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The effects of principals' perceived instructional and distributed leadership practices on their perceptions of school climate

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ABSTRACT

The purpose of this study was to investigate the extent to which leadership styles predict school climate, in order to identify whether a relationship exists between principals' perceived practices of instructional and distributed leadership and their perceptions of school climate (mutual respect and school delinquency), controlling for a net of principal and school characteristics. This research was conducted on a principal data-set from the 2013 Teaching and Learning International Survey (TALIS), which was administered by the Organization for Economic Co-operation and Development (OECD). Several linear regression models with and without the country controlled dummy variables were conducted, respectively. Results indicated that principals' perceived distributed and instructional leadership practices are significant predictors of staff mutual respect in the school. Nevertheless, such leadership styles did not appear as important factors for school delinquency and violence. School size and socio-economic status turned out to be the two most important factors predicting school safety. These results add nuance to the findings of previous studies that principals' emphasis on instructional practice and sharing leadership can play a significant role in promoting the trust, collegiality and respect among staff. However, more than such leadership styles may be needed for creating a safe and orderly school environment.

Introduction

Principals are vital in schools because they 'play managerial, political, instructional, institutional, human resource and symbolic leadership roles' (Hallinger, 2003; p. 334), which indirectly impact learning through their direct effect on teachers, structures and processes in the school over time (Harris, 2009b; Heck & Hallinger, 1998; Leithwood & Seashore-Louis, 2012; OECD, 2001; Robinson, Lloyd, & Rowe, 2008). Due to the variation within the school contexts, available resources and principal characteristics, principals adopt different leadership styles in the school that have differentiated emphasis, purposes, and strategies to shape the school and influence students and staff (Nir & Hameiri, 2014; Printy, 2010). Empirical studies have testified to the significant role of the school principal's leadership styles in explaining the success of school processes and outcomes (Leithwood & Jantzi, 1990, 2000; Randeree & Chaudhry, 2012; Slegers, Nguni, & Denessen, 2006; Wong Humborstad & Perry, 2011).

Among the available studies, much of the evidence-based research directs attention to the influence of transformative and transactional leadership styles (Dumdum, Lowe, & Avolio,

2002; Slegers et al., 2006), providing consistent evidence in supporting the positive effects of transformational leadership on teachers' satisfaction (Slegers et al., 2006; Wahab, Fuad, Ismail, & Majid, 2014), self-efficacy, and organizational commitment (Berson & Avolio, 2004; Leithwood & Jantzi, 1990), as well as school organizational capacity (Leithwood & Jantzi, 1990), health (Korkmaz, 2007), climate and effectiveness (Berson & Avolio, 2004; Marks & Printy, 2003).

As to instructional leadership, researchers found relationship of it to several constructs, including organizational health (Recepoglu & Ozdemir, 2013), school culture (Sahin, 2011), teachers' self and collective efficacy (Calik, Sezgin, Kavgaci, & Kilinc, 2012), collaboration (Gumus, Bulut, & Bellibas, 2013), job satisfaction (Duyar, Gumus, & Bellibas, 2013) and attitude towards change (Kursunoglu and Tanriogen, 2009). The literature also provided evidence regarding the association of principals' instructional leadership and school climate. However, most of these studies focused on only some aspects of climate that are related to cooperation, teamwork and communication (Kozlowski & Doherty, 1989), and instruction, such as protecting instructional time, providing incentives for teaching and learning and making professional development available for teachers (Hallinger, Bickman, & Davis, 1996; O'Donnell & White, 2005), or examined the climate as a single construct (Mendel, Watson, & MacGregor, 2002).

In addition, distributed leadership has gained popularity since last decade due to its capacity to include broad stakeholders with expertise and skills into school management and operation (Bolden, 2011; Elmore, 2000; Harris, Leithwood, Day, Sammons, & Hopkins, 2007; Lashway, 2006; Leithwood et al., 2007; Spillane, 2005; Woods, Bennett, Harvey, & Wise, 2004), and research supports the participation from broad shareholders positively impact the staff satisfaction and commitment around the school goal (Angelle, 2010; Gumus, 2015; Hartley, 2010; Hulpia, Devos, Rosseel, & Vlerick, 2012; Hulpia, Devos, & Van Keer, 2009; Mascal, Leithwood, Straus, & Sacks, 2008), and cohesion among faculty (Heck & Hallinger, 2009; Price, 2012; Printy, 2008).

However, the literature is inadequate in twofold. First, not much of research examined the school climate in both establishing security and developing respect among staff, which are prerequisite for a safe environment in creating and sustaining professional collegiality, cooperation and teamwork. Second, the effects of both instructional leadership and distributed leadership styles, and their interactive influence on school climate still remains unclear. The limitation of the literature offers the opportunity for current empirical research investigating the effect of two important school leadership styles on comprehensive school climate. This research aims to fill the gap in the literature by examining the effects of principals' perceived instructional and distributed leadership practices on their perceptions of mutual respect among staff and school safety.

The 2013 Teaching and Learning International Survey (TALIS), administered by the Organization for Economic Co-operation and Development (OECD), is an international study emphasizing school working conditions, school management and school climate, along with other rich school-based information (OECD, 2014). Using TALIS 2013 data, the current study attempts to shed new light on the potential influence of two most fervent leadership styles on school climate. Specifically, this study proposes that school leaders' utilization of instructional and distributional leadership that enables those leaders to focus on school instructional effectiveness and people empowerment (Hallinger, 2005; Hallinger & Murphy, 1985; Halverson, Diamond, & Spillane, 2004; Hartley, 2007; Spillane & Diamond, 2007) should have direct impact on school climate, mainly in staff mutual respect and school delinquency. This study is significant because most previous leadership research exclusively testified to the significant and direct role of school leadership on school processes (Heck & Hallinger, 1998; Leithwood & Jantzi, 1990). However, this research focuses on investigating how two leadership styles, instructional leadership that mobilizes school capacity for instructional improvement, and distributed leadership that involves broad stakeholders in school decision-making and school functions, are directly related to two essential components of school climate: staff mutual respect and school safety that are found to be key mechanisms

for establishing an effective teaching and learning environment in the school (Bryk, Sebring, Allensworth, Luppescu, & Easton, 2010).

