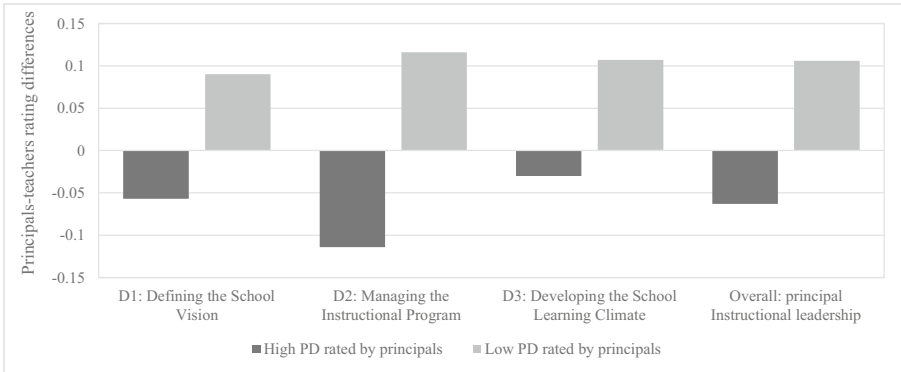
Fig. 1 Principal–teacher rating differences grouped by PD rated by principals

ratings, especially on the dimensions of defining the school vision and developing the school learning climate. When the teachers reported low PD, the principals' self-ratings were marginally lower than the teachers' ratings of principal instructional leadership on the dimensions of defining the school vision and managing the instructional programme.

4 Discussion

This study examined the differences between principals' and teachers' ratings of principals' instructional leadership in the Chinese educational context and tested whether PD helps to explain the variation in the pattern of principal–teacher rating differences. Our findings showed that Chinese principals and teachers provided very similar ratings of principals' instructional leadership. The results are inconsistent with most literature in this regard (e.g. San Nicolas 2003; Henderson 2007). Nonetheless, similar results were also found by Sinnema et al. (2015) with a particular group of overly modest principals in New Zealand, and by Jiang (2015) with a small sample in China. Despite a possibly more hierarchical school system in China, as a nation with a rich Confucian heritage, our argument is that Chinese principals tend to be modest
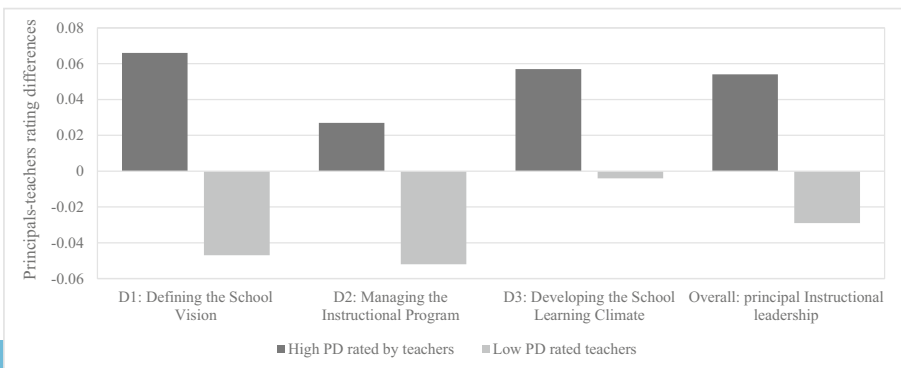

Fig. 2 Principal–teacher rating differences grouped by PD rated by teachers

when asked to self-assess their instructional leadership practices. In addition to the very close ratings of principals' instructional leadership, the results also indicated the principals and teachers agreed on the relative ranking of the three dimensions.

However, the close ratings between the principals and teachers do not mean that all principals and teachers perceptions of instructional leadership performed by the principals. The test of the second hypothesis revealed significant differences between the principals' and teachers' ratings of principal instructional leadership when we divided the principals into high and low PD groups. Specifically, when school principals reported high PD, their overall self-ratings and the dimensions of defining the school vision and managing the instructional programme were significantly lower than the teachers' ratings.

Chinese society has traditionally had high expectations for its leaders' moral conduct (Li and Shi 2005). Powerful authorities have been characterised as benevolent and having moral integrity (Farh and Cheng 2000). Principals who are aware of high PD in their interactions with teachers may internalise high moral and performance standards for themselves. Therefore, even if there is limited interaction between the principal and teachers, out of deference and respect to the principal, teachers may still give higher ratings on overall instructional leadership practices. The exception is the dimension of the school learning climate, which remains a challenging area for principals. In contrast, principals who perceive low PD in their interactions with teachers may use a more personal, rather than a structured approach to working with teachers. Because the principal of a school is greatly outnumbered by teachers, especially in schools in China, the principal is unlikely to adopt a personal approach to working with every teacher in the school. Their over-interaction with some teachers will inevitably give rise to in-group and out-group differences, which could further undermine the teachers' overall rating of the principal's instructional leadership.

In addition to the PD reported by the principals, the teachers' perceptions of PD were also used to test the perceptual gap between principals and teachers. Contrary to our hypothesis, when high PD was reported, the teachers tended to rate the principals significantly lower on overall instructional leadership and on the dimensions of defining the school vision and developing the school learning climate. However, when low PD was reported, the teachers rated the principals higher on the dimensions of defining the school vision and managing the instructional programme, but not on overall instructional leadership.

