ORGANIZATIONAL LEADERSHIP, TEACHER WORK CONDITIONS AND TEACHERS' JOB SATISFACTION: A MULTI-COUNTRY ANALYSIS

By

Madhur Chandra

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ABSTRACT

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The notion that principals' actions create distinct working environments in schools and that these environments are associated with teacher satisfaction is well established in the United States (Johnson, Kraft & Papay, 2011; Moore, 2012; Grissom, 2011). As part of the process of creating a supportive work environment principals may also take steps to establish a culture of collaboration among teachers. Notably however, multi-country analysis examining principal leadership and teacher satisfaction is limited and a specific focus on Asia is missing from the existing literature on the subject. Similarly, the relationships between teacher collaboration, principal leadership and teacher satisfaction across varying social, cultural, and economic contexts are understudied. This dissertation consisting of three interrelated papers is a systematic effort to address this gap in the literature. Chapter 1 in this dissertation is an extensive analytic review of teacher work conditions associated with teacher satisfaction within the United States and internationally. This chapter is foundational because it identifies gaps in the literature on teacher satisfaction. Based on this analytic review I focus on two relational and policy amenable organizational factors – principal leadership and teacher collaboration in the two chapters that follow.

Chapter 2 explores the association between principal leadership style and teachers' job satisfaction in six Asian countries – Hong Kong, Indonesia, Malaysia, Mongolia, Taiwan, and Thailand, as well as the United States. I use a large-scale international dataset - the Trends in International Math and Science (TIMSS) 2007, which are the only large-scale secondary data

publicly available that represent several countries in Asia and specifically pertain to education. Additionally, TIMSS 2007 contain a comprehensive set of demographic and contextual variables that enable a rich analysis of the relationships of interest. Results indicate that two aspects of transformational leadership are significantly associated with principal reported teacher satisfaction across all the countries analyzed. These are identified as the principal's role in building a shared vision and mission for the school, which Leithwood and Sun (2012) name "setting directions" and the principal's role in capacity building within schools which they name "developing people."

Chapter 3 focuses on teacher collaboration in five OECD countries – Denmark, Poland, Brazil, Mexico and Hungary using the Teaching and Learning International Survey (TALIS 2008). A fractional response model is used to explore the association between factors measuring transformational leadership in these countries and a summative index of teacher collaboration. I also deconstruct the relationship between the leadership factors and twelve individual measures of teacher collaboration. Results indicate a predominantly positive association between factors measuring transformational leadership and individual measures of collaboration pertaining to classroom teaching and learning. Additionally, I find that in all five countries there is a strong positive association between the index of teacher collaboration and teachers' job satisfaction.

Thus, cumulatively the two large-scale data sets used in this dissertation – (TIMSS 2007 and TALIS 2008) generate a more comprehensive understanding of how particular aspects of teacher work conditions - principal leadership and teacher collaboration are associated with variations in teacher satisfaction in a multi-country context.

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I dedicate this dissertation to my girls Anjini, Kavya, and Divya who have remained my loving and enthusiastic supporters over the last five years and have kept me grounded.

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CHAPTER 1

TEACHERS' WORK CONDITIONS AND THEIR JOB SATISFACTION: A REVIEW OF THE LITERATURE

1.1 Introduction

There is a long and venerable tradition of research on job satisfaction and behavioral outcomes in industrial-organizational psychology (Judge, Parker, Colbert, Heller, & Illes, 2001; Judge, Bono, Thoreson & Patton, 2001). Indeed, interest in the links between workplace attitudes and behavioral outcomes in this field goes back several decades. Job satisfaction has been explicated in this literature as an affective reaction to an individual's work situation. Locke (1976) for example defined job satisfaction as "….a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences" (p.1304). According to him, job satisfaction is important for two reasons. First, from a humanitarian perspective it is indicative of the emotional well-being of employees. Second, from a utilitarian perspective job satisfaction can lead to behaviors that impact organizational functioning. It may be argued therefore, that research on job satisfaction is important from the perspective of organizational effectiveness.

As defined in this paper, job satisfaction refers simply to the extent of an individual's overall satisfaction with their job. Despite the extensive literature on the importance of job satisfaction in the industrial/organization literature, it has received comparatively less research attention within the field of education. Nonetheless, there is mounting evidence in the education literature as well in support of the finding that job satisfaction is associated with outcomes such as teacher turnover and student achievement. For example, it is well documented within the United States that job satisfaction is strongly associated with teacher turnover (Boyd, Grossman, Ing, Lankford, Loeb, Wyckoff, 2011; Ingersoll, 2001; Ostroff, 1992; Stockard & Lehman, 2004).

It is equally well-established that there is a high level of teacher turnover in U.S. public schools[2] (Boyd et al, 2011; Guarino, Santibanez & Daley, 2006; Ingersoll, 2001). Teacher turnover is both costly and disruptive for schools in the U.S.[3] Given the high rate of turnover and the fact that satisfaction is a known antecedent of turnover, extending our understanding of the correlates of teacher satisfaction appears to be both necessary and policy relevant.

Additionally, teacher satisfaction has direct implications not only for teacher turnover, but also for teacher commitment, and student achievement. Previous literature on job satisfaction and organizational commitment indicates that the two concepts are highly correlated and are in turn significantly associated with work conditions. If a person is satisfied with their job, they are also much more likely to be more committed to their work (Firestone & Pennell, 1993; Mowday, Steers & Porter, 1979). Concomitantly, more satisfied and committed workers are far less likely to leave their jobs than those that are dissatisfied (Perie & Baker, 1997).

Research shows that teacher job satisfaction also has a crucial influence on the student body. Highly satisfied teachers are likely to have more positive relationships with their students and are therefore, much more likely to help them attain better academic outcomes (Michaelowa & Wittmann, 2007). In addition, teacher satisfaction influences the stability and quality of instruction provided to students (Perie & Baker, 1997). Ostroff (1992) argues that teachers who are dissatisfied may not put forward their best effort in the classroom though they may continue to stay in teaching. Dissatisfied teachers are unlikely to actively engage with students. Systematic research on the correlates of teacher satisfaction can therefore, help to inform policy

[2] According to Boyd et al (2011) across the U.S. approximately half a million teachers leave their schools every year. Only 16% of this turnover can be attributed to retirement. The rest (84%) is attributed to the movement of teachers between schools and to teachers leaving the profession entirely.

[3] The National Commission on Teaching and America's Future (NCTAF, 2007) estimated that teacher turnover cost the nation more than $7 billion in the 2003-04 school year alone.

addressing teacher retention and commitment as well as policy aimed at improving student achievement.

1.2 Theoretical Framework

The goal of this review is to extend our understanding of the factors that matter for teacher satisfaction, particularly in the international context. I draw on a vast body of research on school climate and schools as organizations as a theoretical framework within which to explore the influence of teacher work conditions on teacher satisfaction across countries. Although there is not a single agreed upon definition of school climate, one way to think about school climate is in reference to the quality and character of school life (Cohen, Mccabe, Michelli, & Pickeral, 2009). Early systematic studies of school climate were influenced by organizational research and research on school effectiveness. Over the last three decades researchers have come to realize that a complex range of internal and external influences shape collective experiences of schooling. Briefly, school climate encompasses norms, values, and goals pertaining to the school, interpersonal relationships, teaching and learning practices and organizational structures.

It has been suggested that there are four main dimensions that shape school climate. These dimensions are identified by Cohen et al. (2009) as follows.

1. Safety – both physical and socio-emotional.
2. Teaching and learning – encompassing professional development, effective instruction and leadership support.
3. Positive relationships – among teachers, leaders, and staff, opportunities for collaboration and the establishment of a school community, morale and connectedness.

4. Environmental / Structural – Availability of adequate instructional materials, school size and clean facilities.

Figure 1 is a conceptual diagram of teacher work conditions and teacher satisfaction based on the school climate framework. In recognition of the complexity of internal and external influences that impact teacher outcomes, I include a comprehensive list of contextual variables – demographic, school, and organizational. I conceptualize these contexts as shaping teachers' work environments and hypothesize that specific aspects of these work conditions like principal leadership and teacher collaboration in particular influence teacher satisfaction based on the understanding that the school climate framework is to a large extent relational in nature. How connected or not teachers and students feel within schools is therefore, an important aspect of school climate. Although, teacher satisfaction is the outcome of interest in this review, satisfaction itself is also conceptualized as an important antecedent of teacher outcomes such as turnover and teacher commitment as well as student achievement as shown in Figure 1.

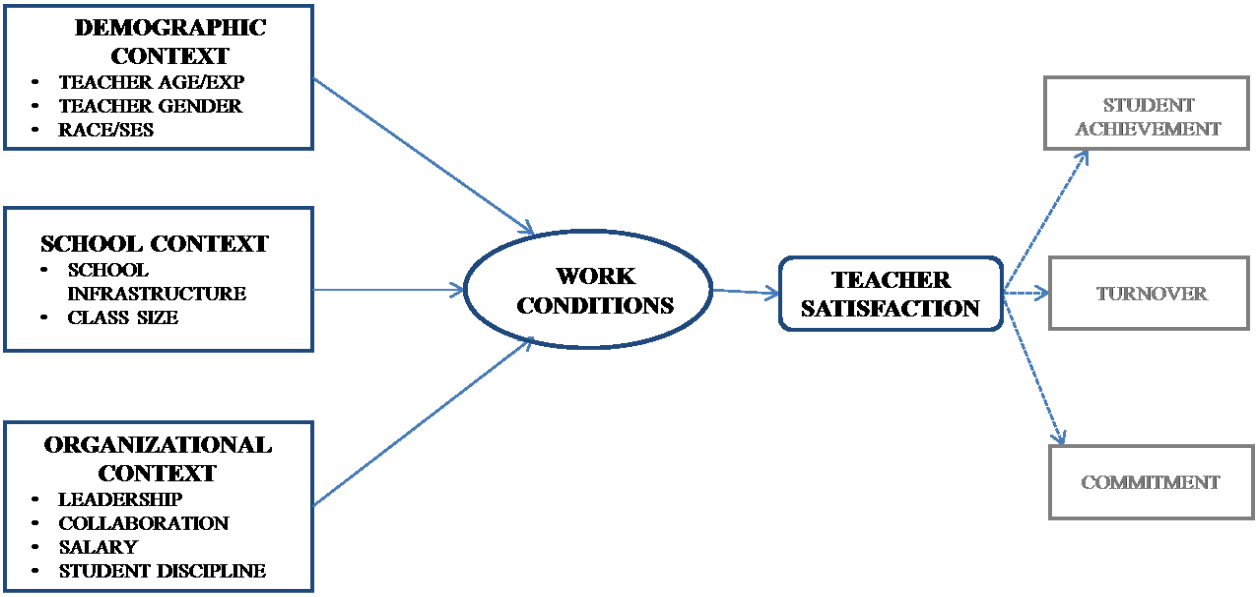

Figure 1: A Conceptual Diagram of Teacher Work Conditions and Teacher Satisfaction

Based on this theoretical framework, in the next two sections I review the methodology used to identify relevant literature on teacher satisfaction within the U.S. as well as internationally.

1.3 Methodology

In this section I describe the process used to identify relevant literature and the data that emerged as a result. A broad search of the literature on teacher satisfaction was conducted initially using a variety of search strategies. The search parameters were constrained to include all studies in the period between 1990 and 2013. First, I used the search engine Google Scholar with terms such as "teacher satisfaction," "work conditions," "teacher turnover," "job satisfaction" in conjunction with the Boolean operator "AND." Second, I conducted a separate search within major education journals like *American Educational Research Journal, Asia Pacific Educational Review, Comparative Education Review, Educational Administration Quarterly, Elementary School Journal, International Journal of Educational Development, Review of Educational Research, School Effectiveness and School Improvement, and Teaching and Teacher Education* among others. I used the search term "teacher satisfaction" as well as terms directly pertaining to aspects of teacher work conditions such as "teacher satisfaction AND principal leadership" and "teacher satisfaction AND collaboration." Finally, I reviewed the reference sections of all the retrieved articles in an attempt to identify additional relevant material that may have been missed by the earlier searches[4]. These methods together yielded over 90 articles.

Next, I examined the abstracts of each of the articles thus identified to ascertain whether they analyzed teacher satisfaction either directly or in the context of specific organizational conditions like leadership, autonomy and collaboration. The rationale for focusing on these

[4] Borman and Dowling (2008) follow a similar technique of citation searches.

organizational conditions is that an important dimension of school climate is relational. Collaboration, leadership and autonomy all reflect this dimension. Further, these are all policy amenable variables. Those studies that did not meet these criteria were excluded from the database for review. At the end of this process I retained a database of seventy-seven articles.

A review of this database revealed an overemphasis on studies that were U.S. based. Table 1 indicates that only twenty out of the seventy-seven articles were international in scope. Further, the vast majority of these studies were single-country studies (75 out of a possible 77). Only two of the studies identified classify as multi-country[5] studies.

Table 1: No. of Studies on Teacher Satisfaction
U.S.A. / International

	U.S.A	International	No.
Single	57	18	75
Multi-Country	0	2	2
Total	**57**	**20**	**77**

Interestingly, around three-quarters of the literature on job satisfaction was quantitative in nature. Table 2 shows a summary of the studies reviewed by region as well as study type. This table again indicates a paucity of international research on the subject. By far the largest number of studies reviewed (58) pertain to North America.

[5] I defined multi-country studies as those that analyzed two or more countries. One of these is a quantitative cross-country analysis of student outcomes based in Africa (Michaelowa & Wittmann, 2007) and the second is a multi-region as well as multi-country case-study of Europe and North America (Ylimaki & Jacobson, 2013).

Table 2: No. of Studies on Teacher Satisfaction by Region /Study Type

Region	Quantitative	Qualitative	No.
North America	40	18	58*
Africa	1	0	1
Europe	6	2	8
Asia	5	0	5
Middle East	4	0	4
Caribbean	1	0	1
Total	**57**	**20**	**77**

*Note: *Category N. America has 58 studies instead of 57 because 1 Canadian study is included here.*

One way to inform this literature further is to analyze correlates of teacher satisfaction across different social, cultural and organizational environments. However, such variation is difficult to obtain from a single country study. This review attempts to address this gap in the literature by examining teacher satisfaction and specific work conditions within the United States, as well as internationally. The guiding questions for this review are:

1. Is there variation in contextual factors associated with teacher satisfaction in a multi-country setting?
2. Are there specific aspects of schools as organizations that matter for teacher satisfaction?