Theoretical foundations

In this section of the paper, we first provide theoretical foundations of the dependent variable (school climate) and independent variables (instructional leadership and distributed leadership), then move on to the discussion of the relationship between them.

School climate

Educational researchers have developed a growing interest in school climate, arguing that school climate reform is an evidence-based school improvement strategy that promotes safer and more supportive schools to benefit the people inside (Cohen, McCabe, Michelli, & Pickeral, 2009; Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013). Recently, school climate research has emphasized on the importance of 'the atmosphere, culture, resources, and social networks of a school' (Loukas & Murphy, 2007) that primarily possesses five essential dimensions: safety, relationships, teaching and learning, institutional environment, and the school improvement process (Thapa et al., 2013). These combined dimensions shape the school climate as it is perceived by people both inside and outside of the school, and ultimately influence the outcomes and the experiences of the individuals within the school system (Cohen et al., 2009; Collie, Shapka, & Perry, 2012; Freiberg, 1999; Loukas & Murphy, 2007; Thapa et al., 2013). Previous research has demonstrated that perceived school climate is a key predictor of individual attitude (De Nobile, McCormick, & Hoekman, 2013; Desai, Karahalios, Persuad, & Reker, 2014; Hoy & Woolfolk, 1993; Liu & Bellibas, *in press*; Rayner et al., 2005; Taylor & Tashakkori, 1995), and that school climate is also a prevailing determinant of student outcomes (Bryk et al., 2010). However, because the previous scholarship frequently treated school climate as an independent variable for its impact on school processes and outcomes, there is insufficient evidence regarding how school leaders' adoption of different leadership styles will shape the school climate, primarily surrounding relationships and safety.

Leadership styles

Leadership style can be understood as the perceived behaviour pattern that a leader exhibits when attempting to set direction and influence their subordinates (Glanz, 2002; Hersey & Blanchard, 1981). Two of the most fervent leadership styles that have been emphasized in recent research are instructional leadership and distributed leadership.

Instructional leadership

Research has shown that instructional leadership in particular plays a pivotal role in effective schools (Hallinger, 2005; Marks & Printy, 2003). It has been widely supported since the 1980s that principals in instructionally effective schools fulfil strong instructional leadership (Hallinger, 2005), which focuses on direct classroom supervision, working with teachers on the school's instructional programme, solving instructional problems collaboratively, helping teachers secure resources and providing staff development activities (Coldren & Spillane, 2007).

Hallinger (2005, p. 223) describes instructional leaders as 'strong, directive leaders who are successful at turning their schools around'. The effective instructional leader is able to align their strategies and activities with the school's academic mission. Thus, instructional leaders focus not only on leading, but also on creating a positive climate for learning, as well as managing instructional practices (Hallinger, 2005).

Several notable models of instructional leadership have been developed. Among them, the most influential model was proposed by Hallinger and Murphy (1985), who outlined three dimensions of the

instructional leadership roles: defining the school's mission, managing the instructional programme, and promoting a positive school learning climate. From Hallinger and Murphy's perspective, building a positive learning climate is a critical component for successful instructional leadership, and the behaviours of school principals are linked to the climate of their schools. School climate is impacted by the instructional leader's ability to motivate individuals and mobilize people to work towards the common good. The principal has the responsibility of developing a school climate that is conducive to providing the very best instructional practices (Hallinger, 2003; Hallinger & Murphy, 1985).

Distributed leadership

In a shifting school context fraught with the pressure of accountability, the tasks and challenges of leadership become increasingly complex and beyond the knowledge, skill and capacity of any single individual leader (Hargreaves & Fink, 2006; Leithwood & Seashore-Louis, 2012). The wave of changes resulting from standardizing, financial, curricular and technological reforms, as well as a growing demand for accountability, calls for personnel cooperation and leadership shared at multiple levels to maximize school success (Harris, 2009a). Distributed leadership is understood as decision-making and influential practices performed by personnel at multiple levels instead of one predominant leader at the top (Elmore, 2000; Harris, 2009a; Hartley, 2007; Lashway, 2006). This concept currently attracts a range of meanings and is associated with a series of practices, with varying implications for organizational processes, leadership effectiveness, individual attitudes and school improvement (Angelle, 2010; Chang, 2011; Heck & Hallinger, 2009; Hulpia et al., 2012; Leithwood, Mascall, & Strauss, 2009). In the work of Bolden (2011), a number of studies indicate a positive relationship between distributive leadership and organizational change, teacher leadership, professional learning communities, teachers' self-efficacy and school morale.

Gronn (2002) suggests that distributed leadership may be viewed from two broad perspectives: the numerical perspective argues that distributed leadership is understood as the 'aggregated leadership behavior of some, many or all of the members of an organization or an organizational sub-unit' (p. 655); the holistic perspective sees distributed leadership as 'an all-inclusive phenomenon that encompasses the practice of delegation, sharing, collaboration, dispersion and democratizing leadership in schools' (p. 656). Spillane, Halverson, and Diamond (2004) identify 'leader plus' and 'activity theory' as the conceptual foundations of their particular account of distributive leadership; they claim leadership distribution is the synergistic interaction of the leader, the subordinates, and the situation, involving people with expertise and skills in school leadership roles whenever it is necessary. These perspectives highlight that leadership distribution is a process involving the interaction of individuals across boundaries, where people with expertise and skills work together to fulfil leadership roles in the school, which promotes the school's academic capacity (Heck & Hallinger, 2009; Marks & Printy, 2003) and staff's job optimism and organizational commitment (Chang, 2011; Hulpia et al., 2009, 2012; Mascall et al., 2008). With the evidence for the positive impact of distributed leadership on school process, there still lacks evidence on how the involvement of broad stakeholders in decision-making might help create a collaborative and safe school climate.