To a certain extent, the results also make sense from the teachers' perspective, because an aggregated high PD perceived by the teachers generally indicates less direct interaction with the principals (Antonakis and Atwater 2002). As noted in section 3, there was a very low correlation between the PD ratings of the teachers and the principals. Therefore, although the teachers in these schools reported high PD, their principals may not have admitted the high PD in their interactions with teachers. The teachers in these schools may have had fewer opportunities to observe the principals' leadership practices, and with a lack of deference and respect for these principals, the teachers rated them lower. However, a low PD perceived by the teachers should indicate broader direct interaction with principals. Teachers in these schools may have had more opportunities to observe the principals' leadership practices and thus tended to give higher leadership ratings (Tyler et al. 2000).

It is noteworthy that there was a low positive correlation between the PD reported by the principals and the PD reported by the teachers. Indeed, Sin et al. (2009) also

confirmed that a leader and a member do not see eye to eye and found a low level of agreement between leader and member judgements of the same leader–member relationship. The rationale is that the leader and member may rely on different interaction episodes and experiences as the basis for their judgement of the leader–member relationship. Therefore, it is possible that the principals and teachers relied on different cues as the basis of their judgement of PD. This finding again highlights the importance of collecting principal–teacher interaction and relationship information from both principals and teachers.

4.1 Theoretical implications

We found that in general, the Chinese principals' ratings of their own instructional leadership were very close to those given by the teachers, although most Western studies have reported that principals' self-ratings of instructional leadership are higher than those given by teachers. This finding implies that the rating differences between principals and teachers on principals' instructional leadership should not be hastily generalised to the Chinese educational context. Nevertheless, we wish to clarify that the generally close principal–teacher ratings do not mean that future studies on instructional leadership in China only need to collect information from one source, i.e. either the principals or the teachers. Nor does the small principal–teacher rating difference necessarily indicate more effective principals or better quality of communication and interaction between principals and teachers in China. Instead, our findings suggest that future researchers need to examine the actual relationship between the principal–teacher rating differences and principals' effectiveness and quality of principal–teacher communication, so that researchers can better interpret the practical implications of both positive and negative principal–rating differences in China. Furthermore, we found that PD, especially when reported by the principals, helped to explain the variation in the patterns of principal–teacher rating differences. Future studies may consider and test other contextual factors that give rise to the hidden variation in patterns of principal–teacher rating differences and should pay more attention to the source of information.

4.2 Practical implications

In section 1, we pointed out the recent release of the Professional Standards of Principals in Compulsory Education by MOE in 2013. What we want to highlight in these standards is that the central position of instructional leadership in affecting overall school development is gaining increasing recognition in the Chinese education system (Zhao and Song 2014; Zhang 2014). Therefore, the findings of this study contain obvious, timely implications for principal evaluation and principal development in China. First, our finding regarding the agreement between the principals and teachers on the highest dimension (defining the school vision) and the lowest dimension (developing the school learning climate) suggests that there should be greater emphasis on the development of the school learning climate in future leadership development programmes. Second, based on the results of most empirical studies conducted elsewhere, principals' self-ratings of instructional leadership are expected to be higher than those given by teachers, and small rating differences indicate more effective principals and better communication and interactions between principals and teachers (Goff et al.

2014; Park and Ham 2014; Sinnema et al. 2015). Our first finding concerning the generally close ratings between the principals and teachers suggests that a substantial portion, if not half, of Chinese principals tend to rate themselves lower than the teachers rate them. Therefore, the bar for indicating effective principals and good-quality principal–teacher communication and interaction needs to be adjusted, and a more realistic assumption should be that negative principal–teacher rating differences (principals' self-ratings are lower than teachers' ratings), not small principal–teacher rating differences, indicate more effective principals and better quality principal–teacher communication and interaction. Third, the perceptual disparities combined with other appropriate feedback are supposed to trigger principals' motivation to further improve their instructional practice (Goff et al. 2014; Smither et al. 2005; Sinnema et al. 2015). The close principal and teacher ratings of principals' instructional leadership suggests that merely using this measure, the evaluation administrators may not be able to find as many significant principal–teacher rating differences as their counterparts find elsewhere and, thus, may not be able to offer much useful improvement feedback to many of the principals. Nonetheless, our second group of findings on PD prescribe how to make use of the principal–teacher rating differences more appropriately. Specifically, our findings suggest that in China, feedback on principal–teacher rating differences is still relevant and particularly useful for those principals who perceive low PD in their interactions with teachers and those whose teachers perceive high PD. For principals who endorse high PD and may hold higher moral and performance standards for themselves, evaluation administrators need to refer to other indicators of principals' effectiveness and quality of principal–teacher interactions and interpret the results more carefully.

4.3 Limitations

The results of this study may be limited by the measurement and sample. The first possible limitation is the measurement issue. A recent study conducted by Antoniou and Lu (2017) tested the reliability and validity of the full 50-item PIMRS and concluded that deleting six items from the questionnaire would lead to a better fitting scale for measuring instructional leadership in the Chinese context. Qian et al. (2017) suggested that instructional leadership in China should include three new context-specific dimensions. We adopted the PIMRS in its original short form as we wanted our results to be comparable with those published in Western countries, and the short PIMRS scale indeed demonstrated satisfactory measurement quality in this study. Further Chinese studies may consider testing a similar set of hypotheses to those proposed in this study by incorporating the research advances on the measurement of instructional leadership in China. Another limitation is the use of a single city, which limits the generalisability of the findings to the entire country. The sample size (132 Chinese principals and 1708 teachers) seems large; however, future studies may need to recruit participants from different locations across China.

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