1.4 A Review of Literature – U.S.

Research has shown that organizations with more satisfied employees tend to be more effective than organizations with less satisfied employees (Ostroff, 1992). Extending this understanding to schools, I hypothesize that more satisfied teachers are more likely to actively

promote student learning within their schools. In a post-NCLB[6] era where schools, teachers and students are under heavy pressure to exhibit yearly progress in student test scores, the issue of teacher satisfaction thus becomes especially salient. Accordingly, in this paper I first examine demographic factors such as teacher age, teacher experience, race and student socioeconomic status. This is followed by a review of school and classroom factors associated with job satisfaction in the U.S. such as school infrastructure and class size. Last, I review the literature pertaining to organizational factors associated with teacher job satisfaction. In this review the organizational factors I research are principal leadership, teacher collaboration and autonomy, teacher salaries and student discipline issues because these are all factors that are policy amenable. Identifying trends across countries in one or more of these factors therefore provides policymakers good insight into the school factors they may manipulate to improve school and teacher effectiveness going forward. Since job dissatisfaction is an important antecedent of teacher turnover in the U.S (see Boyd, et al 2011; Ostroff, 1992; Liu & Ramsey, 2008) I also include studies which focus on turnover as the outcome of interest (for the U.S. only[7]). Table A1 lists the main findings and data used for all studies reviewed including those on teacher turnover.

1.4.1 Demographic Factors

Prior literature on the effect of demographic variables indicates a statistically significant relationship between teacher satisfaction and teacher age and experience though the direction of this relationship is less clear. Ma and MacMillan (1999) for example, used teacher data from the New Brunswick Elementary School Study to explore how teacher professional satisfaction is

[6] No Child Left Behind (NCLB) Act 2001 in the U.S. which promotes standards based education reform and is based on the premise that setting measurable goals and high standards can improve individual education outcomes. NCLB is a reauthorization of the Elementary and Secondary Education Act.

[7] The literature on turnover is reviewed for the U.S. specifically because there is a well-established relationship between teachers' job satisfaction and teacher turnover within the U.S. The same cannot be said of international literature as international work on turnover and satisfaction is not as widespread.

related to background characteristics and workplace conditions and found that older teachers were less satisfied with their professional roles as teachers. Additional support for the fact that age is negatively correlated with satisfaction is provided by Perie and Baker (1997). In their study, younger teachers were categorized as having higher levels of satisfaction as compared with older teachers. Specifically, about "thirty-five percent of public secondary school teachers below thirty years of age [in their study] had high satisfaction levels versus less than twenty-five percent of teachers above forty years of age" (Perie et al, 1997, p.18). In the same study they showed that public school teachers with less than three years of experience tended to be more satisfied than teachers with between four and nine years of experience. Teachers in the middle group for years of experience in turn had higher satisfaction levels than the most experienced teachers with more than twenty years of experience. It should be noted however, that although these findings were statistically significant the differences were not large. Liu and Ramsey (2008) found that teachers' job satisfaction improved rather than decreased with years of experience.

The research with respect to age and turnover is similarly fairly consistent. Teachers who are very young (in their first couple of years of teaching) and those nearing retirement age are much more likely to leave teaching. Thus, the relationship between age and turnover tends to follow a U-shaped curve that has been well documented in the literature (Allensworth et al, 2009; Guarino et al, 2006; Johnson, 2006; Ingersoll, 2001).

The role of gender as an explanatory factor for teacher satisfaction, however, is less clear cut. Culver, Wolfle and Cross (1990) examined teacher satisfaction for Blacks and Whites separately and found that for both groups demographic variables such as age and gender were not very important as compared with school climate factors and this finding appears to be

consistent with more recent work on job satisfaction (Johnson, Kraft & Papay, 2011). However, other studies indicate that female teachers in general appear to be more satisfied with their professional role than male teachers. Perie and Baker (1997) for example, found that in their sample that the teachers who were identified as being the most satisfied were predominantly female. Levels of self-reported commitment are also thought to be higher for female teachers (Guarino et al, 2006). Similarly, Ma and MacMillan (1998) found a significant gender difference with respect to teacher satisfaction. Their study revealed that male teachers' sense of professional satisfaction appears to be more affected by the organizational culture of the school than that of female teachers.

A few scholars claim that there is an association between job satisfaction and student socioeconomic status (Shen, Leslie, Spybrook, & Ma, 2012; Grissom, 2011). They contend that job satisfaction is lower in schools serving a high percentage of disadvantaged students. There is a substantial literature on turnover in schools which also documents the phenomenon that teachers tend to leave schools with high concentrations of poor students (Borman & Dowling, 2008; Boyd et al, 2011; Scafidi, Sjoquist, & Stinebrickner, 2005, Hanushek, Kane, & Rivkin, 2004; Johnson, 2003; Shen et al, 2012; Rosenholtz & Simpson, 1990). This finding has negative implications for student achievement in high poverty schools (see Ostroff, 1992). High poverty, low performing schools rarely close the achievement gap because they are constantly dealing with staffing issues caused by the high rates of teacher turnover in these schools. "An inordinate amount of their capital-both human and financial is consumed by the process of hiring and replacing beginning teachers who leave before they have mastered the ability to create a successful learning culture for their students" (Barnes, Crowe, & Schaefer, 2007, p.4). In contrast to this body of work, Ingersoll and May (2011) find that after controlling for other

school demographics the effect of high poverty student enrollment on turnover is no longer statistically significant.

The role of race as a determinant of teacher satisfaction as well as teacher retention also appears to be important in this literature. Some scholars such as Renzulli et al (2011) and Fairchild, Tobias, Corcoran, Djukic, Kovner and Noguera (2012) have researched the issue of student-teacher racial mismatch and its impact on satisfaction. These scholars assert that teacher satisfaction is higher when the teacher shares the same race as the student. They highlight that race matters for teacher satisfaction and that white teachers are likely to be more satisfied teaching predominantly white students. Thus, the ethnic composition of the student body is considered by some scholars to be an important determinant of teacher satisfaction.

The literature on turnover also appears to support this finding. Hanushek et al (2004) for example found that white teachers regardless of work experience are more likely to move to schools with lower percentages of African American and Hispanic students. Similarly, Scafidi, Sjoquist and Stinebrickner (2005) provide empirical evidence to support the claim that race matters. They assert that "a one standard deviation increase in the proportion of black students in a school increases the probability that a "median type" teacher will exit a particular school in a particular year by more than twenty percent, whereas one standard deviation changes in student test scores, poverty or teacher pay lead to only small changes in overall exit probability (Scafidi et al. 2005, p.6)." Other scholars such as Ingersoll and May (2012), and Borman and Dowling (2008) have also found that the percentage of minority students is significantly associated with white teacher turnover after high poverty status of the students is held constant. Further, the greater the percentage of minorities (Blacks and Hispanics) in a school, the lower is the average teacher rating of work conditions (Boyd et al, 2011).

Regardless of whether student demographics are strongly related to teacher satisfaction, these factors are difficult to change from the policy perspective. There is however, a large body of scholarly work that examines specific components of organizational culture and work conditions as well as other school factors as determinants of teacher satisfaction. Section 1.4.3 reviews this body of literature and identifies policy amenable factors associated with teacher satisfaction. This more organization-centric view of teacher retention and satisfaction is espoused by scholars like Horng (2009), Ladd (2011), Liu and Meyer (2005), Ingersoll & May (2011), and Johnson, Kraft, and Papay (2011) among others. According to Horng, teachers consider work characteristics such as administrative support, salaries, class sizes and facilities to be more important than student characteristics with respect to turnover decisions. Horng theorizes that teachers are choosing to move out of high minority/high poverty districts based on the tougher work conditions they face in these districts rather than the student characteristics within the district. Other scholars like Ladd (2011) and Johnson, Kraft and Papay (2011) have also found that working conditions are significantly associated with teacher satisfaction and movement independent of other school characteristics such as the race of the student. They contend that the apparent relationship between student demographics and teacher turnover is driven not by teachers' responses to their students but by the work conditions teachers have to cope with. According to these scholars, measures of the school environment account for much of the relationship between student demographic characteristics and teacher satisfaction and turnover.

1.4.2 School/Classroom Factors

Few scholars have specifically focused on the relationship between school location, class size, and teacher satisfaction. These variables are typically included as correlates in most models. With respect to school type, Perie and Baker (1997) found that private school teachers

tend to be more satisfied than public school teachers and elementary school teachers are more satisfied than secondary school teachers. They did not however, find a significant association between class size and teacher satisfaction.

A few studies in the U.S. have also specifically focused on the role of school facilities with respect to teacher satisfaction and retention (Schneider, 2003; Buckley, Schneider & Shang, 2005). These scholars underscore the importance of good school facilities as central to the process of teaching and learning and the health and safety of the teachers and students. Buckley et al. (2005) argue that serious deficiencies with respect to school facility have been noted in several urban school districts all over the United States. Issues with indoor air quality in these buildings have been associated with increased student absenteeism and reduced student performance as well as a decrease in teacher health. Not surprisingly, urban teachers are less likely to report satisfaction in their jobs (Buckley et al, 2005; Hanushek & Rivkin, 2007). Buckley et al. (2005) contend that the benefits of facility improvement for teacher retention are greater than or at least equal to those from salary increases. Arguably, since facility improvement is a one-time fixed cost this factor also appears to be more cost-effective in terms of teacher retention than across the board salary increases for teachers.

The work of Schneider (2003) corroborates Buckley et al's research with respect to the role of school facilities. Schneider found that inadequate school facilities negatively impact the quality of instruction delivered by teachers, which in turn may affect student achievement. The teachers interviewed by Schneider (2003) strongly believed that the existing school conditions were definitely affecting their future career decisions. In the Schneider study, teachers from Chicago and Washington D.C. were asked to record their perception of working conditions within their schools. On a graded scale (A-F) most teachers gave their school facilities a C with

respect to facilities and maintenance. Over forty percent of teachers had issues with class size. About a third of the teachers reported having little or no teacher workspace. Most teachers were also concerned about poor indoor air quality, poor lighting and dirty restrooms. Further, a majority of teachers in Chicago as well as Washington D.C. were of the opinion that the high noise level in their hallways was negatively affecting their ability to teach. As Johnson (2006) aptly observed, poorly maintained schools send a negative signal about the state of public education because they indicate that public education is low on the list of a community's priorities. Given the apparent influence of school facilities further research appears to be necessary to get more clarity on the importance of school facilities vis-à-vis teacher satisfaction and other organizational factors.

1.4.3 Organizational Factors

Ostroff (1992) has shown that satisfied employees tend to be more effective within organizations. Accordingly, this section summarizes the research on teacher satisfaction and turnover with respect to the organizational milieu within schools. I specifically focus on school organizational factors such as principal leadership, teacher collaboration, teacher autonomy, teacher salaries, student behaviors and student discipline and teachers' job satisfaction.

Research on school organizations has found that work condition factors such as administrative support and teacher control over classroom procedures are important for teacher satisfaction (Culver et al., 1990; Perie & Baker, 1997; Taylor & Tashakkori, 1995). This finding has been corroborated elsewhere in the literature as well (see Bogler, 2002; Guarino et al, 2006; and Stockard & Lehman, 2004). In keeping with this view, other scholars have researched various aspects of the work environment such as principal leadership, (Allensworth et al. 2009; Boyd et al, 2011; Brown & Wynn, 2009) teacher autonomy, and teacher participation in school processes (Ingersoll, 2001; Johnson & Birkeland, 2003).

In this review, a focus on leadership among the organizational factors within a school context is motivated by the fact that the principal is considered to be a central figure in any discussion of the school as a workplace. As a key figure in school administration, the principal is responsible for making decisions in the day-to-day life of schools, which impact the social life of the school and all those who work in it (Lortie, 1975). As the official head of the school, the principal is also the "instructional leader of the school" (Lortie, 1975, p.197). Thus, it is the principal who allocates the resources that alter teacher working conditions and to a great extent, principals' actions create distinct working environments within schools which are associated with teacher satisfaction.

Given that the teacher-principal relationship is a complex one, several scholars have focused their research specifically on how principal leadership affects teacher satisfaction and retention. Rosenholtz (1990), and Lee et al. (1991) for example, found that "principal buffering" is particularly helpful for novice teacher commitment. This is because in "loosely coupled" public schools this buffering action allows teachers the autonomy they need to manage their classrooms effectively. Similarly, Moore (2012) found that principal leadership decreased the odds of teacher dissatisfaction while student problems increased teacher dissatisfaction. Principal leadership also emerged as a strong predictor of teacher satisfaction in the work by Taylor and Tashakkori (1995) and Stockard and Lehman (2004).

Hulpia, Devos, and Rosseel (2009) delved a little further into the concept of principal leadership by centering on the notion of distributed leadership. Distributed leadership according to Hulpia et al., is the formal distribution of supervisory and supportive leadership functions and is indicative of interactions between members of a cohesive leadership team. Implicit in the notion of distributed leadership is participative decision-making of the entire leadership team.

Hulpia et al's research examined the relationship between distributed leadership, context variables and teacher satisfaction and commitment. They found that the cohesion of the leadership team and the amount of leadership support was indirectly related to job satisfaction. The authors failed to find a significant relationship between participative decision-making and job satisfaction (see Taylor & Tashakkori, 1995 for similar findings).

Previous literature on leadership has often centered on the principal's supervisory role within schools. Interestingly, Hulpia et al. (2009) found that supervision as a leadership function played little role in predicting teacher job satisfaction. In fact, supervision was not significantly related to either teacher job satisfaction or organizational commitment. This finding is important because it has implications for teacher evaluation. Specifically, it implies that schools where teachers are regularly evaluated and which have several formative or summative assessments do not necessarily have more satisfied or committed teachers. This study also underscores the fact that not all leadership functions should be distributed. In particular, supervision of teachers may need to be concentrated within one leader.

Several studies have examined the link between principal leadership and retention as well (Allensworth, 2009; Boyd et al., 2011; Culver et al., 1990; Ingersoll & May, 2012; Ladd, 2011, Pogodzinski, Youngs, Frank & Belman, 2012). Overall, these studies have found that administrative climate and leadership are associated with teachers' career decisions.

A second organizational factor I focus on in this review is collaboration. Much has been written about the isolated nature of teaching in previous years. Lortie (1975) noted this phenomenon of teacher isolation, which he attributed to the "egg-crate" nature of schools. Thus defined, school structure in the U.S. acts as a disincentive to teacher collaboration. The "egg-crate" structure of schools notwithstanding, the notion of teacher collaboration appears to be

capturing the attention of the scholarly community in recent years. Underscoring the importance of teacher collaboration, Ladd (2011) asserts that the notion of collaboration is central to any discussion on the workplace. Within the scholarly community there is an understanding with respect to collaboration that cultures that promote collaboration are the ones most positively associated with higher satisfaction and retention among teachers. Johnson and Birkland (2003) for example, found that teacher retention was higher with "integrated professional cultures" organized around collegial efforts. Support for teacher collaboration is also provided by Culver et al. (1990), and Rosenholtz (1990). In particular, Rosenholtz (1990) found significant differences with respect to progress made on reforms between schools where teachers collaborated and those where they did not. She concluded that when teachers have shared goals for student learning and achievement, students benefit. However, while these results look promising in terms of teacher retention and satisfaction, further research is necessary to get a more robust picture of the effects of teacher collaboration on teacher satisfaction.