Principal leadership and school climate

The literature concurrently suggested the lack of evidence concerning principals' direct influence on pupils' learning, yet it is found that they indirectly impact learning through their direct effect on teachers, structures and processes (Harris, 2009b; Heck & Hallinger, 1998; Leithwood & Seashore-Louis, 2012; OECD, 2001; Robinson et al., 2008). Consistent research testified to the significant and direct role of school leadership on school processes (Heck & Hallinger, 1998; Leithwood & Jantzi, 1990). The school processes include multifaceted components related to the teachers' teaching practices (Cohen et al., 2009; Robinson et al., 2008), curriculum quality (Porter, 1991), school daily life (Cohen et al., 2009; Opdenakker & Damme, 2001) and school culture (Heck & Hallinger, 1998), through which principals influence learning indirectly. Opdenakker

and Damme (2001) identified several components of school process in relation to schools daily life, including 'teaching staff cooperation, discipline and subject matter acquisition, attention to student differences and development' and 'orderly learning environment'. Most of these process indicators, such as orderly environment, culture, staff cooperation and discipline, also refer to 'school climate' (Loukas & Murphy, 2007; Thapa et al., 2013).

Researchers often considered school leadership an important determinant of the climate factor in the school (Kozlowski & Doherty, 1989). Studies showed that the type of leadership that principals adopt is important for the variance in the school climate. Among these studies, Mendel et al. (2002) for instance found that collaborative leadership style has much more positive effects on climate than directive leadership does, suggesting that distributed leadership is more effective than traditional instructional leadership in establishing a positive school climate. Many researchers related principals' leadership to 'school climate, e.g. effective communication, teacher advocacy, participatory decision-making, and equitable evaluation procedures' (Kelley, Thornton, & Daugherty, 2005). However, not much research has focused on the association between leadership styles and school climate in school safety and respect among staff. Working on more than a hundred schools in Chicago, Bryk et al. (2010) suggested that school safety should be the main component of climate for principals to focus on, particularly in schools filled with low socio-economic status students. Students' sense of safety regarding both inside and outside the school is fundamental for their learning. It is also emphasized that principals should improve professional collaboration among teachers, which can be achieved through respect among staff (Bryk et al., 2010).

Conceptual framework

The conceptual framework of this study (See Figure 1) is based on the organizational theory that considers the input as the key to predict the quality of the process that eventually influences the outcome of the organization (Porter, 1991). We propose a model for our study, in which we focus primarily on two fervent leadership styles that have been supported by the research to have positive impact on school climate and student achievement (Heck & Hallinger, 2009; Marks & Printy, 2003). While our interest is to address the lack of solid comparative research in an international context to investigate how the principal's perceived instructional leadership and distributed leadership would impact two

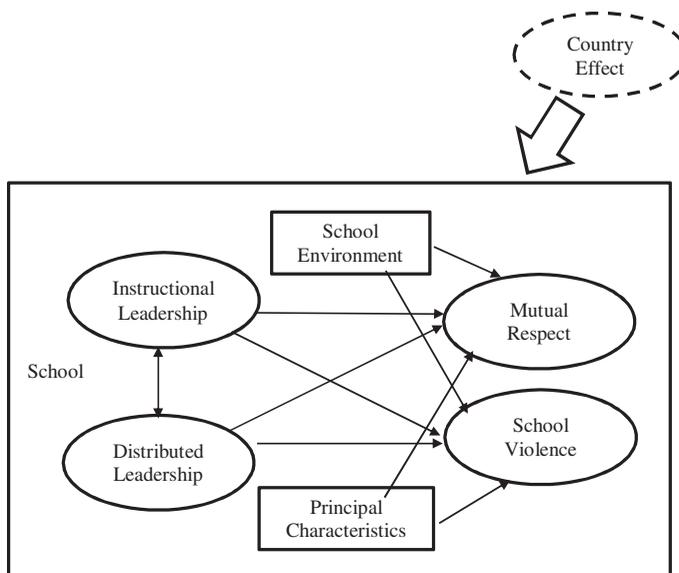


Figure 1. Principal Leadership Styles as the Predictors of School Climate Indices

Note: The arrows do not show causal relationship between variables; rather, they indicate the direction of associations.

of the most important components of school climate as school violence, and staff mutual respect with a large-scale data-set. The model takes into consideration of the complexity in the school setting, in which school context, such as the location, student composition, size and principal backgrounds including gender, age, education, experience and employment status could play vital role influencing how they perceive the leadership practice, and how the leadership practice could predict the school climate mainly in mutual respect and violence. Adopting rigorous quantitative method, we intend to detect the correlation between principal perceived leadership styles and school climate, controlling for various school and principal backgrounds. In addition, we realize the potential impact the country-level variance could have on school mutual respect and violence, we therefore include country dummy variable in our model to compare the country effect as well.

Data and methods

This section of the paper begins with detailed information regarding a secondary data-set employed in the study. It, then, discusses the dependent and independent variables. Finally, it lays out the strategy for the analysis of the data.

Data source

The data for this research comes from Teaching and Learning International Survey (TALIS) conducted by Organization for Economic Cooperation and Development (OECD) in 2013. The TALIS reveals significant amount of information regarding the characteristics of schools and education systems in 34 countries. Through conducting the TALIS, OECD aims to provide policy-makers, researchers and practitioners with the extensive data describing the learning environment and working conditions of teachers and school principals. The TALIS data also includes rich information regarding various key issues facing teachers and principals, such as appraisal, feedback, job satisfaction, self-efficacy, professional development, leadership, autonomy, and more.

The TALIS mainly collected data from lower secondary schools. The data typically involves 200 schools from each country and 20 teachers from each school. The TALIS used two questionnaires to collect data: the first was a principal questionnaire, and the second was a teacher questionnaire. Due to the purpose of this research, only the TALIS' principal data-set was analysed.

OECD adopted two-stage stratified sampling method that first randomly selected 200 schools in the participating countries from the complete list of the ISCED level of interest, then randomly selected 20 teachers in the selected schools. The international core population consisted schools providing ISCED Level 2 education as defined by the International Standard Classification of Education 1997. The TALIS 2013 sampling coverage extended to all teachers and the principals of an ISCED level in the ordinary schools with a 5% threshold as an upper limit for the exclusion of schools of special education from the survey. To ensure the quality of the survey data, the minimum school participation rate in TALIS and teacher participate rate within a schools was set as 75% after replacement. Although replacement school could be included in the data, the National Project Managers were encouraged to obtain the originally selected schools in the participation, which would reduce the 'purposive' effect in the sampling and secure the reliability, validity and interpretability of a country's results (OECD, 2014).

The total schools sampled in this study were more than 6000. As a sample-based study, the TALIS 2013 had to be theoretically sound, and to seek reliability of the survey instrument. The process involved identifying and documenting the conceptual knowledge and theoretical underpinnings of key themes, research questions and desired indicators. From OECD's technical report (2014), the primary aims of the instrument development process were to create instruments that aligned well with the conceptual framework, were of high psychometric and technical quality, and able to generate data, measures and scales that could address TALIS's key themes and interests. In addition, the second round of TALIS team also evaluated and revised work done based on the first round of the TALIS in 2008.

Variables

Dependent variables

In this study, school climate mainly refers to school delinquency and violence, and staff mutual respect perceived by the school principal. In the TALIS questionnaire, there are four items designed to probe the principal's perspective about the school violence. These items are 'vandalism and theft; intimidation or verbal abuse among students (or other forms of non-physical bullying); physical injury caused by violence among students; and intimidation or verbal abuse of teachers or staff'. All items in the school delinquency and violence scale were answered on a five-point scale. Response categories were 1 for 'never', 2 for 'rarely', 3 for 'monthly', 4 for 'weekly' and 5 for 'daily'.

The second school climate scale is staff mutual respect, and it consists of four items, including 'school staffs have an open discussion about difficulties; there is mutual respect for colleagues' ideas; there is a culture of sharing success; and the relationships between teachers and students are good'. Items in the mutual respect scale were answered by the principal on a four-point scale. The response categories were 1 for 'strongly disagree', 2 for 'disagree', 3 for 'agree' and 4 for 'strongly agree'.

Independent variables

The main independent variable in this research is school principals' perceived leadership practices. TALIS 2013 assessed principals' leadership on two contemporary leadership concepts: instructional leadership and distributed leadership. A scale was created for each concept. The instructional leadership scale involves three items, and these are: 'I took actions to support co-operation among teachers to develop new teaching practices', 'I took actions to ensure that teachers take responsibility for improving their teaching skills' and 'I took actions to ensure that teachers feel responsible for their students' learning outcomes'. Principals were asked to indicate how often they perform each activity on a four-point scale, with the response categories 1 for 'never or rarely', 2 for 'sometimes', 3 for 'often' and 4 for 'very often'.

The distributed leadership scale is also composed of three items, including 'this school provides staff with opportunities to actively participate in school decisions', 'this school provides parents or guardians with opportunities to actively participate in school decisions' and 'this school provides students with opportunities to actively participate in school decisions'. Principals were asked to indicate how strongly they agree or disagree with each statement on a four-point scale, where the response categories were 1 for 'strongly disagree', 2 for 'disagree', 3 for 'agree' and 4 for 'strongly agree'.

Construct method for the variables and reliability test

The construct of the dependent variables of school violence and staff mutual respect adopted latent trait method that generates continuous variable using categorical manifests. The observed variables used to construct latent variables in this study are all ordinary responses as indicated above. TALIS adopted complex two-stage cluster method for sampling (OECD, 2014), therefore, in order to properly handle complex survey data with categorical responses. Latent trait method was used to construct the latent variables of the interest for this study with weight adjusted properly. Weight was calculated by OECD to adjust the unequal probability of selection during the sampling stage and response rate for each country.

Cronbach's alpha test is a function of the average inter-correlation among the items used for a latent construct. The alpha larger than or close to .7 is a good sign of internal consistency of the construct (Creswell, 2014). In terms of internal consistency of the manifest in each latent variable, OECD (2014) indicated that the alpha reliability coefficient in both of the school climate scales for most of the 34 participating countries was above .70, with few exceptions. Only Norway had a lower scale reliability value for the school delinquency and violence scale ($\alpha = .547$), and only the Czech Republic ($\alpha = .679$), Estonia ($\alpha = .673$), the Slovak Republic ($\alpha = .671$), Norway ($\alpha = .596$) and Israel ($\alpha = .554$) had slightly lower reliability values for the index of mutual respect. Overall, the reliability from the international

pooled samples was above .70 in all populations for school delinquency ($\alpha = .781$) and school mutual respect ($\alpha = .786$) (OECD, 2014).

The alpha reliability coefficient was above .70 for most of the participating countries; with several countries showed a reliability value below in the items of the distributed leadership scale. Overall, the international reliability was above .70 for the ISCED Levels 2. This standard was also applied to instructional leadership that the international reliability was above .70 for a pooled international sample.

Controlled variables

Along with the main independent variables (distributed and instructional leadership), several other principal and school characteristics are included in the analyses, in order to control for school context. Principal-related independent variables are used including gender, age, educational level, experience as a principal and employment status (full time without teaching obligation, full time with teaching obligation, part time without teaching obligation and part time with teaching obligation). School-related variables include school type (public or private), school location (rural, village, small town, town, city or large city), funding recourse (50% or more of the school's funding comes from the government), size (the number of students enrolled) and socio-economic status (See Table 1).

Multicollinearity test

The researchers also checked the correlation among the involved variables, and there is no multicollinearity issue because there is no correlation between any of the two variables is larger than .8 (Gall, Gall, & Borg, 2003), and none of the VIP is larger than 10 (Gall, Gall, & Borg, 2003) which is the rule of the thumb to test multicollinearity for the variables in a cluster.

Data analysis

The analysis started with the descriptive statistics of all the variables listed above. Then the researcher specified a set of linear models with the standard ordinary least square (OLS) assumptions. The regression models pooled all of the school observations across countries to reveal the pattern between the two leadership styles and school climate. The outcome variable, school climate, is classified as school mutual respect and school violence, therefore there were two sets of equations with the same independent and controlled variables but different dependent variables at a time. The primary interest of this study is the relationship between two leadership styles, distributed leadership (PDISLEADS) and instructional leadership (PINSLEADS), and two school climate indices, mutual respect (PSCMUTRS) and school delinquency (PSCDELIQS).