Scholars have also examined teacher autonomy as an explanatory factor for teacher satisfaction as well as teacher retention. Autonomy as a concept has been explicated as "a worker's freedom to schedule work and determine the procedures used to carry it out" (Firestone & Pennell, 1993, p.498). Autonomy leads to successful instructional practice because teachers can identify ways in which their own work contributes to student learning. There is a consistently positive relationship between teacher autonomy and satisfaction. For example, Moore (2012) found that teacher autonomy decreased the odds of teacher dissatisfaction. Perie and Baker (1997) noted that teachers with greater autonomy showed higher levels of satisfaction than teachers who felt they had less autonomy. Similarly, Renzulli et al (2011) and Lee et al (1991) in their work on teacher satisfaction provided support for organizational models that

promote autonomy. Elsewhere in the literature the loss of autonomy has been notably associated with teacher burnout.

The relationship between autonomy and turnover is also fairly unambiguous. Ingersoll and May (2011) found that schools with higher average levels of classroom autonomy had lower levels of turnover. The turnover of math teachers was especially strongly related to classroom autonomy. Ingersoll et al reported that a one unit increase in autonomy was associated with a seventy percent decline in the odds of a math teacher departing. For science teachers, however, classroom autonomy was not significantly associated with turnover. Another surprising finding with respect to autonomy is that it has the potential to ameliorate the negative impact of racial mismatch on teacher attitude (Renzulli et al, 2011).

The literature is not definitive about the association between teacher salary and teacher satisfaction and retention. Some studies have uncovered a weak relationship between teacher compensation and teacher satisfaction and retention (Ingersoll & May, 2012; Lee, et al. 1991; Perie & Baker, 1997). Others, such as Liu and Meyer (2005) have found low compensation to be a leading cause of teacher dissatisfaction. Low salaries have also been associated with increased organizational commitment (Firestone & Pennell, 1993). This finding is somewhat counterintuitive if we consider the labor market theory of supply and demand (see Guarino et al. 2006). Firestone et al. (1993) however, explicate this finding by suggesting that workers with low salaries develop alternative rationales for remaining at their job. Still others find that salary is less important than work conditions vis-à-vis teacher satisfaction (Hanushek, Kane, & Rivkin, 2004; Hanushek & Rivkin, 2007; Horng, 2009). Horng (2009) for example finds that on average the difference between $0 and $8000 in additional annual salary is not as important as

differences between a clean and safe work environment versus not having such an environment or having administrator support versus not having administrator support.

As a counterpoint to the weak relationship mentioned above, much of the retention literature provides extensive empirical evidence that teachers are more likely to transfer when they work in districts paying lower wages especially relative to alternative wage opportunities (Allensworth et al. 2009; Loeb, Darling-Hammond, & Luczak, 2005; Guarino et al. 2006; Hanushek, 2004). Loeb et al. (2005) for example, contend that an increase in relative salaries from one to two times the local wage decreases turnover by seventy-five percent. However, others such as Johnson (2006) find that teachers are more likely to report intent to leave due to poor working conditions than due to salary.

A number of studies have established a negative relationship between poor student discipline and teacher satisfaction (Ingersoll, 2001; Liu & Meyer, 2005; Perie & Baker, 1997). In fact, student discipline issues have been cited as a major reason for teacher dissatisfaction, second only to compensation (Liu & Meyer, 2005). Kennedy (2005) in her book showed how teachers are urgently driven by a need to maintain lesson momentum, avoid disruptions at all costs, and move through their day in an orderly and stable way. Student discipline issues are perceived by teachers as a disruption that takes time away from the process of teaching and learning. Given the high importance teachers attach to maintaining classroom discipline at all costs the finding that assignment to a safe and orderly school is one of the most significant influencers of satisfaction (Stockard & Lehman, 2004) is hardly surprising.

Understanding teacher dissatisfaction with student discipline problems also has the potential to provide some insight into teachers' initial enthusiasm for the profession and their subsequent wish to leave teaching. For many individuals student discipline problems may act as

a check to initial idealism about teaching because they are now forced to deal with students who do not come to school motivated to learn. This may be the case in inner city schools that typically experience higher student discipline problems (Ingersoll, 2001) as well as higher rates of turnover. Within the range of teachers, Liu and Meyer (2005) found that minority teachers expressed more disappointment with student discipline issues than non-minority teachers.

Based on these observations, policy interventions that use financial incentives to address teacher turnover and dissatisfaction may fail to adequately address student discipline problems because the correlation between teachers' perceptions of student discipline issues and compensation is fairly low. Liu and Meyer (2005) interpret this to imply that teachers' satisfaction with the financial aspects of their profession has little bearing on their dissatisfaction with student discipline problems. In other words, increasing teacher salaries does not compensate for the disappointment teachers experience with respect to their students' behavioral issues. A more effective policy solution to address discipline issues and improve teacher satisfaction may be to improve the quality of daily communication between parents and teachers with respect to student problems. Parents have a good understanding of the behavioral issues of their children. Enlisting parental support to address disciplinary issues before they become a problem ensures that teachers are not left to single-handedly cope in the classroom.

The turnover literature too notes a significant relationship between student discipline and the likelihood of teacher turnover. Turnover rates are lower in schools with lower levels of discipline problems. Ingersoll (2001) for example, found that "a one unit difference in reported discipline problems between two schools is associated with a forty-seven percent difference in the odds of a teacher departing" (Ingersoll, 2001, p.518). Ingersoll and May (2011) have found a similar association between poor behavioral climate in schools and turnover.

While the literature points to a clear association between student discipline and teacher satisfaction, we do not as yet have a clear understanding of the causal mechanisms by which student discipline problems make teachers discontented with their profession or policy solutions that might help mitigate discipline problems.

In summary, recent work that is U.S. based appears to indicate that organizational factors tend to explain more variation in teacher satisfaction than do demographic factors. Notwithstanding this understanding, gaps remain with respect to the kinds of organizational factors that really matter for teacher satisfaction as well as the processes by which these organizational factors affect satisfaction. The next section briefly reviews the international literature on satisfaction.

1.5 A Review of Literature – International

In contrast to the relatively well-documented body of work on teacher satisfaction and retention in the U.S., there is a limited literature on teacher satisfaction in the international context. Internationally, teacher satisfaction has been researched in a somewhat piecemeal fashion with the research spanning a diverse selection of countries such as China, Norway, Albania, Israel, Cyprus, the United Kingdom and Australia. The section below attempts to briefly summarize salient findings from this collection of scholarly work and to highlight points of divergence from the U.S. literature on teacher satisfaction.

1.5.1 Demographic Factors

Most studies conducted internationally have found that context is a powerful predictor of overall teacher satisfaction. Zembylas and Papanastasiou (2004) for example, explored teacher satisfaction in Cyprus and found that unlike teachers in developed countries like the U.S., U.K., Australia and New Zealand, Cypriot teachers choose to be in the teaching profession because of

salary, working hours and holidays. Their career choice appears to be guided more by pragmatic considerations than professional idealism. Additionally, teacher age was significantly associated with higher satisfaction in their study. Since the main criterion for promotions in Cyprus is experience, the authors attributed the importance of the age variable to the significant increase in salary and promotions that Cypriot teachers receive over time based on experience. Another possible explanation is that as teachers improve their teaching practice their satisfaction levels also go up.

In Jinzhou, younger and less experienced teachers were found to be more satisfied than older teachers (Chen, 2010). However, in the Gansu province of China, Sargent and Hannum (2005) found that the most dissatisfied teachers were the youngest teachers and the most senior teachers (indicating a U-shaped curve for the age variable). Additionally, female teachers were more satisfied than male teachers. These divergent results in different countries are perhaps explicable by fact that contexts differ in different places.

Using a large-scale dataset (PASEC), Michaelowa and Wittmann (2007) researched teacher satisfaction and its impact on education quality in Francophone Sub-Saharan Africa. In addition to the positive correlation between teacher satisfaction and student achievement, they found that if a teacher's qualification increased beyond a certain level (Bachelor's degree) it resulted in a mismatch between professional realities and teachers expectations and actually decreased teacher satisfaction in the net. Sargent and Hannum (2005) also found that better qualified teachers tend to feel more dissatisfied than do less qualified teachers.

Internationally, there appears to be comparatively less focus on race vis-à-vis teacher satisfaction. However, Sargent and Hannum (2005) did find that teachers who are more socially similar to the local community are more satisfied than those that are not. With respect to

socioeconomic status of students Sargent and Hannum (2005) found that village income significantly differentiates satisfied and dissatisfied teachers. Overall, more satisfied teachers appear to teach in schools where the economic resources for the support of teaching are more readily available.

1.5.2 School/Classroom Factors

With respect to school infrastructure, Sargent and Hannum's (2005) findings in the Gansu province of rural China corroborate those in the U.S. more closely than the study by Chen (2010). Specifically, teachers in their analysis were found to be more satisfied in larger schools which have more resources and in schools with better opportunities for advancement. However, they also emphasize that a synergy between the teachers and the local community improved teacher satisfaction suggesting the importance of ties to local areas. Their study indicates that teachers in more remote areas are more likely to have higher satisfaction. This finding is somewhat counterintuitive until we look at the context in Gansu. It is possible that in Gansu ties with the local community are stronger than in most large urban cities thereby mitigating teacher dissatisfaction in that province. The role of school facilities with respect to teacher satisfaction was also found to be important in Albania and Jamaica (Kloep & Tarifa, 1994; Rogers-Jenkinson & Chapman, 1990).

With respect to class size, Michaelowa and Wittman (2007) found that a large class-size and double-shift classes were negatively correlated with both teacher satisfaction and student achievement. Although this is one of the few studies internationally that examines the effect of teacher satisfaction on student achievement, it does not include controls for correlates of satisfaction such as teacher autonomy and salary.

1.5.3 Organizational Factors

Among the scholars who have focused on organizational leadership internationally, Bogler (2001) found that the principal's transformational leadership affected teachers' satisfaction directly and indirectly through their occupational perceptions. In this study, teachers' occupational perceptions are understood as aspects of the teaching profession such as autonomy, professional development, professional prestige, instructional freedom etc. Bogler hypothesized that the more involved teachers are in decision-making, the more satisfied they are with their jobs. Support for the relationship between a teacher's participation in decision-making and job satisfaction was also provided by Zembylas and Papanastasiou (2005) in Cyprus. As expected, the authors found that teachers who are empowered to make instructional and organizational decisions have higher levels of satisfaction.

Two studies, one by Abu-Saad and Hendrix (1995) and another by Bogler (2002) examined teacher satisfaction in Israel. Both studies centered on principal leadership as the dominant organizational climate factor. They found that leadership and autonomy were significantly related to teacher satisfaction. The fact that principal leadership emerged as the dominant school climate variable associated with satisfaction is attributed by the authors to the power relationships within traditional Bedouin Arab communities in Israel in which power and responsibility lies with the leader. In these communities, the leader is central to providing direction, purpose and motivation and also key to determining the social relations of the group. School leadership also emerged as a predictor of teacher satisfaction in the UK, Australia and New Zealand (Dinham & Scott, 2000; Dinham, 2005). Interestingly, teacher satisfaction with their current workload was the strongest predictor of overall satisfaction in these countries. This finding points to the importance of context vis-a-vis teacher satisfaction in developed and

developing countries because teacher workload was negatively correlated with teacher satisfaction in rural China (see Hannum et al. 2005).

Positive social interactions with colleagues have typically been associated in the literature with reduced stress for teachers. In a follow-up to their 2004 study of Cypriot teachers, Zembylas et al. (2006) found that a main source of teacher satisfaction was working collaboratively with colleagues and having opportunities for personal and professional growth. This finding emphasizes intrinsic rather than extrinsic factors as the most significant source of teachers' job satisfaction. It also appears to be more in keeping with findings from developed countries and may potentially be common internationally regardless of country context.

Additional support for the satisfaction-collaboration relationship was provided by Skaalvik and Skaalvik (2011) who found that satisfaction was positively related to relations with colleagues, and relations with parents through teachers' feelings of belonging. Both feelings of belonging and emotional exhaustion were significantly related to job satisfaction.

Support for organizational structures that enhance teacher collaboration was also provided by Sargent and Hannum (2005). These authors found that opportunities for professional development also had a significant impact on teachers' job satisfaction. Working collaboratively with other teachers was found to be positively associated with teacher satisfaction in Cyprus (Zembylas, 2006) and in the study by Dinham (2000). Powerful dis-satisfiers identified in the Zembylas (2006) study included lack of adequate respect for teachers by the community, lack of collegial relationships, and lack of teacher autonomy. The lack of autonomy experienced by Cypriot teachers was attributed to country specific context as Cyprus has a centralized educational system. Professional autonomy was also found to be important in the Albanian context where it accounts for a considerable portion of the variance in job satisfaction

(Kloep & Tarifah, 1993). The work by Kloep et al. (1993) reveals that Albanian teachers in general appear to have good relationships with their colleagues. The strength of these good relations may help explain the high level of job satisfaction observed in that country.

Teachers' relationships with other teachers were also significantly related to teacher satisfaction in both public and private schools in Jamaica (Rogers-Jenkinson & Chapman,1990). Approximately twenty percent of the variance was explained by school factors such as interpersonal relationships with teachers, relationships with parents and organizational structure (identified by the authors as a collection of variables pertaining to teacher participation in the formation of school goals and policies as well as teacher autonomy).

Recent research by Chen (2010) in Jinzhou city in the north of China found that for Chinese middle school teachers' salary was significantly associated with teachers' future career plans and intent to move. Contrary to these findings, as well as, contrary to some research from the U.S., Sargent and Hannum (2005) did not find salaries to be significantly related to teacher satisfaction. Further evidence to support the notion that salary is not a key determinant of satisfaction is provided by Abd-el-Fattah (2010) whose study investigated the longitudinal effects of a pay-increase scheme in Egypt on teacher satisfaction. Their study showed that pay increase did not have a significant impact on teacher satisfaction. Further, the impact of pay increase was stronger for teachers with a high school diploma (low attainment) vs. those who had a university degree (high attainment). Male teachers, however, were more satisfied than female teachers with their profession indicating a significant gender effect associated with salary increase.

With respect to student discipline issues, most of the international studies reviewed found discipline issues are negatively associated with teacher satisfaction. The study by Skaalvik and

Skaalvik (2011) in Norway for example found that job satisfaction was negatively correlated with time pressure and discipline problems through the emotional exhaustion of teachers and motivation to leave the teaching profession. Similarly, Zembylas (2006) found that student discipline issues in Cyprus were negatively associated with Cypriot teachers' satisfaction levels.

Interestingly, in many of the international studies reviewed I found that major dis-satisfiers were primarily found in the broader societal context of which each school is a part rather than in the conditions of work within schools. In particular, the community's poor opinion of teachers and the perceived status of teachers were found to be powerful dis-satisfiers in Australia and Cyprus (Dinham, 2000; Zembylas, 2006). In Jamaica, school prestige was a significant predictor of satisfaction for public school teachers (Rogers-Jenkinson & Chapman, 1990). Specifically, the authors found that school prestige explained thirty-eight percent of the variance in teachers' satisfaction. The high level of importance to the school prestige variable is attributed to the fact that typically teachers' status in their community operates as a non-monetary incentive to offset low wages. In many countries, this understanding is being eroded by a perceived drop in teaching prestige thereby altering the incentive value of the job (Rogers-Jenkinson & Chapman, 1990). In this respect, Jamaican elementary school teachers differ from elementary school teachers in the United States.

In the U.S., teachers who are more satisfied assign a higher value to recognition by administrators and supervisors as compared to teachers in Jamaica. The latter appear to assign more importance to the reactions of the community. Another point of difference is the importance attached to improving school facilities in the Jamaican context. Results of this study suggest that one of the most direct ways to increase teacher satisfaction is to improve the physical conditions in which teachers work. Poor physical working conditions are also relevant

in the Albanian context as shown by Kloep & Tarifa (1994) though this factor does not seem to significantly alter teacher satisfaction there.

1.6 Policy Implications & Limitations of the Literature

This review shows that teacher satisfaction is considered to be an important antecedent of teacher turnover as well as student achievement at least within the U.S. From a policy perspective therefore, it is important to identify the correlates of teacher satisfaction. A fruitful approach for identifying such correlates is to analyze teacher satisfaction across diverse social, cultural and organizational situations. Yet, this review of the literature reveals certain limitations which are enumerated as follows.

1.6.1 Lack of Multi-country Analysis

The review suggests that only a few scholars (Sargent & Hannum, 2005 and Michaelowa & Wittman, 2007) have attempted to use large-scale survey data to understand and explore teacher satisfaction. Large-scale survey data have the advantage of generalizability of inferences within and across countries which is not necessarily true of self-collected or administrative data. Further, systematic multi-country analysis examining the relationships between teacher demographics, school demographics, organizational factors and teacher satisfaction has not been attempted.

1.6.2 Limited Focus on Asia

A specific focus on Asia is interesting because of its rich cultural diversity. However, as Table 1 shows, only five studies out of a total of seventy-seven studies reviewed are focused on teacher satisfaction in Asia. Two of these papers focus on rural China, 1 study is on Pakistan, 1 focuses on South Korea and the last is an analysis on Singapore. Other countries in Asia are seriously under represented. Research into the organizational factors that affect teacher satisfaction levels in the Asian context would help to extend existing knowledge about

determinants of teacher satisfaction in a region outside of North America. Such research has the potential to unearth links in the satisfaction-work condition relationship, which could help inform the scholarly work in this area within the United States as well.

1.6.3 Limited Attention to Important Correlates

Finally, the literature is ambivalent with respect to the relationship between demographic teacher attributes like teacher age, teacher experience and teacher satisfaction. Similarly, research on the role of school infrastructure and teacher satisfaction in different contexts is lacking. The analyses to follow will specifically examine the direction of the relationship between such demographic and school factors as teacher experience and school infrastructure with teacher satisfaction across multiple countries.

1.7 Conclusion

There is a dearth of systematic multi-country analysis examining the relationships between a comprehensive set of student, teacher school, and organizational factors and teacher satisfaction leaving considerable room for future analysis. Only a few scholars (Sargent & Hannum, 2005 and Michaelowa & Wittman, 2007) have used large-scale data to understand and explore the concept of teacher satisfaction. Further, despite a tentatively acknowledged connection in the literature between teacher collaboration in schools and school improvement there has been little systematic effort to understand the association between collaboration and teacher satisfaction, to examine whether principal leadership is associated with teacher collaboration in countries outside the U.S.A. or to parse out the kinds of collaborative interactions associated with principal leadership in international contexts. From a policy perspective, it is worth testing whether these relationships are generalizable internationally or whether they are more U.S. context-specific.

This dissertation addresses these gaps in the literature by conducting a systematic examination of teacher satisfaction with a focus on two key organizational factors - principal leadership and teacher collaboration. I limit my focus to these two factors because these are policy amenable variables that are also relational in nature. Specifically, in chapter 2, I analyze the relationship between principal leadership style and teachers' job satisfaction across six Asian countries (Hong Kong, Indonesia, Malaysia, Mongolia, Thailand, and Taiwan) and the United States to see if there is variation in the facets of principal leadership associated with teacher satisfaction in Asia as compared with the United States. An empirical analysis of aspects of leadership that affect teacher satisfaction levels in the Asian context will help to extend our understanding of teacher satisfaction internationally. Teacher collaboration has been conceptualized as an important factor contributing to teacher development. The beneficial effects of teacher collaboration are widely acknowledged in the United States. Teachers are encouraged to share and develop their expertise with each other and to make use of opportunities for collaborative lesson planning, classroom observations, peer coaching and mentoring. There is however ample opportunity for further empirical exploration of the relationship between teacher collaboration and teacher satisfaction in other developed and developing countries internationally. In chapter 3, I analyze five OECD countries – Denmark, Mexico, Brazil, Poland and Hungary, to generate a richer and more comprehensive understanding of teacher collaboration, school leadership and teacher satisfaction in a context outside of the United States. Since the literature on teacher collaboration is not definitive, my dissertation will contribute to the existing body of work by subjecting rich measures of teacher collaboration to rigorous empirical investigation in a multi-country setting using nationally representative large scale survey data – OECD's Teaching and Learning International Survey (TALIS 2008).

APPENDIX

Table A1: List of Studies Reviewed with Key Findings

No.	Author(s)/Year	Key Findings	Data Source/Sample Size
1	Abd-El-Fattah, S.M. (2010).	Pay increases did not have a significant effect on teachers' job satisfaction. Pay increases appear to increase male teacher satisfaction more than female teacher satisfaction.	Survey (N=155).
2	Abu-Saad, I., & Hendrix, V. L. (1995).	Principal leadership and autonomy were significantly related to teachers' job satisfaction. The more supportive the leadership style, the higher the satisfaction.	2 surveys administered - Wanous & Lawler's Job Satisfaction Survey ; Horowitz and Zak's organizational climate survey (N=373 teachers)
3	Achinstein, B. (2002).	A focus on micro-political processes (border, politics, and ideology) in teacher communities provides different opportunities for organizational learning.	2 urban public middle schools in San Francisco Bay Area (6th-8th grade)
4	Allensworth, E., Ponisciak, S., & Mazzeo, C. (2009).	Student classroom behavior was the strongest predictor of mobility. Teachers were more likely to stay in schools where they have supportive leadership and opportunities to collaborate.	Teacher personnel records: Elementary school survey data from 2002-3 to 2006-07 (N=16,000 ES teachers)
5	Barnes, G., Crowe, E., & Schaefer, B. (2007).	Turnover costs were significant at the district as well as school level. Teachers leave high minority/low performing schools at higher rates. Low levels of teacher experience were associated with high turnover but other teacher demographics not significantly associated.	Own data in 5 school districts. Database linked to CCD
6	Bogler, R. (2001).	Principals' transformational leadership affected teachers satisfaction both directly and indirectly through their occupational perceptions.	MLQ (transformational behavior); Friedman's questionnaire (decision-making style),Yaniv's questionnaire (occupational perceptions). N=930 (teachers) Not random sample
7	Bogler, R. (2002).	They constructed profiles of teacher satisfaction using discriminant analysis. Teacher perceptions of their occupations and principal leadership styles were used as predictors	Quantitative questionnaire administered in 1997 to 930 teachers
8	Borman, G. D., & Dowling, N. M. (2008).	Personal characteristics of teachers (backgrounds and qualifications) were found to be important predictors of teacher turnover. Teacher attrition was more strongly moderated by characteristics of teachers' work conditions than previously noted in the literature.	Meta-analysis and review of the literature (N=34 studies)

Table A1 (cont'd)

No.	Author(s)/Year	Key Findings	Data Source/Sample Size
9	Boyd, D., Grossman, P., Ing, M., Lankford, H., Loeb, S. & Wyckoff, J. (2011).	Teachers' perceptions of school administration have the greatest effect on teacher retention. Dissatisfaction with work conditions was the number one reason given by teachers for leaving. Lack of administrative support was the most cited reason for dissatisfaction with work conditions.(40%)	Administrative data provided by the NYCDOE (N= 4360 teachers)
10	Branch, G.F., Hanushek, E.A., & Rivkin, S. G. (2013).	Management of teacher quality is an important pathway through which principals affect school quality.	Administrative data constructed as part of the UTD Texas Schools Project (N=7420 principals)
11	Brown, K. M. & Wynn, S. R. (2009).	Teacher retention is higher if principals are proactive in supporting new teachers. Specifically, a commitment to professional growth/excellence, supporting collegiality among teachers and fostering unofficial professional learning communities are important.	Existing Literature. N=12 ES principals
12	Buckley, J., Schneider, M., & Shang, Y. (2005).	Facility quality is an important predictor of teachers' decisions to leave their current employment.	Self-collected survey data, Washington D.C. (N=N/A)
13	Cha, Y.-K., & Ham, S.-H. (2012).	Teacher collegiality is understood largely as teachers' collective effort to deal with uncertainties that arise from their approach to teaching as a constructivist endeavor.	OECD Teaching and Learning International Survey, TALIS 2008 (N=149 Schools)
14	Chen, J. (2010).	Chinese middle school teachers were more satisfied with social acknowledgement and interpersonal relationships that with leadership, salary, physical work conditions and opportunities for advancement.	A convenience sample of 294 teachers in Jinzhou City in China
15	Cosner, S. (2009).	Broad actions taken by the principal regarding cultivation of collegial trust were important. These included an increase in interaction time within department meetings, staff meetings, and site-based professional development	Self-collected data on 11 nominated HS principals
16	Culver, S.M., Wolfle, L.M., & Cross, L.H. (1990).	The study found that demographic controls were of little importance compared to school climate variables.	Representative sample of public school teachers in Virginia obtained from the Virginia DOE (N=722 teachers)

Table A1 (cont'd)

No.	Author(s)/Year	Key Findings	Data Source/Sample Size
17	Dinham, S. & Scott, C. (1998).	Teacher experience was positively related to satisfaction on the following scales - school leadership; school infrastructure; school reputation; student achievement and self-growth. It was significantly negatively related to the merit promotion scale.	Self-collected (N=892 teachers)
18	Dinham, S. (2005).	School Leadership (inclusive of teacher leadership) was found to be a key factor in the achievement of outstanding educational outcomes.	Self-collected (N=38 secondary schools in New South Wales)
19	Fairchild, S., Tobias, R., Corcoran, S., Djukic, M., Kovner, C., & Noguera, P. (2012).	Components of relational demography directly affect teacher job satisfaction over and above the effects of work attitudes.	2003-04 SASS (N=8,665 teachers in 1,992 schools)
20	Fallon, G. & Barnett, J. (2009)	This study found that trust was the glue that held people together and kept collaboration going. However, participants limited critical analysis of one another's practices completely off the agenda thereby also limiting collegial interaction in some senses.	Self-collected (N=18 teachers)
21	Firestone, W. A., & Pennell, J.R. (1993).	The authors found that seven key workplace conditions - feedback, participation, collaboration, autonomy, job design characteristics, resources, and learning opportunities all contribute to teacher commitment.	Existing Literature
22	Grissom, J.A. (2011).	Principal effectiveness is associated with greater teacher job satisfaction and a lower probability that the teacher leaves the school the same year. The positive effects of principals are even greater for disadvantaged schools.	2003-04 SASS; 2004-05 Teacher Follow-up survey (N=30, 690 teachers in 6290 schools)
23	Grissom, J. A. & Loeb, S. (2011).	The article shows that organization management effectiveness is particularly important for school improvement. Their findings are not consistent with the notion that instructional leadership is important. Teacher satisfaction is not associated with Instructional Management.	Self-collected survey data on principals, asst principals, teachers, students, and parents combined with administrative data (N=314 principals; N=482 teachers)

Table A1 (cont'd)

No.	Author(s)/Year	Key Findings	Data Source/Sample Size
24	Guarino, C.M., Santibanez, L., & Daley, G.A. (2006).	Teachers teaching in urban and high poverty schools and those reporting dissatisfaction with salary had higher attrition rates and a decreased commitment to teaching. Schools with higher levels of collegiality and administrative support had lower attrition.	Existing Literature (N=46 studies)
25	Hanushek, E. A., Kain, J. F., & Rivkin, S.G. (2004).	Teachers transfer or exit from the Texas school system more as a reaction to the characteristics of their students than in response to better salaries in other schools. This leaves disadvantaged students with relatively inexperienced teachers.	Self-constructed database on Texas public schools
26	Hanushek, E. A., & Rivkin, S.G. (2007).	Difficult working conditions drive much of the difference in the turnover of teachers and the transfer of teachers across schools. Overall salary increases for teachers are expensive and ineffective.	Texas public school data
27	Horng, E.L. (20 09).	Teachers identify working conditions such as school facilities, administrative support, class size and salary as more important than student characteristics when selecting a school to work in.	Survey data (N=531 teachers)
28	Hulpia, H., Devos, D., & Rosseel, Y. (2009).	Context and leadership variables explained 47% of the variance in the model on organizational commitment. Context variables have a small and significant association with job satisfaction. Leadership variables are the most important for job satisfaction.	Self-collected survey (N=1522 teachers)
29	Ingersoll, R.M. and May, H. (2011).	Organizational conditions were strongly related to minority teachers departing. The degree of individual classroom autonomy and the level of collective faculty decision making were the organizational factors most sig associated with minority turnover. These factors were more significant than salary, classroom resources or teacher professional development.	Uses all 6 cycles of SASS, Teacher Follow-up Survey
30	Ingersoll, R.M. (2001).	Teacher job dissatisfaction accounts for much of teacher turnover. The data show that in particular inadequate support from school administration, student discipline problems, limited faculty input into decision making, and to a lesser extent low salaries are all associated with higher rates of turnover after controlling for the characteristics of both teachers and schools.	1991-92 SASS/TFS (N=6733 ES/Secondary teachers)