The regression analysis started with fitting unconditional models, and then added controlled variables and independent variables step by step in order to detect how much variance is explained by each leadership style and interactive effect of two leadership styles. For each equation, we also added country dummy variable to investigate the effect of individual country. This study used linear regression rather than multi-level regression for two reasons, one is that the TALIS study did not provide any variables at country level so the country level effect might only be measured by using fixed effect. Secondly, the interest of the study is to investigate the principal perceived leadership styles and the school climate, which are all at the school level. By adding the country dummy variables, we could detect clearly of whether and how much the country effect exert on school climate. This approach has been repeatedly used by researchers who focus on the international comparative study of education (Ammermueller & Pischke, 2009; Chudgar, Luschei, & Zhou, 2013; Hanushek & Woessmann, 2010; Zhou, 2014).

Two models were fitted for each dependent variable of interest for each equation, respectively. The first model was fitted without the country fixed dummy variable, and the second model was fitted with country effect. The rationale for using a country dummy variable is that institutional climate and school leadership styles are most likely endogenous to each individual country. That is, school climate is correlated with particular cultural, social and political contexts that are unique for each country,

which would partially account for the variations within school climate, but these distinctions at the country level are not explicitly available to researchers. Therefore, the use of country fixed effects or a dummy variable can account for the variations in dependent variables that are related to the countries' unobserved factors. By comparing the estimates from models both with and without fixed effects, researchers can measure the extent to which the national context affects a school's climate in terms of mutual respect and delinquency.

The analysis started with fitting unconditional models with and without country-level dummy variables, which would provide baseline statistics for the evaluation of the usefulness by adding the indicators and controlled variables in the models.

$$\text{PSCMUTRS}_{ij} = \beta_{ij} + \varepsilon_{ij}$$

$$\text{PSCMUTRS}_{ij} = \beta_{ij} + C_j + \varepsilon_{ij} \quad (1)$$

Then we added only controlled variables in the equations for Equation 3

$$\text{PSCMUTRS}_{ij} = \beta_{ij} + \gamma(\text{School})_{ij} + \delta(\text{Principal})_{ij} + \varepsilon_{ij}$$

$$\text{PSCMUTRS}_{ij} = \beta_{ij} + \gamma(\text{School})_{ij} + \delta(\text{Principal})_{ij} + C_j + \varepsilon_{ij} \quad (3)$$

The next step was to add independent variable by the order, the first predictor added is distributed leadership style in Equation 5.

$$\text{PSCMUTRS}_{ij} = \beta_{ij} + \alpha\text{PDISLEADS}_{ij} + \gamma(\text{School})_{ij} + \delta(\text{Principal})_{ij} + \varepsilon_{ij}$$

$$\text{PSCMUTRS}_{ij} = \beta_{ij} + \alpha\text{PDISLEADS}_{ij} + \gamma(\text{School})_{ij} + \delta(\text{Principal})_{ij} + C_j + \varepsilon_{ij} \quad (5)$$

Then we added instructional leadership in Equation 7 for its effect on staff mutual respect

$$\text{PSCMUTRS}_{ij} = \beta_{ij} + \alpha\text{PINSLEADS}_{ij} + \gamma(\text{School})_{ij} + \delta(\text{Principal})_{ij} + \varepsilon_{ij}$$

$$\text{PSCMUTRS}_{ij} = \beta_{ij} + \alpha\text{PINSLEADS}_{ij} + \gamma(\text{School})_{ij} + \delta(\text{Principal})_{ij} + C_j + \varepsilon_{ij} \quad (7)$$

This strategy was repeated for Equation 9 that is full specifications by adding two independent variables in one model.

$$\text{PSCMUTRS}_{ij} = \beta_{ij} + \alpha_1\text{PDISLEADS}_{ij} + \alpha_2\text{PINSLEADS}_{ij} + \gamma(\text{School})_{ij} + \delta(\text{Principal})_{ij} + \varepsilon_{ij}$$

$$\text{PSCMUTRS}_{ij} = \beta_{ij} + \alpha_1\text{PDISLEADS}_{ij} + \alpha_2\text{PINSLEADS}_{ij} + \gamma(\text{School})_{ij} + \delta(\text{Principal})_{ij} + C_j + \varepsilon_{ij} \quad (9)$$

For the dependent variable of school delinquency and violence, the same modelling strategy was applied as above models for mutual respect. So there are a set of Equations 2, 4, 6, 8, 10 as identified for school delinquency and violence.

Equations 1 and 2 are the unconditional models that provide baseline statistics for the evaluation of the conditional models. Equations 3–10 quantified the coefficient with the assumption that there is a linear correlation between school climate and leadership styles with an emphasis to detect how much variance is explained by each leadership style for school climate. As mentioned above, OECD adopted two-stage stratified sampling method for the TALIS 2013 study, therefore, the sample weight is essential to be included, in order to compensate for the unequal probability of being selected for each school and teacher, as well as different response rates. For this reason, OECD calculated final sample weights that are the product of the design and the adjustment factors: the former is the inverse of the selection probability, while the latter compensates for non-response and other random occurrences that induce estimate biases. All the regress in this study used proper sample weights for unbiased estimates for the whole population.

Findings

In this section of the paper, the results of analyses are provided. The section, first, presents findings of the analyses focusing on the effects of leadership styles on mutual respect. It, then, presents findings for leadership styles predicting school delinquency and violence.

Mutual respect

Table 2 shows results for Equations 1, 3, 5, 7 and 9, all of which aim to reveal how two leadership styles predict mutual respect—the first component of school climate—with several school and principal characteristics controlled.