Table A1 (cont'd)

No.	Author(s)/Year	Key Findings	Data Source/Sample Size
31	Johnson, S. M., Kraft, M. A., & Papay, J.P. (2011).	Teachers who are more satisfied tend to stay longer in schools with a more positive work context independent of student demographics. The specific elements of school work conditions that matter most to teachers are the social conditions - principal leadership, school culture, and relationships among colleagues. Providing a supportive context in which to work (for teachers) appears to improve student achievement	MassTeLLS- Survey data (N=25,135 teachers in 1,142 schools)
32	Johnson, S. M. (2006).	Remarkably few low income schools provide the working conditions (opportunities for collaboration and professional development, safe facilities, flexible curriculum) that teachers need to do their job well. When teachers are sustained and successful in their work they are more likely to stay teaching.	Review of existing literature
33	Johnson, S. M., & Birkeland, S. E. (2003).	For beginning teachers the respect and support of administrators was key to their satisfaction.	Project on the Next Generation of Teachers (N=50 teachers)
34	Judge, T. A., Parker, S. K., Colbert, A. E., Heller, D., & Ilies, R. (2001).	This is a conceptual review of job satisfaction. The chapter provides an overview of major situational, dispositional theories of job satisfaction.	Review of existing literature
35	Judge, T.A., Thoreson, C. J., Bono, J. E., & Patton, G.K. (2001)	Their meta-analysis (N=312) reveals that the mean true correlation between job satisfaction and job performance is .30	Review of existing literature
36	Kelchtermans, G. (2006).	A cultural and a micropolitical perspective are required to disentangle collaboration, and autonomy and they should be understood as mediated by other workplace conditions.	Review of existing literature
37	Kennedy, M. (2005).	The circumstances of daily teaching compel changes not the persuasiveness of reform ideas. Professional development programs have the potential to make powerful changes in teaching practice.	Self-collected data with purposive sampling (N=45 teachers in 16 schools)
38	Kloep, M., & Tarifa, F. (1994).	Teachers in general are quite satisfied with their job in Albania. Autonomy is very important for teacher satisfaction in the Albanian context accounting for 27% of the variance in job satisfaction. Satisfaction is also predicted by job security, respect from the community and cooperation with colleagues.	Large scale survey (N=349 teachers)

Table A1 (cont'd)

No.	Author(s)/Year	Key Findings	Data Source/Sample Size
39	Koh, W. L., Steers, R. M., & Terborg, J. R. (1995).	Transformational leadership has substantial add-on effects to transactional leadership in the prediction of organizational commitment and satisfaction with the leader in this sample. It had little direct effect on student academic performance.	Self-collected data (N=100 randomly selected secondary schools)
40	Ladd, H. (2011).	Working conditions are highly associated with teachers intended departure from schools even after controlling for school demographics like race. School leadership emerges as the most salient dimension of work conditions	Administrative data (N=22,941 ES teachers, N=9,101 for MS; N=10,829 for HS)
41	Lee, V.E., Dedrick, R. F., & Smith, J.B. (1991).	Principal leadership, communal school organization, an orderly environment, and average levels of control granted to teachers influence average efficacy. Higher levels of efficacy in Catholic than in public schools are explained by organizational differences in schools.	High School and Beyond (N=8,488 teachers)
42	Leonard, L., & Leonard, P. (2003).	The most frequent forms of collaboration cited were department meetings, faculty meetings, special education meetings, subject area meetings, team teaching, lesson planning, and faculty workshops. The most frequent reason cited for not collaborating was a lack of time and a large amount of paperwork.	Self-collected (N=56)
43	Liu, X. S., & Meyer, J. P. (2005).	Student discipline problems were a major problem for teachers' dissatisfaction with their jobs. Minority teachers are less satisfied than their non-minority counterparts.	SASS/TFS (1994-95) N=6279 teachers
44	Liu, X. S., & Ramsey, J. (2008).	Teacher job satisfaction varied with gender, years of teaching and career status. Teacher compensation needs to be addressed separately from the issue of teacher satisfaction with work conditions because teacher satisfaction with compensation is not highly correlated with teacher satisfaction with work conditions.	SASS/TFS (2000-01) N=4952 teachers
45	Loeb, S., Darling-Hammond, L., & Luczak, J. (2005).	Teachers' ratings of school conditions were the strongest predictors of teacher turnover. Working conditions add substantive predictive power to the model and the addition of work conditions substantially reduces the effect of student demographics.	California teacher survey data linked to district data on salaries (N=1071 teachers in 1,018 schools)

Table A1 (cont'd)

No.	Author(s)/Year	Key Findings	Data Source/Sample Size
46	Locke, E. A. (1976)	This paper stresses a conceptual approach to job satisfaction and finds that mentally challenging work, working conditions compatible with an individual's needs, high self-esteem and the presence of agents in the workplace who can help the employee are among the conditions most conducive to satisfaction.	Review of existing literature
47	Lortie, D. (1975)	Lortie notes the phenomenon of teacher isolation and finds that teachers reject principals who exercise close supervision. 38% of teachers prefer to have supportive principals.	Content analysis of interviews of ES and HS teachers. Selection of teachers was random (N=94 teachers)
48	Ma, X., & MacMillan, R.B. (1999).	Teachers' positive perceptions of their administrators played a significant role in narrowing the teacher satisfaction gap among teachers with different experience.	Teacher data from the New Brunswick Elementary school study (N=2202 teachers)
49	Marks, H. M., & Printy, S. M. (2003).	These findings provide significant implications for educational policy aimed at retaining teachers in education.	School Restructuring Study (SRS); formal interviews with principals of the schools. N=24 schools; 144 core teachers
50	Michaelowa, K., & Wittmann, E. (2007).	Measures ensuring control and incentive related working conditions for teachers, significantly increase student achievement while reducing teacher job satisfaction. In addition, teachers' academic qualification beyond the "baccalaureate", while beneficial for students' learning, tends to lead to a mismatch between teachers' expectations and professional realities and thereby reduces teachers' job satisfaction. Class size has a considerable negative relationship with job satisfaction.	Program of Analysis of Education Systems (PASEC). N=100 schools in each of five countries
51	Moore, C. M. (2012).	School environment played a statistically significant role in the dissatisfaction of teachers. Specifically, teacher autonomy and principal leadership decreased the odds of teacher dissatisfaction, while student and community problems increased the odds of teacher dissatisfaction.	SASS (N=34,870 teachers and 6,800 schools)
52	Mowday, R. T., Steers, R.M., & Porter, L.M. (1979).	Relatively consistent relationships were found between the organizational commitment construct and employee turnover, absenteeism and job performance.	Self-collected (N=2563 employees in 9 divergent organizations)
53	Ostroff, C. (1992).	Results indicate that a relationship exists between satisfaction, performance, and attitudes. Organizations with more satisfied employees tended to be more effective than organizations with less satisfied employees.	NASSP surveys (N=364 schools in 36 states and 14,721 teachers)

Table A1 (cont'd)

No.	Author(s)/Year	Key Findings	Data Source/Sample Size
54	Perie, M., & Baker, D. P. (1997).	Favorable working conditions were associated with higher satisfaction scores. Demographic factors were not nearly as significant in explaining the different levels of satisfaction as workplace condition factors such as administrative support, parental involvement, and teacher control over classroom procedures. Teacher satisfaction showed a weak relationship with salary and benefits.	1993-94 SASS
55	Printy, S. M. (2008).	Results suggest that both principals and department chairpersons are instrumental in shaping opportunities for teachers to learn in communities of practice. Department chairpersons might serve to slow down the rate of instructional change	NELS:88 (N=2,718 teachers)
56	Pogodzinski, B., Youngs, P., Frank, K. A., Belman, D. (2012).	Perceptions regarding the relationships between the administrators and teachers are important. If teacher-administrator relations are poor, novices are less likely to stay in the school. Further, an individual teacher who perceives that she has adequate resources would be more willing to remain teaching.	Survey data (N=184 teachers across 99 schools)
57	Renzulli, L. A., Parrott, H. M. & Beattie, I. R. (2011).	Charter school teachers are more satisfied than public school teachers because of greater autonomy. They also have higher rates of attrition.. Teachers in racially mismatched schools have lower levels of satisfaction.	1999-2000 SASS data (N=32,930 teachers in 7,190 schools)
58	Rogers-Jenkinson, F., & Chapman, D.W. (1990).	The quality of school working conditions and respondents' relationships with other teachers were significantly related to teacher satisfaction for both public and private school teachers. Leadership style mattered for private school teachers.	Survey (N=190 public school teachers; N=100 private school teachers).
59	Rosenholtz, S. J., & Simpson, C. (1990).	Novice teachers' commitment is influenced more by organization supports while experienced teachers require more support for the core instructional tasks. Mid-career teachers have a lower commitment to their jobs and place a greater emphasis on autonomy in their jobs.	Self-collected (N=1213 teachers in 78 ES)
60	Sargent, T., & Hannum, E. (2005).	The least qualified teachers are consistently assigned to the poorest kids but these are also the most satisfied teachers in Gansu province.	Gansu Survey of Children and Families (GSCF) (N=128 principals and 1,003 teachers)

Table A1 (cont'd)

No.	Author(s)/Year	Key Findings	Data Source/Sample Size
61	Scafidi, B., Sjoquist, D. L., & Stinebrickner, T.R. (2005).	Teachers are more likely to leave schools with lower income and higher proportions of minorities.	Administrative data on Georgia schools (N=11070 elementary teachers)
62	Schneider, M. (2003).	Teachers reported dissatisfaction and daily problems with their school facilities. Over forty percent considered their classrooms to be inadequate to their needs. A third of teachers had no teacher workspace. Teachers believed that school conditions affected their career decisions.	Survey data in Chicago and Washington D.C. (N=N/A).
63	Scribner, J. P., Sawyer, R. K., Watson, S. T., & Myers, V. L. (2007).	The authors argue that the nature of purpose and autonomy within a teacher team can influence the social distribution of leadership.	Field notes /video recordings (N=2 HS teacher teams)
64	Shah, M., & Abualrob, M.A. (2012).	The findings of this study suggest that teachers' commitment to their profession could be enhanced by increasing collegiality among them.	Self-collected survey (N=17 schools and 364 teachers)
65	Shen, J., Leslie, J. M., Spybrook, J. K., Ma, X. (2012).	17% of the variance in teacher satisfaction is between schools implying that schools can make a difference in teacher job satisfaction. The authors found that school processes—particularly career and working conditions, staff collegiality, administrative support, and to a lesser extent, positive student behavior and teacher empowerment—are positively associated with teacher job satisfaction	SASS 2003-04 (N=7,670 principals and 40,770 teachers)
66	Skaalvik, E. M., & Skaalvik, S. (2011).	Teachers' feelings of belonging and emotional exhaustion were predictive of job satisfaction, while emotional exhaustion and job satisfaction were predictive of motivation to leave the teaching profession.	Self-collected data (N=2569 ES and MS teachers)
67	Somech, A. (2005).	Findings illustrate the limitation of using a directive approach in facilitating team innovation. However, directive leadership was related to school staff team performance directly and also indirectly through organizational commitment. On the other hand, participative leadership was linked to innovation indirectly through empowerment	Self-collected (N=140 elementary schools and 712 teachers)

Table A1 (cont'd)

No.	Author(s)/Year	Key Findings	Data Source/Sample Size
68	Spillane, J. P., Halverson, R., & Diamond, J. B. (2004).	They argue that leadership activity is constituted in the interaction of multiple leaders and followers around particular leadership tasks. Interdependency among leaders, followers, and the situation of leadership activity is critical.	NA
69	Stockard, J., & Lehman, M. B. (2004).	More satisfied teachers tended to be older, to work in more orderly schools, to have higher salaries, to receive more support from colleagues and parents, to have more control and influence over their work, and to perceive their principal as more effective. None of the other background, demographic, or assignment variables was significantly associated with teacher satisfaction.	1993-95 SASS; TFS; N=379 teachers responding to both surveys
70	Taylor, D., & Tashakkori, A. (1995).	Aspects of school climate emerged as stronger predictors of job satisfaction than did the elements of decision participation. Strongest among these school climate dimensions were the lack of obstacles to teaching and principal leadership.	1990 follow-up NELS (N=1296 schools and 9987 teachers)
71	Tschannen-Moran, M. (2001).	This study stresses the importance of trust in nurturing collaborative relationships. Schools where there was a high level of trust could be predicted to be schools where there would be a high level of collaboration.	Self-collected (N=50 teachers)
72	Wahlstrom, K.L., & Louis, K.S. (2008).	Teachers professional community (reflective dialogue, de-privatized practice, shared norms) have a robust effect on contemporary practice and these effects are only moderately changed with the introduction of individual characteristics.	Teacher survey developed for the national research project "Learning from Leadership" Wallace Foundation (N=4165 teachers in 138 schools)
73	Yasumoto, J. Y., Uekawa, K., & Bidwell, C. E. (2001).	When the math and science departments of the LSAY HS formed collegial foci, the effects of instructional practice on student achievement growth were intensified.	Data collected in collaboration with the Longitudinal Study of American Youth (LSAY). N=52 schools
74	Ylimaki, R., & Jacobson, S. (2013).	Successful principals distributed leadership in ways that cultivated OL, improved IL and supported CRP. They also believed in the importance of social and professional support from cohort models and similar networks.	Interviews with principals, teachers, staff, parents, students
75	Zembylas, M. & Papanastasiou, E. (2004).	People who did not have pressure from their family to follow this career, and who always wanted to become teachers were more likely to be satisfied with being teachers. Educators in higher positions (vice-principals or principals) tend to have higher levels of satisfaction than teachers.	Adapted version of the questionnaire developed by the "Teacher 2000 Project" (N=461 teachers/administrators)

Table A1 (cont'd)

No.	Author(s)/Year	Key Findings	Data Source/Sample Size
76	Zembylas, M. & Papanastasiou, E. (2005).	Status, promotion, decision-making, and personal growth all significantly affect the sense of empowerment felt by Cypriot teachers. Teachers who were very satisfied with their opportunities for promotion were found to have lower empowerment compared to the teachers who were not as satisfied with their opportunities for promotion.	Adapted version of the questionnaire developed by the "Teacher 2000 Project" (N=449 teachers)
77	Zembylas, M. & Papanastasiou, E. (2006).	Teacher satisfaction was associated with student interaction and collegial opportunity. Students' lack of interest and bad behavior, the centralized educational system, and the lack of professional autonomy were associated with teacher dissatisfaction.	52 semi-structured interviews with teachers/administrators

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CHAPTER 2

DOES LEADERSHIP STYLE MATTER? A MULTI-COUNTRY ANALYSIS OF PRINCIPAL LEADERSHIP AND TEACHERS' JOB SATISFACTION

2.1 Introduction

This paper explores how particular aspects of the workplace, specifically principals' leadership styles are associated with teacher satisfaction in a multi-country context inclusive of the United States and six Asian countries. Additionally, the data I use (TIMSS 2007) offer the unique opportunity to examine how teacher and principal perceptions of teacher satisfaction differ by country. Thus, both objective (principal reported) and subjective (teacher reported) measures of teacher satisfaction are available to me. Although some aspects of teacher policy such as teacher quality and teacher evaluation have received global attention, teacher satisfaction particularly in the Asian context has been much less discussed internationally.

The issue of teacher satisfaction merits further study because satisfaction in the literature (U.S.A) is related to productivity in the workplace and has direct implications not only for teacher turnover, but also for teacher commitment, and student achievement (Barnes, Crowe & Schaefer, 2007; Boyd, Grossman, Ing, Lankford, Loeb, Wyckoff, 2011; Guarino, Santibanez & Daley, 2006; Ingersoll, 2001; Ostroff, 1992; Stockard & Lehman, 2004; Perie & Baker). Previous research also links job satisfaction with job commitment (Firestone & Pennell, 1993; Mowday, Steers & Porter, 1979).

A focus on Asia in this analysis is motivated by the fact that there is a paucity of empirical research on teacher satisfaction in a multi-country context more generally and in a multi-country context within Asia specifically (See Table 2 in Chapter 1 of this dissertation). Further, the studies that are Asia-focused are mainly single-country studies within Asia. This

paucity of research that is Asia-focused is also corroborated by Hallinger (2011) who points out that less than nine percent of the papers published in the four top journals in Educational Administration in the year 2008-09 were on Asia.

Given that Asian economies are among the fastest growing economies in the world and that the importance of Asia as a region vis-à-vis the U.S. will most likely continue to grow over the next decade, a closer examination of leadership in Asian work environments as compared to the U.S. may help to inform school policies aimed at improving teacher-principal interactions within the U.S.

2.2. Literature Review

2.2.1 Leadership & Satisfaction

This section reviews relevant literature on instructional and transformational leadership with respect to teacher satisfaction. The principal is often considered a central figure in any discussion of the school as a workplace. This may be because leadership behavior can create distinct working environments within schools, which in turn impact teacher efficacy and sense of well-being. In fact, scholars such as Stockard and Lehman (2004) and Grissom (2011) found that leadership is one of the most salient dimensions of work conditions with respect to both teacher satisfaction and teacher turnover. Several other studies support similar results within the U.S. (Branch et al, 2013; Grissom & Loeb, 2011; Hulpia, Devos & Rosseel, 2009; Lee, Dedrick & Smith, 1991; Moore, 2012; Pogodzinski et al, 2012; Printy, 2008; Rosenholtz, 1990; Scribner et al, 2007; Taylor & Tashakkori, 1995; Wahlstrom & Louis, 2008). Further support for leadership efficacy comes from Allensworth et al (2009) who found that teachers preferred schools where they felt they had supportive principals who helped them do their job better. Similarly, Brown and Wynn (2009) found that principals effective at improving teacher

satisfaction and reducing turnover provide the conditions and resources necessary to support teachers.

Although a variety of leadership models have been employed in leadership research over the past twenty-five years, two conceptual models – transformational leadership and instructional leadership have come to dominate the field of educational leadership. These models focus explicitly on the manner in which leadership exercised by school administrators and teachers brings about improved educational outcomes (Hallinger, 2003).

2.2.2 Instructional Leadership

The term 'instructional leadership' originated with the 'effective schools movement' in the 1970's when researchers started to compare characteristics of schools that were "effective" (i.e. successful at educating all students regardless of their family background) to schools that were not so effective. Key among the list of characteristics that emerged from this movement with respect to effective schools was the principal's role as an instructional leader. The aims of instructional leadership are typically tied to the core work of schools – teaching and learning. Instructional leaders are viewed in the literature as culture builders who create an academic press focusing on student academic outcomes.

The most frequently used conceptualization of instructional leadership was developed by Hallinger (2000). This model proposes three key dimensions of the instructional leadership construct. These include defining the school's mission (framing and communicating goals), managing the instructional program (supervising instruction, coordinating curriculum, and monitoring student progress) and promoting a positive learning climate in schools (protecting instructional time, professional development, a visible presence, promoting high expectations and providing incentives for teachers and students).

A vast body of extant research on instructional leadership indicates that school principals contribute to student achievement indirectly (Heck et al, 1990; Lee, Walker & Chui, 2012; Leithwood & Day, 2008; Robinson, Lloyd & Rowe, 2008). Further, school context attributes such as socioeconomic status and school size do have an effect on the type of instructional leadership exercised by principals (Hallinger & Heck, 1996; Hallinger & Heck, 2002). Relatively few studies find a direct relationship between the principal's hands-on supervision of classroom instruction, teacher effectiveness and student achievement (see Hallinger & Heck, 1996 for one such study). Recent research on instructional leadership has begun to focus on the interaction between leaders, between leaders and their followers and the particular contexts they work in (Neumerski, 2013).

2.2.3 Transformational Leadership

While the persisting influence of the instructional leadership role of principals must be acknowledged, principals undeniably play multi-faceted roles within schools that extend beyond direct supervision of curriculum and instruction. In the 1990's in response to a broad dissatisfaction with the instructional leadership model, which many believed focused too narrowly on the principal as the center of expertise and authority a new leadership paradigm emerged known as transformational leadership. Transformational leaders focus on fostering the organization's capacity to innovate and on supporting the development of changes to teaching and learning practices. In this sense, transformational leaders seek to generate *second-order effects* (Hallinger, 2003) or to create conditions under which others become committed to school improvement without direction from above. Transformational leadership may also be considered distributive to the extent that it prioritizes developing a shared vision and a shared commitment to school change.

Transformational leadership was first elucidated as a theory in the general management literature. In the early nineties, Bass and Avolio developed and popularized the conceptualization of the 4 I's – *Idealized influence, Inspirational motivation, Intellectual stimulation and Individualized consideration*. Leithwood and his colleagues subsequently substantively adapted Bass's transformational leadership construct to the field of education. Notably, the transformational leadership model does not assume that the principal alone will provide the leadership that creates conditions suitable for school change. On the contrary, the model allows for leadership to be shared with teachers. By prioritizing the needs of individual staff members, the model displays a more bottom-up approach to influencing people within the organization. Considerable research has been conducted over the last two decades using the transformational leadership model (Bogler, 2001; Hallinger & Heck, 1996; Leithwood & Jantzi, 2000; Marks & Printy, 2003; Silins, 1994). Key understandings that emerged from this research include the importance of developing human resources within the organization. Thus, transformational leadership emphasizes promoting change in people rather than change in specific instructional practices. This body of research points to the strong direct effect of transformational leadership on school and classroom conditions. Some studies also put forth the view that transformational leadership has an impact on teacher perceptions of school conditions and their commitment to change (Bogler, 2001).

2.2.4 International Literature on Leadership

Internationally, there is a broad set of leadership studies in countries like Hong Kong, China, and Taiwan (Cheng & Wong, 1996; Cheong, 2000; Lee, Pan & Chen, 2011; Lee, Walker & Chui, 2012; Walker, Hu & Qian, 2012) within the geographic regions of East and South-East Asia. Interest in these countries is increasingly driven by the need to gain a deeper

understanding of what type of leadership works there and also how it works. Most recently, Walker, Hu and Qian (2012) reviewed the literature on Chinese principalship in both English and Chinese between 1998 and 2008. In doing so, they offer a number of insights into the role of Chinese principals. The core patterns they identified from their review include imported frameworks, indigenous investigations and contextual influences. Their paper highlights that Chinese principals display transformational practices very similar to those described in the imported frameworks such as inspiration, charismatic leadership and intellectual stimulation. Similarly, Pan and Chen's study (2011) highlights how decentralization reform in Taiwan in the 1990's has created the need for a more participatory education system that emphasizes instructional, curriculum and transformative styles of leadership as qualities necessary for principals to fulfil educational reform mandates. Lee, Walker and Chui's (2012) study in Hong Kong found that instructional leadership that focuses on managing instruction boosts the positive effect of school attachment on student learning. However, the direct supervision of instruction undermined student achievement through school attachment.

Additionally, recent work by Hallinger(2011) and Hallinger and Huber(2012) seeks to expand the empirical knowledge base that currently exists in the East Asia region and also explores policy trends for school leadership in East Asia. These studies show that much work still remains to be done in the region as a broad consensus regarding the specifics of leadership that matter based on empirical research is yet to emerge.

In spite of this vast body of literature on school leadership both within the U.S.A. and internationally, leadership studies that specifically focus on teacher satisfaction in the international context are concentrated in a handful of countries like Israel (Abu-Saad & Hendrix, 1995; Bogler, 2001), Singapore (Koh et al, 1995); Flanders (Hulpia et al, 2009) and Australia

(Dinham, 2005; Dinham 2002). Additionally, these studies mostly examine one particular leadership style in a single country analysis. Missing from this body of work is a comprehensive multi-country analysis of the leadership-satisfaction association that will further explicate and clarify this relationship in a wider Asian context.

2.3 Conceptual & Theoretical Framework

In this study, I seek to understand how leadership style in schools - transactional, transformational and instructional is associated with teacher satisfaction and whether the positive relationship between transformational leadership and teacher satisfaction is observed in countries in Asia as well as the U.S.A.

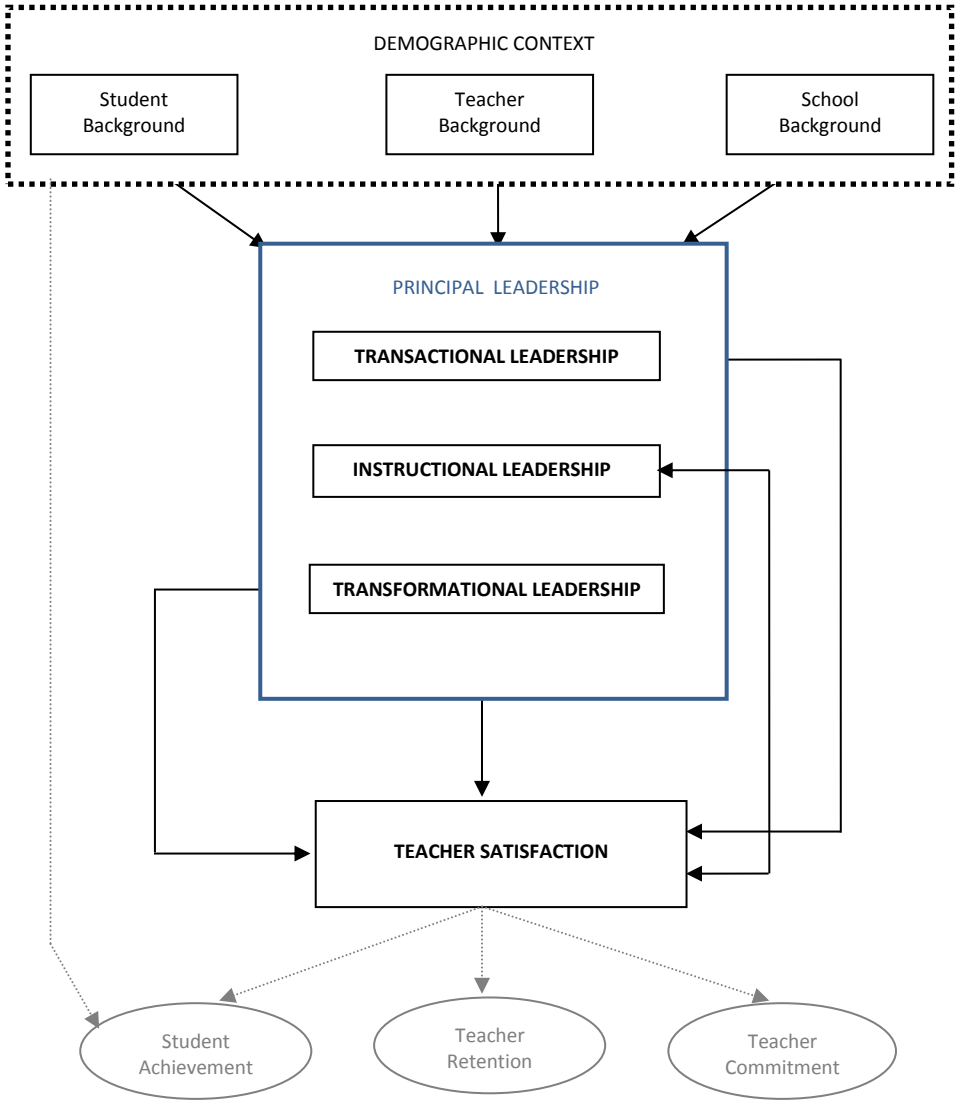
In order to more fully explore the relationship between leadership and satisfaction in a multi-country context, I use the 'full range of leadership' model proposed by Bass and Avolio (1994) as my theoretical framework in this paper. The full range of leadership model developed by Bass and Avolio (1994) includes transactional leadership as well as transformational leadership as two ends of a leadership continuum. Thus, transactional leadership is not necessarily a leadership style that is considered distinct from transformational leadership. Rather, it has been treated in the leadership literature as a form of leadership which is situated at one extreme of transformational leadership spectrum. Transactional leadership is a term used by Bass and Avolio to characterize leadership that emphasizes an exchange i.e. the leader specifies what needs to be done and rewards colleagues when those requirements are adequately fulfilled. They term this 'contingent reward.' A second aspect of transactional leadership is what Bass and Avolio refer to as 'management by exception.'

Transformational leaders however go beyond this simple transaction in the workplace to inspire and motivate followers, act as role models, generate a vision or mission of the

organization and develop higher levels of ability and work ethic among colleagues. Interestingly, Hallinger's (2005) often used definition of instructional leadership which encompasses three leadership dimensions - defining the school's mission, managing the instructional program, and promoting a positive learning climate overlaps to a degree with transformational leadership. While acknowledging that instructional and transformational leadership may overlap as do transactional and transformational leadership I nevertheless treat each of these leadership styles as distinct in order to keep the empirical analysis clean and to avoid potential issues of multicollinearity that would arise if the leadership styles were allowed to overlap in the analytic models. To this end, instructional leadership in the analysis is measured by a single variable - the percent of time that the principal spent on instructional leadership in the previous year.