Specifically, the data analysis started with an unconditional model with and without country effect dummy variable. This provided a baseline to interpret the change in variance. Equation 1 in the Table 2 shows the result of the unconditional model for mutual respect, country effect dummy variable alone accounts for about 6% of the total variation in mutual respect index. Equation 3 included the controlled variables that explained extra 2% of the variance for staff mutual respect. Equation 5 included distributed leadership in the model with and without country effect controlled, respectively. Without the country effect controlled, the result indicated a significant and positive relationship between distributed leadership and staff mutual respect, controlling for all school and principal characteristics ($\beta = .215, p < .001$). Predictor distributed leadership explained another appropriate 5% of total variation in mutual respect. When the country effect was controlled together with all school and principal characteristics, the results again indicated a significant and positive relationship between distributed leadership and mutual respect ($\beta = .235, p < .001$). None of the school or principal characteristics significantly predicted mutual respect, except for gender. There was a significant difference between female and male principals, favouring female principals ($\beta = -.329, p < .05$). All variables, including the country level effect, explained about 13% of the total variation in the mutual respect index ($R^2 = .125$), while distributed leadership as a predictor accounted for 5% of the variation in mutual respect. Comparing to the model without country effect, the country effect dummy explained about 6% of total variation in mutual respect index.

Equation 7 involves two models to examine the relationship between instructional leadership and mutual respect, with and without country effect controlled. Without the country effect controlled, the result indicated a positive relationship between instructional leadership and staff mutual respect, controlling for all school and principal characteristics ($\beta = .242, p < .001$). Instructional leadership explained about 4% of total variation in mutual respect. When the country effect was also controlled, the results again indicated a positive relationship between instructional leadership and mutual respect ($\beta = .224, p < .001$). None of the school or principal characteristics, except for gender ($\beta = -.290, p < .05$), significantly predicted the mutual respect index, implying that female principals possessed more positive attitude regarding the stance of mutual respect in their schools. All variables, including the country level effect, explained about 12% of the total variation in the mutual respect index ($R^2 = .117$). This means that the country effect variable itself accounts for about 6% of total variation, which has been consistent across the equations.

Equation 9 included a set of two models for the relationship between distributed leadership, instructional leadership and mutual respect, with and without country effect controlled. Without the country effect controlled, there was a positive relationship between distributed leadership and school climate ($\beta = .179, p < .001$), and between instructional leadership and mutual respect ($\beta = .202, p < .001$), controlling for all school and principal characteristics. When the country effect was controlled together with all school and principal characteristics, the results again indicated a positive relationship between distributed leadership and mutual respect ($\beta = .204, p < .001$), as well as between instructional leadership and mutual respect ($\beta = .187, p < .001$). In both models, none of the school or principal characteristics significantly predicted mutual respect. All variables—including both leadership types, principal and school characteristics, and country level effect—explained 15% of the total variation

Table 2. Variables Predicting School Staff Mutual Respect.

	Equation 1	Equation 3	Equation 5	Equation 7	Equation 9					
	With Dummy	With Dummy	With Dummy	With Dummy	With Dummy					
Intercept	13.418*** (.067)	14.442*** (.230)	12.972*** (.870)	14.262*** (1.066)	9.944*** (1.008)	11.533*** (1.164)	10.397*** (.963)	11.396*** (1.219)	8.318*** (1.060)	9.511*** (1.278)
Independent variables										
PDIS-LEADS				.215*** (.032)	.235*** (.034)				.179*** (.032)	.204*** (.033)
PIN-SLEADS						.242*** (.035)	.224*** (.038)	.202*** (.035)	.187*** (.037)	
Controlled variables-principal characteristics										
Gender		-.352* (.142)	-.349* (.148)	-.246 (.138)	-.329* (.146)	-.236 (.143)	-.290* (.147)	-.165 (.139)	-.281 (.144)	
Age		.007 (.010)	.013 (.012)	.012 (.010)	.010 (.011)	.011 (.009)	.011 (.011)	.014 (.009)	.009 (.011)	
Education		.109 (.233)	.222 (.252)	.133 (.238)	.126 (.254)	.104 (.240)	.260 (.254)	.123 (.232)	.167 (.244)	
Experience		.012 (.009)	.019 (.010)	.004 (.009)	.017 (.010)	.002 (.009)	.015 (.010)	-.002 (.009)	.014 (.010)	
Employment status		.056 (.086)	-.131 (.086)	-.020 (.084)	-.106 (.090)	.069 (.082)	-.088 (.081)	.003 (.081)	-.074 (.087)	
Controlled variables-school factors										
Location		.047 (.056)	.029 (.058)	.053 (.054)	.027 (.056)	.032 (.054)	.004 (.057)	.040 (.053)	.007 (.056)	
Public or private		.034 (.169)	.012 (.188)	.203 (.156)	.214 (.185)	.087 (.160)	.064 (.180)	.219 (.150)	.231 (.179)	
Public funding		-.121 (.154)	-.241 (.169)	-.149 (.146)	-.223 (.166)	-.208 (.151)	-.209 (.166)	-.219 (.144)	-.200 (.164)	
Size		-.000 (.000)	-.000 (.000)	-.000 (.000)	-.000 (.000)	-.000 (.000)	-.000* (.000)	-.000 (.000)	-.000 (.000)	
SES		.033 (.055)	-.021 (.052)	.009 (.054)	-.049 (.052)	-.074 (.055)	-.072 (.052)	-.077 (.054)	-.089 (.051)	
N	6060	6060	5448	5448	5435	5435	5433	5433	5427	5427
R ²	.000	.054	.012	.080	.060	.125	.061	.117	.093	.150
Adj. R ²	.000	.049	.010	.073	.058	.118	.059	.110	.091	.143
F	.000	18.302***	1.148***	13.719***	5.681***	15.428***	5.799***	14.785***	8.115***	15.949***

Note: Standard errors in parentheses.

* $p < .05$, ** $p < .01$, *** $p < .001$.

in the mutual respect index ($R^2 = .15$). The difference between R² due to country effect dummy is 6%. Also, the result indicates that only distributed leadership accounts for 3% and only instructional leadership accounts for 2.5% of total variation in the mutual respect index.

School delinquency

Table 3 shows results for Equations 2, 4, 6, 8 and 10, all of which aimed to reveal how leadership predicts school delinquency—the second component of school climate—with several school and principal characteristics controlled.

Equation 2 in Table 3 has the result of the unconditional model for school delinquency and violence, country effect dummy variable alone accounted for about 14% of the total variation in the

Table 3. Variables Predicting School Delinquency and Violence.