Figure 2 provides a conceptual road map for the analysis proposed. Teacher satisfaction[8] is the binary outcome of interest. I use an extensive set of student background, teacher demographic and school controls known to be associated with teacher satisfaction in the literature. These controls include variables like teacher age, experience, gender, certification, school size, class size, school infrastructure and proxies for socioeconomic status aggregated to the school level. These controls represent the demographic context of schools within which teachers teach. The key independent variables are in the box labeled 'Principal Leadership.' Figure 2 (see next page) indicates that teacher satisfaction is an antecedent of outcomes such as

[8] For analysis I the dependent variable is a teacher level variable which represents teacher perception of the level of teacher satisfaction. For analysis II, the dependent variable (teacher reported satisfaction) is aggregated at the school level. For analysis III, the dependent variable is principal perception of teacher satisfaction.



Source: Author conceptualization of the interrelationship between satisfaction and principal leadership style.

Figure 2: A Conceptual Model of Principal Leadership and Teachers' Job Satisfaction

teacher commitment, teacher turnover and student achievement. These outcomes are depicted in gray font to emphasize that these relationships are outside the scope of this analysis. Instead, the key emphasis is on leadership style.

The remainder of the paper is organized as follows. Section 2.4 of the paper provides country background information to better contextualize the results of the within country regressions on leadership and teacher satisfaction. Section 2.5 outlines the research questions of interest. Section 2.6 of the paper describes the data. Section 2.7 outlines the models and method used. Section 2.8 provides a summary of results. Section 2.9 provides a discussion of findings. Section 2.10 provides a detailed contextual explanation of the results for a selected country. Section 2.11 concludes with the limitations of this study.

2.4. Country Context

The following section provides a brief overview of the location, historical background, and national education system within each of the countries analyzed. The purpose of this section is to help the reader contextualize the results of the within country regressions in the sections to follow.

The countries analyzed were selected to provide a broad representation of the different regions within Asia in order to capitalize on the rich regional and cultural variation within Asia. Accordingly, of the six countries selected, two are located in East Asia, three are located in South-East Asia and one is in North Asia. There are interesting overlaps in terms of similarities and differences between these countries. For example, almost all these countries are moving or have officially made the move from highly centralized school systems to a more decentralized mode of operation. On the other hand, there are distinct cultural differences among the selected countries. Two of the countries (Hong Kong and Taiwan) are heavily influenced by

Confucianism, two (Indonesia, and Malaysia) are predominantly Islamic and in Mongolia a huge percentage of the population (40 percent) does not practice any religion.

2.4.1 Hong Kong (SAR)

2.4.11 Location: East Asia

2.4.12 Historical Background: Hong Kong was designated as a Special Administrative Region (SAR) of the People's Republic of China in 1997 based on an agreement between the UK and China. The understanding reached with the creation of the SAR was that Hong Kong would enjoy a high degree of autonomy in all matters with the exception of foreign and defense affairs for the next fifty years. Ethnically, Hong Kong primarily consists of a Chinese population. The ethnic breakup is as follows: Chinese 93.6%, Filipino 1.9%, Indonesian 1.9%, other 2.6% (U.S. Central Intelligence Agency, 2011 census)[9]. The official language is Cantonese, which is spoken by 89.5% of the population followed by English, which is spoken by 3.5% of the population (U.S. Central Intelligence Agency, 2011 census). The population of Hong Kong is entirely urban.

2.4.13 Education System: Educational expenditure in Hong Kong constitutes 3.4% of GDP (U.S. Central Intelligence Agency, 2013). Traditionally, decision-making in Hong Kong is concentrated in the hands of senior management. The current system is, however, moving towards devolution of authority and school-based management (SBM) (Hui & Cheung, 2006). The majority of secondary schools are homogenous in terms of salary structure, professional qualification of teachers and principals, promotion, student-teacher ratio, facilities, curriculum and examination structure, and supervision by the Education Department (Cheong, 2000).

[9] All historical background statistics for countries taken from https://www.cia.gov/library/publications/the-world-factbook/geos/hk.html unless otherwise indicated.

The Hong Kong Institute of Education (HKIEd) under the aegis of the University Grants Commission (UGC) is primarily responsible for teacher preparation. It offers a range of degree and postgraduate programs for pre-service and in-service teachers. Principals need to have five years of teaching experience before they can earn certification for a principalship. The school system in Hong Kong is still primarily driven by public examinations. Consequently, school principals are quite concerned with academic achievement and curricular completion (Cheong, 2000).

Two areas of difficulty for principals in Hong Kong are providing incentives for teachers and encouraging decisional participation (Cheong, 2000). This is because the salary structure for teachers in Hong Kong is fairly rigid and there are few opportunities available for promotion. The principal therefore has little discretion to reward teachers.

2.4.2 Indonesia

2.4.21 Location: South-east Asia

2.4.22 Historical Background: Indonesia was originally a Dutch colony in the 17th Century. Around 1949, Netherlands ceded control of Indonesia. Subsequently, after four decades of authoritarianism, Indonesia became the world's third most populous democracy and the world's largest Muslim majority nation. Ethnically, the Javanese constitute 40.6% of the population, Sundanese 15%, Madurese 3.3%, Minangkabau 2.7%, Betawi 2.4%, Bugis 2.4%, Banten 2%, Banjar 1.7%, other or unspecified 29.9% (U.S. Central Intelligence Agency, 2000 census). The official language in the country is Bahasa Indonesia (official, modified form of Malay). English, Dutch, and local dialects are also spoken. Around 86.1% of the population is Muslim. 50.7% of the total population is urban (U.S. Central Intelligence Agency, 2013). Major urban areas include Jakarta, which is the capital, Surabaya, Bandung, Medan, and Semarang.

2.4.23 Education System:[10]Educational expenditure in Indonesia constitutes approximately 3% of the GDP (U.S. Central Intelligence Agency, 2013). Prior to 1999, the Indonesia education system was highly centralized. Most course content, authorization of textbooks, teaching hours and other matters associated with public school governance were centrally determined (Hariri, Monypenny & Prideaux, 2012). As such, teachers did not enjoy much autonomy with respect to curriculum design and teaching methods. Since that time, districts have become important units in education development because of the move to empower local communities through the Education Council at the district level.

In 2001, school-based management (SBM) was introduced nationally. Since then the managerial and financial authority for public schools has been delegated to the district level. In 2003, Indonesia began to experience a fundamental restructuring in education because of the enactment of the National Education System Law Number 20. A significant implication of this reform was the greater autonomy accorded to local governments and schools. Specifically, school principals came to be regarded as change agents expected to exercise their authority to build capacity for reform in their schools and to improve student performance. According to Sofo, Fitzgerald and Jawas (2012), however, many Indonesian principals are somewhat uncertain about how to use this new authority. Further, the protection and freedom necessary for teachers to be creative and to develop their teaching competencies is still not well-entrenched although under SBM the expectation is that the teachers will play a critical role in designing curricula that best meets local needs and conditions. Thus, teacher empowerment as a concept is still nascent in Indonesia.

[10] Source for data for the education system in Indonesia: Hariri, Monypenny & Prideaux (2012).

2.4.3. Malaysia

2.4.31 Location: South-east Asia

2.4.32 Historical Background: Malaysia was a British colony in the 18th and 19th centuries. It gained independence in 1957. Politically, the country is a parliamentary democracy. The ethnic breakup in Malaysia is as follows: Malay 50.4%, Chinese 23.7%, indigenous 11%, Indian 7.1%, others 7.8% (2004). The official language in the country is Bahasa Malaysia. English, Chinese (Cantonese, Mandarin, Hokkien, Hakka, Hainan, Foochow), Tamil, Telugu, Malayalam, Punjabi, and Thai are also spoken. Around 60.4% of the population is Muslim. 72.8% of total population (U.S. Central Intelligence Agency, 2013) is urban. Major urban areas include Kuala Lumpur (which is also the capital), Klang, and Johor Bahru.

2.4.33 Education System[11]: Education Expenditure in Malaysia is higher than in Hong Kong and Indonesia. It constitutes 5.1% of GDP (U.S. Central Intelligence Agency, 2013) and reflects the importance attached to education by the national government. The main objectives of education in Malaysia are national integration and national development. There is a strong perception that education is critical for human resource development and to meet the needs of the growing economy. The role of education in instilling positive values is also considered very important. The internationalization of Malaysian thinking about teaching and learning is evident by the introduction of several innovations such as collaborative/team teaching, peer evaluation, and self-reflection (Schwille et al, 2013).

Teacher education takes place at both public and private universities as well as teacher education institutes. All future teachers are required to pass comprehensive examinations (oral and written), the Malaysia Teacher Education and the Malaysian Educators Selection Inventory. Continuous assessment is also required within courses (Schwille et al, 2013). The Teacher

[11] Source for information on the Education system in Malaysia: Schwille et al (2013).

Education Department of the MOE is the body that sets curriculum for the teacher education institutes. The MOE also determines the number of teaching posts available by subject-matter for each year, based on the demand for teachers in those disciplines in schools nationwide. Public school teachers are initially appointed as probationary education officers by the Education Service Commission. After a probationary period of three years the appointment is renewed based on the teacher's annual performance report prepared by the principal. Once confirmed, teachers are treated as permanent staff until they retire at the age of 58 (Schwille et al, 2013).

The teaching profession in Malaysia has come to be regarded more favorably of late for two reasons. One is the economic slowdown and the second reason is that teaching in public schools is considered a government job complete with all the perks that other government servants enjoy, including job-security. In terms of social status, teachers are now perceived to be a professional group, like doctors, who are highly respected by society (Schwille et al, 2013).

2.4.4. Mongolia

2.4.41 Location: North Asia

2.4.42 Historical Background: Mongolia was ruled by the Chinese in the late 17th century. Mongolia won its independence in 1921 when a communist regime was instated. The Mongolian People's Revolutionary Party (MPRP) won elections in 1990 and 1992, but was defeated by the Democratic Union Coalition (DUC) in the 1996 parliamentary election. A coalition of four political parties led by the Democratic Party gained control of the Parliament in the 2012 election. The ethnic breakdown of the population is as follows: Mongol (mostly Khalkha) 94.9%, Turkic (mostly Kazakh) 5%, other (including Chinese and Russian) 0.1% (2000). The official language spoken by 90% of the population is Khalkha Mongol. In addition, there is some Turkic and Russian. Around 50% of the population practices Buddhism, 6%

practice Christianity, 4% practice Islam and around 40% do not practice any religion. Around 68% of the total population (U.S. Central Intelligence Agency, 2013) is urban. Ulaanbatar, which is also the capital, is a major urban area.

2.4.43 Education System: Education Expenditure in Mongolia is around 5.5% of GDP (U.S. Central Intelligence Agency, 2013). Since the 1990's the Ministry of Education in Mongolia has periodically changed from centralization to decentralized policy and back to recentralization (Steiner-Khamsi & Stolpe, 2004). According to Steiner-Khamsi and Stolpe (2004), borrowing education reform models from elsewhere is widely prevalent in Mongolia (Steiner-Khamsi & Stolpe, 2004).

The central education authority in Mongolia is the Ministry of Education, Culture, and Science. The Ministry is responsible for supervising virtually all publicly funded education. It provides guidance and financial assistance for the operation of local public and private educational institutions. The Ministry is headed by a Minister who is part of the Prime Minister's Cabinet. Provincial governments are responsible for implementing the nation-wide education policy at the provincial and district levels.

Teacher education is provided at the State Pedagogical University, higher schools and teacher training colleges. Primary and Secondary education teachers are recruited by the principals of the schools where they wish to teach. Teacher salaries are determined by the salary scheme for governmental service servants and are approved by the government. In addition to their base salary, teachers get bonuses based on performance. Elementary school teachers are typically female.

2.4.5. Taiwan

2.4.51 Location: East Asia

2.4.52 Historical Background: In 1946, Taiwan was ruled by a government controlled under a single-party, Kuomintang of China (translated as the Chinese Nationalist Party). This government was called the KMT government. By the 1950s, the ruling authorities gradually began to democratize and in the year 2000, Taiwan underwent its first peaceful transfer of power from the Nationalist to the Democratic Progressive Party. Ethnically, 84% of the population is Taiwanese (including Hakka), 14% is mainland Chinese and 2% is indigenous. The official language of Taiwan is Mandarin Chinese. The bulk of the population practices a mixture of Buddhism and Taoism. The remainder of the population (4.5%) is Christian (U.S. Central Intelligence Agency, 2013).

2.4.53 Education System: The teacher education system in Taiwan is highly competitive and driven by national policy. As a result, teacher candidates face rigorous evaluation throughout the teacher preparation process. Teacher training requirements are fairly rigorous and culminate in a national test which is part of the quality control of pre-service teacher education. Until recently, the government exercised fairly tight control over institutions of teacher education as well as the deployment of novice teachers (Schwille et al, 2013). In the early 1990's, rigid control over teacher education was relaxed. Teachers now have to compete for specific vacancies. In short, Taiwan has now moved toward a "position-based as opposed to career-based teacher employment." (Schwille et al, 2013).

Teaching in Taiwan is a very well-respected profession "infused with dignity and authority." (Schwille et al, 2013). Teachers in Taiwan thus, typically enjoy favorable work conditions and incentives. All remuneration for public school teachers is government funded and ensured. The high status accorded to teachers in Taiwan may be attributed to the prestige and status associated with teaching in traditional Chinese culture. The role of teachers in Taiwan

goes beyond merely imparting subject matter knowledge. Teachers are also expected to support the personal and social development of students and to foster good behavior. Thus, teachers play a role similar to that of parents in terms of providing personal guidance and acting as role models for the children.

2.4.6 Thailand

2.4.61 Location: South-east Asia

2.4.62 Historical Background: Thailand is the only Southeast Asian country never to have been colonized by a European power. In 1932, a revolution led to the establishment of a constitutional monarchy in Thailand. Since 2005, Thailand has experienced severe political turmoil including a military coup in 2006 that ousted then Prime Minister Thaksin Chinnawat. In 2011, Thaksin's youngest sister Yinglak Chinnawat and the Puea Thai Party assumed control of the government. Ethnically, 75% of the population is Thai, 14% is Chinese and 11% are other ethnicities. The official language is Thai with English being the secondary language of the elite. Buddhism is the official religion in Thailand with 94.6% of the population practicing it. In addition, 4.6% practice Islam (U.S. Central Intelligence Agency, 2013). 34.1% of total population is urban (U.S. Central Intelligence Agency, 2013) with Bangkok being both a major urban area and the capital of Thailand.