	Equation 2		Equation 4		Equation 6		Equation 8		Equation 10	
	With Dummy		With Dummy		With Dummy		With Dummy		With Dummy	
Intercept	6.846*** (.077)	5.688*** (.141)	6.052*** (1.071)	4.012*** (1.018)	5.485*** (1.176)	5.229*** (1.207)	6.209*** (1.055)	4.428*** (1.169)	5.686*** (1.169)	5.494*** (1.325)
Independent variables										
PDISLEADS					.041 (.033)	-.052 (.032)			.046 (.033)	-.048 (.031)
PINSLEADS							-.014 (.040)	-.034 (.045)	-.024 (.040)	-.025 (.044)
Controlled variables-principal characteristics										
Gender		-.218 (.140)	-.041 (.152)	-.197 (.145)	-.043 (.153)	-.223 (.148)	-.047 (.157)	-.206 (.152)	-.049 (.157)	
Age		-.033* (.013)	-.007 (.014)	-.032* (.014)	-.006 (.014)	-.033* (.013)	-.006 (.014)	-.033* (.013)	-.006 (.014)	
Education		.256 (.227)	.304 (.242)	.260 (.231)	.323 (.237)	.257 (.230)	.297 (.249)	.262 (.235)	.319 (.243)	
Experience		.005 (.013)	-.013 (.012)	.004 (.013)	-.012 (.012)	.006 (.012)	-.012 (.012)	.005 (.012)	-.012 (.012)	
Employment status		.001 (.124)	.176 (.153)	-.020 (.126)	.163 (.154)	-.007 (.123)	.160 (.149)	-.024 (.124)	.157 (.151)	
Controlled variables-school factors										
Location		.021 (.061)	.054 (.061)	.022 (.061)	.054 (.061)	.020 (.060)	.057 (.060)	.022 (.061)	.056 (.060)	
Public or private		-.159 (.323)	-.519 (.401)	-.129 (.317)	-.569 (.389)	-.159 (.320)	-.529 (.396)	-.131 (.316)	-.571 (.387)	
Public Funding		-.331 (.227)	-.543 (.280)	-.334 (.228)	-.545 (.279)	-.324 (.226)	-.543 (.281)	-.325 (.228)	-.544 (.280)	
Size		.001*** (.000)	.001*** (.000)	.001*** (.000)	.001*** (.000)	.001*** (.000)	.001*** (.000)	.001*** (.000)	.001*** (.000)	
SES		.612*** (.080)	.506*** (.069)	.604*** (.083)	.507*** (.070)	.615*** (.089)	.509*** (.072)	.613*** (.089)	.512*** (.073)	
N	6052	6052	5447	5447	5435	5435	5432	5432	5427	5427
R ²	.000	.142	.199	.314	.200	.315	.199	.314	.201	.315
Adj. R ²	.000	.138	.198	.308	.199	.310	.197	.308	.199	.310
F	.000	44.655***	33.808***	39.485***	31.884***	38.699***	30.906***	38.613***	29.867***	37.820***

Note: Standard errors in parentheses.

* $p < .05$, ** $p < .01$, *** $p < .001$.

school delinquency and violence index. Equation 4 included two models for the relationship between distributed leadership and the school delinquency index, with and without country effect controlled. Without the country effect controlled, the result indicated no significant relationship between distributed leadership and school violence. Similarly, when the country effect was controlled together with all school and principal characteristics, the results again indicated no significant relationship between distributed leadership and school violence. However, significant and positive relationships between overall socio-economic status (SES) ($\beta = .604$, $p < .001$) and size ($\beta = .00102$, $p < .001$) of school and school delinquency were found, without country effect taking into account. The results remained the same when country effect was considered, that is, a significant and positive relationship between the school SES ($\beta = .507$, $p < .001$) and size ($\beta = .000916$, $p < .001$), and school delinquency index were evident. All variables including the country level effect explained about 32% of the total variation in the school delinquency index ($R^2 = .315$). About 12% of the variation is due to the country effect variable, but distributed leadership did not contribute much to the variation.

Equation 8 included two models for the relationship between instructional leadership and the school delinquency index, with and without country effect controlled. For both models, the result indicated no significant relationship between instructional leadership and school climate, controlling for all school and principal characteristics. Yet again, a significant and positive relationship between the school socio-economic status and size of school and school delinquency were found, both with and without country effect taken into account. All of these variables explained about 31% of total variation in the school delinquency index ($R^2 = .314$).

The results were similar in Equation 10, which included both leadership types together in two models with and without country effect dummy variable. Similar to Equations 6 and 8, only SES ($\beta = .512, p < .001$) and school size ($\beta = .00092, p < .001$) turned out to significantly predict the school delinquency index. The total variation explained by all variables was 32% ($R^2 = .315$). In this equation, the country effect dummy variable accounts for about 13% of total variation (a little smaller than in the unconditional model). However, R^2 for Equation 8 remained almost the same with Equation 5 and 6 since none of leadership style significantly predicted the school delinquency and violence index.

Interpretation and conclusion

The purpose of this research was to add nuance to previous studies on how instructional leadership and distributed leadership are associated with school climate, with regard to mutual respect and school safety, both respectively and jointly. Specifically, the TALIS 2013 multi-country data-set was used to investigate the relationship between two leadership types (instructional and distributed leadership) and school climate, controlling for a net of several principal and school characteristics.

The results of the current study provided evidence that principals' implementation of both distributed and instructional leadership is important for building a positive school environment with mutual respect and trust, which has been confirmed as the most important school component for school effectiveness and success (Bryk & Schneider, 2002; Hoy, Smith, & Sweetland, 2002). Consistent with these findings, previous studies supported that principals possess an essential position in the school in terms of establishing a positive school climate (Bellibas, 2015; Hoy et al., 2002; Hughes & Pickeral, 2013; Randeree & Chaudhry, 2012). In addition, analysis provided consistent findings when the country effect, which cannot be directly measured, was included in the model as a dummy variable. This implies that both leadership types are significant predictors of mutual respect, even when the variation in school climate that occurs due to the contextual (cultural, geographical, educational, etc.) background of each country was taken into account.

These results suggest that the variation in mutual respect among staff in the school can largely be explained through the extent to which principals apply instructional and distributed leadership to improve instructional effectiveness and empowering staff. It was found that when principals take action to facilitate co-operation between teachers towards best practices, ensure that teachers take responsibility for improving their teaching practice, and hold teachers accountable for student learning, a school positive climate that is based on staff respect is more likely to occur. In addition, when principals provide staff, parents and students with the opportunity to take part in the decision-making processes in the school, respect more likely to develop among the school staff. Such findings of the present study concur with the literature suggesting that collective focus on instruction increases the likelihood of interaction among the staff in a school (Gumus et al., 2013; May & Supovitz, 2011; Robinson et al., 2008) and effective instructional and distributed leadership practices are more likely to develop a school climate that allows for higher levels of collegial work (Heck & Hallinger, 2009; Hughes & Pickeral, 2013; Leithwood & Seashore-Louis, 2012; Marks & Printy, 2003).

Based on the findings, it is possible to state that principal leaders' influence on school process as measured by their perceptions of mutual respect among staff is not interrupted by any other contextual factors. In such case, leadership appeared as the most important factor to establish respect in school, because none of the principal characteristics or school characteristics was found to be a significant predictor of respect among staff. This finding indicates that regardless of school characteristics such

as location, size and socio-economic status, and principal characteristics, such as gender, educational level, experience and employment status, principals fundamentally play essential role in the school establishing a positive school climate with staff respect by ensuring teachers' collegial work, responsibility and accountability towards best instructional practice and student learning, and getting staff, parents and students involved in decision-making processes.

The results, however, did not reach the same conclusion for the school delinquency and violence index. It was found that leadership types were not associated with school delinquency, regardless of whether controlling for the country effect. Consistently, other research concluded that there was no statistically significant relationship between leadership styles and school violence (Henderson, 2013). Instead, two demographic variables, school size and SES, turned out to be the most important factors that are significantly related to school safety. This suggests that schools with fewer students are less likely to suffer from disciplinary issues, including vandalism and theft, intimidation or verbal abuse among students, physical injury caused by violence among students, and intimidation or verbal abuse against teachers or staff. Previous research concurs with this finding as well, favouring smaller schools, which concluded that school size had a direct influence on student attitude and climate (Bates, 1993; Fowler & Walberg, 1991; Howley, 1995). More specifically, Ferrist and West (2004) stated 'the largest sized schools are five times more likely to report serious violence than their mid-sized alternatives' (p.13).

A second important factor to determine the level of school delinquency and violence is the socio-economic status (SES) of the students in the school. According to findings, principals' instructional and distributed leadership practices have no relationship with the school violence and delinquency index; it is rather the socio-economic status of students that predicts the extent to which violence occurs in the school. Previous studies are consistent with this finding (Heimer, 1997), which indicated that violence is more likely to occur in low-income communities and it has an impact on educational processes (Jones & Smith, 2011). Given this reality, it is evident that the issue of violence is more likely related to the school community characteristics and hence principals' personal effort to implement instructional and distributed leadership within the boundary of the school alone may not be sufficient to reduce violence.

In conclusion, the result of the current study has added nuance to the findings of previous studies that instructional and distributed leadership practices can play a significant role in promoting school climate, in terms of the development of interpersonal relationships, respect and trust among staff. Bryk et al. (2010) pointed out that establishing respect among staff is an indispensable component of school improvement efforts but did not mention how might leadership contribute to the establishment of such climate. This study took their study one step further through the conclusion that by exercising effective instructional and distributed leadership practices, principals can establish mutual respect and trust among staff. Principals can achieve this by involving staff in decision-making processes and holding them accountable and responsible for collegial work, instructional improvement and student learning are key practices.

Given this study applied large-scale international data-set that includes 32 countries (public data among 34 countries in the 2013 TALIS) with more than 6000 schools, along with rigorous statistical analytical approach, the result has been credible to be generated to a wide range of circumstances to provide empirical evidence for the policy-makers and practitioners to strategically promote principals' awareness and perception towards implementing leadership practices that focus on staff collegial work, holding the staff accountable for instructional practice and outcomes, and involving broad stakeholders in school decision-making.

Limitations of the study

One issue raised at this point is that such leadership styles do not play a significant role in creating a safe and orderly environment that is free from violence. School violence is found to be associated with school size and SES, which are products of the community in which school is located (Hill & Hill, 1994). The role of leaders is limited in such contexts where a large proportion of student lives in poverty or come from disadvantaged backgrounds (Lovely, 2004). The literature provided contradictory evidence regarding the role of leaders in such schools. For instance, while some scholars suggested that principals should employ other effective

prevention and intervention strategies that are beyond specific leadership styles (e.g. instructional leadership and distributed leadership), and focused on establishing a safe school (Burke, 2008), others argued that leaders do not have potential to react to violent incidents since they are not prepared for dealing with crises in such conditions (Lovely, 2004). The question here is whether and how principals could reduce violence in their schools? Unfortunately, this research is not able to provide an answer to this question. However, it has been confirmed through the current study that reducing the size of schools, particularly those populated with high numbers of low socio-economic students is an indispensable means of intervention to the issue of violence in schools at the policy level.

Finally, although the present study provides substantial implications with regard to the relationship between leadership and school climate, the findings should be considered with the limitations inherent in the study. First of all, the constructs of leadership and climate are based on principals' perceptions, meaning that they are asked to judge their own leadership practices and the climate of the school which they are in charge of. This involves the potential to undermine the objectivity of the data. This leads us to pose the question: whether a study drawing upon teachers' perception of leadership and climate could reveal distinct results (Ham, Duyar, & Gumus, 2015)? Second, no statistic relationship between instructional and distributed leadership theories, and school violence should not be interpreted as that principals are useless in reducing the violence in their schools. There might be still strategic leadership practices that are conducive to creating safe school environment. However, identifying such practices is beyond the scope of this research, which calls for future research to detect specific leadership practices that can effectively diminish unsafety and violence in schools.

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