2.4.63 Education System: Educational expenditure in Thailand constitutes 3.8% of the GDP (U.S. Central Intelligence Agency, 2013). Basic education in Thailand is the responsibility of the Ministry of Education. Thai education reform was precipitated by the Asian economic crisis in 1997. This crisis led to a drafting of a new Thai constitution which called for education reform and decentralization of power. The rationale for the 1999 reform stemmed from the desire to improve the country's competitiveness vis-a-vis other Asian countries such as China,

India, Vietnam, Malaysia, and Singapore. The Thai system of centralized governance and management was deemed to be poor. Economically, an important reason for reform was the high level of income inequality, with a Gini Coefficient of 5.21 (Schwille et al, 2013).

Teaching is not as attractive as other occupations in Thailand for highly educated persons. This is reflected in the fact that academically qualified students with high achievement are not interested in becoming teachers. Students prefer fields such as business, finance, engineering and medical science on account of the higher income and job availability associated with these fields. In addition, teacher bonuses and incentives are not well-instituted. The majority of teachers receive their customary one-tier salary increase, irrespective of their teaching performance.

The Teachers' Council of Thailand is responsible for accrediting degrees and certificates. Universities with a faculty of education are responsible for the preparation of future teachers for both primary and secondary schools. In contrast to the U.S.A, there is no differentiation in the preparation of teachers for the lower grades and secondary grades up to grade 12 (Schwille et al, 2013). Prospective teachers need to complete a five-year Bachelor's degree in education majoring in mathematics or complete four years of a Bachelor of Science with one year for a graduate diploma in the teaching profession. After gaining these degrees, they can teach mathematics in schools from Grades 1 to 12.

2.4.7. U.S.A.

2.4.71 Location: North America

2.4.72 Historical Background: In 1776, Britain's American colonies were recognized as the new nation of the United States of America. During the 19th and 20th centuries, thirty-seven new states were added to the original thirteen as the nation expanded. Since the end of World War II, the economy has achieved relatively steady growth, low unemployment and inflation,

and rapid advances in technology. Ethnically, the USA is 79.96% white, 12.85% black, 4.43% Asian, 0.97% Amerindian and Alaska native, and 0.18% native Hawaiian and other Pacific islander(U.S. Central Intelligence Agency, 2013). The USA has no official national language though the bulk of the population speaks English (82.1%) with 10.7% speaking Spanish (U.S. Central Intelligence Agency, 2013). Major religions include: Protestant 51.3%, Roman Catholic 23.9%, Mormon 1.7%, other Christian 1.6%, Jewish 1.7%, Buddhist 0.7%, Muslim 0.6%, other or unspecified 2.5%, unaffiliated 12.1%, none 4%. 82% of total population as of 2010 was urban (U.S. Central Intelligence Agency, 2013). Major urban areas include New York-Newark, Los Angeles, Miami, and Washington, D.C.

2.4.73 Education System: Education expenditure constitutes approximately 5.4% of the GDP in the USA (U.S. Central Intelligence Agency, 2013). Teaching is regarded as a "position-based occupation" or one in which school districts compete for teachers. Teacher recruitment and hiring practices vary widely in the USA. However, most school districts have regulated career progression. Common criteria that are met by teaching applicants across a majority of public school districts in the U. S. include full standard state licensure in the field (77%), graduation from a state-approved teacher preparation program (66% of districts) and a passing score on a state test of basic skills (64% of districts) (Schwille et al, 2013).

With respect to teacher training, the U.S.A has gradually shifted from local control toward a centralization of teacher certification policy at the state level. There is still, however, considerable variation within and across states in licensure and program accreditation requirements for primary school and lower secondary mathematics teaching. In the USA, more than 1,300 public and private colleges and universities as well as school districts, state agencies, and private organizations offer teacher education for future primary and secondary teachers

(Schwille et al, 2013). State approval is mandatory for teacher education programs though approval standards vary across states.

Virtually all public school districts in the U. S. (93%) have a teacher salary schedule. The average yearly base salary for a beginning public school teacher with a bachelor's degree is not comparable with salaries for graduates with jobs in engineering, computer science, health, or business. Moreover, teachers' working conditions vary greatly. Some teachers, particularly those in high-poverty and/or low-resource schools, face issues such as large classes, lack of instructional materials, limited access to technology, long work hours, long commutes, and remote locations. Previous research has shown that poor working conditions are associated with high levels of teacher turnover.

The country discussion shows that while the countries chosen for analysis have made the move from more centralized to less centralized systems, there are distinct cultural and geographic differences between them which allow us to capitalize on the rich cultural and regional variation within Asia. For instance, teaching as a profession in Taiwan is highly respected as compared to Thailand where it is not the first choice of many graduating students. Similarly, teacher education is highly competitive in Taiwan (where performance is closely linked to teacher evaluations) compared to Thailand where teachers get their customary salary increases regardless of their performance.

The following sections - Section 2.5 and 2.6 address the guiding questions for this analysis and a discussion of the data used respectively.

2.5 Research Questions

The main research questions of interest in this study are as follows:

1. What aspects of a principal's leadership style (transactional, transformational and instructional) are associated with teacher satisfaction in a multi-country context?
   i) Is the direction of the association between these leadership indices (transactional, transformational and instructional) and teacher satisfaction similar across the six countries in Asia and the U.S.?
   ii) Are the leadership dimensions significantly associated with teacher satisfaction consistent across all countries?
2. Does the observed relationship between principal leadership style and teachers' job satisfaction vary when the outcome variable (teacher satisfaction) is principal reported rather than teacher reported?

2.6 Data

2.6.1 Sample Design & Weights

I use the Trends in International Math and Science Study (TIMSS) 2007 data for this analysis. TIMSS 2007 are cross-sectional data collected by the International Association for the Evaluation of Educational Achievement (IEA). I analyze teacher satisfaction for grade 8 math and science teachers[12] in six Asian countries participating in TIMSS 2007, as well as the United States. The countries represented in the analysis are Hong Kong (SAR), Indonesia, Malaysia, Mongolia, Taipei (Taiwan) & Thailand. For this subset of countries data on approximately 120 schools and 300 teachers are available in each country[13].

The TIMSS 2007 data are particularly well-suited to cross-national analysis first, because they collect a rich array of student, school and teacher variables across different educational, organizational and curricular systems (Foy & Olson, 2009). Second, the IEA takes care to

[12] Math and Science teacher satisfaction is analyzed because of data availability for these subjects.
[13] The exact number of students, teachers, and schools varies by country.

ensure a high level of comparability/reliability of the instruments across countries. TIMSS uses a two-stage sampling procedure where a probability proportional-to-size sample of schools is selected at the first sampling stage and one or two intact classrooms (8^{th} grade) are sampled per school with an equal probability of selection at the second stage (Joncas, 2008a). The TIMSS schools are thus a nationally representative sample of schools within each country though the teachers are not nationally representative. They are instead the teachers of a nationally representative sample of students. Consequently, the teacher weight variable specified in TIMSS is not suitable for teacher level analysis. It is instead designed for using teacher background data in student level analyses. Analysis I (a detailed description of all analyses is provided in section 2.7), which is at the teacher level is therefore presented without weighting the results. Several other sampling and weighting variables are included in the TIMSS data files to address the complex sampling structure of the data (Joncas, 2008b). I use schwgt for Analysis 2 and 3, which is the recommended probability weight for school level analysis using TIMSS data. In this study, the data are not combined into a single cross-national dataset. Instead, I run separate within country regressions. This has the advantage of obviating the need to control adequately for country context and culture within the regression (which would be necessary in a pooled cross-national comparison) as it is based on the assumption that culture will not differ substantively between schools within the same country.

2.6.2. Description of Dependent Variables

A summary of descriptive statistics on all the variables used in the analysis is provided in Table 1. The dependent variable for the first research question (Analysis I – teacher level) is a measure of teacher perception of teacher satisfaction at the teacher level. It is a binary response variable constructed from a categorical variable such that 1=very high/high satisfaction and

0=medium/ low satisfaction. For the same research question I conduct another analysis at the school level because schools in the TIMSS data are nationally representative while teachers are not. The dependent variable for Analysis II – (School level) is a measure of teacher satisfaction aggregated at the school level. The dependent variable for the second research question (Analysis III – School level) is a measure of principal perception of teacher satisfaction. This is constructed in a similar manner to the teacher reported measure of satisfaction.

2.6.3. Description of Key Independent Variables

The primary independent variables of interest in all analyses are the leadership variables measuring transactional and instructional leadership and the factor scores measuring transformational leadership. Leithwood and Sun (2012) in their research indicate that two leadership practices – *contingent reward* and *management by exception* may be classified as traditional approaches to leadership in their own right. Bass and Avolio (1993) refer to these leadership practices as "transactional leadership." In this analysis, a binary variable that asks the principal whether incentives are used to recruit or retain teachers in their school (tch_incentives) was used as a measure of the leadership practice of *contingent reward*. Under *management by exception*, the leader monitors the performance of staff members and steps in when their behavior deviates from expectation. In this analysis, a binary variable that measures whether observations by the principal are used to evaluate 8th grade teachers (prinobs) reflects the leadership practice of *management by exception*.

I conducted an exploratory factor analysis (with varimax rotation) to develop an index of transformational leadership. Factors with an eigenvalue of 1 or higher were retained based on

Table 3: Components of Leadership Indices [14]

No.	Leadership Type	Variable Name	Variable description
		Transactional Leadership	
1.	Management by Exception	prinobs	Are observations by the principal/senior staff used to evaluate 8th grade math teacher practice?
2.	Contingent Reward	tch_incent	Are incentives in the form of a bonus, housing, pay, or small classes used to retain 8th grade math teachers?
		Transformational Leadership	
	Setting Directions		
1.	Inspirational Motivation	hightch_goals	How would you characterize teachers' understanding of school curricular goals?
2.	Hold High Performance Expectations	enrichment	Does school offer enrichment math for 8th grade math students?
		high_tchexp	How would you characterize teachers' expectations for student performance?
		tch_currsuccess	How would you characterize Teachers degree of success in implementing school's curriculum
	Developing People		
3.	Provide Individual Support/Intellectual stimulation	high_pdschimp	In past 2 years what percent of your math teachers have been involved in PD for math targeted at supporting the school's own improvement goals?
		pd_tchg	PD targeted at improving teaching skills
		pd_tech	PD targeted at using information technology for educational purposes
	Re-designing the Organization		
4.	School Discipline	high_stuattend	Recoded index of good school attendance
		low_cldist	How often does classroom disturbance occur for 8th grade students in your school?
5.	Building Collaborative Structures	peerreview	Is teacher peer review used to evaluate practice of teachers?
		coll_concept	How often do you have discussions about how to teach a particular concept with other teachers?
		obscoll	How often do you have informal observations of your classroom by another teacher?
6.	Community Focus	fundraise	Does your school ask parents to raise funds for school?
		volunteer	Does your school ask parents to volunteer for school projects and trips?
		hwcomplete	Does your school ask parents to ensure their child completes his/her hw?
		schcomm	Does your school ask parents to serve on school committees (e.g. Select school personnel, review school finances)
		events	Does school ask parents to attend special events

[14] The variables listed under transformational leadership were used in an Exploratory Factor Analysis (EFA) to create an index of transformational leadership. All variables for EFA were selected based on Leithwood and Sun's (2012) conceptualization of transformational leadership.

Table 3 (cont'd)

	Instructional Leadership	
1.	BC4GAPIL	By the end of this school year approximately what percentage of time in your role as principal will you have spent on instructional leadership?

the Kaiser criterion. In all countries the variables loaded on to at least two dimensions of transformational leadership using this criterion. Additionally, because for almost all the countries (except Mongolia) the variables loading on the community focus dimension of leadership had factor loadings of .30 or higher they were included even if the eigenvalue for this third factor was below 1. Table 4 thus reports the factor loadings above .30 for all three leadership factors across all seven countries. Regression factor scores were then computed for these transformational leadership factors using STATA's 'predict' command. These leadership factors were operationalized as 'Setting Directions,' 'Developing People, and 'Community Focus' in keeping with Leithwood's model of transformational leadership based on the Nature of School Leadership survey (NSL) (See Leithwood, Aitken & Jantzi, 2001 in Leithwood & Sun, 2012).

Table 3 provides a detailed list of the variables that were used in the exploratory factor analysis to create the transformational leadership factor scores. The dimension '*Setting Directions*' references the leader's role in developing a shared vision for the school that is inspirational for the staff. This dimension also indicates the leader's success in communicating optimism about achieving specific school goals. In addition, leaders expect their teachers to hold high performance expectations for students.

The dimension '*Developing People'* refers to the leader's role in acting as a mentor, attending to individual needs and supporting the professional development of the staff. Leaders also encourage staff creativity and help their staff to improve their practice.

The dimension *'Redesigning the Organization'* references the leader's role in creating a cohesive school culture around a common set of values that promote trust among the staff members. To this end, leaders establish working conditions that facilitate staff collaboration for planning and professional development. Leaders also demonstrate sensitivity to parent aspirations by actively encouraging parents and guardians to become involved in their children's education at home and in school (I operationalize this aspect of redesigning the organization as '*Community Focus'*). It is worth mentioning that only the variables measuring *'Community Focus'* loaded on to *'Redesign the organization'* aspect of the transformational leadership index in the countries analyzed. Specifically, '*Community Focus*' in this paper refers to the principal's role in engaging parents in school matters such as serving on school committees pertaining to school finance and personnel, volunteering in the classroom, raising funds for the school and asking parents to attend special school events.

Bass and Avolio (1994) also included a laissez-faire leadership form in their transformational leadership model. Laissez-faire leaders avoid their own supervisory responsibilities. This is thus, essentially a "nonleadership" practice which was excluded from the analysis following the work of Leithwood and Sun (2012) who found that it was not a dimension of transformational leadership.

Finally, a continuous variable BC4GAPIL, which asks school principals the percent of time they spent on instructional leadership over the previous year was used as a measure of instructional leadership. The transactional and instructional leadership indices were originally

conceptualized and constructed as summative scales. A reliability test (Cronbach's Alpha) was then carried out for each of these indices to measure the consistency of each index thus created. However, since Cronbach's Alpha was very low (less than 0.30) for the transactional leadership index and less than 0.38 for instructional leadership in all the countries analyzed except Hong

Table 4: Factor Loadings for Transformational Leadership (Math & Science) - TRTS (School)

Factor Names/Variables	**Factor Loadings**						
Set Directions	**HKG**	**IDN**	**MYS**	**MNG**	**TWN**	**THA**	**USA**
hightch_goals	0.580	0.608	-	0.384	0.673	0.677	0.506
tch_currsuccess	0.763	0.664	-	0.499	0.689	0.692	0.727
high_tchexp	0.514	-	0.500	-	0.578	-	0.686
low_cldist	0.344	-	0.540	0.338	-	-	0.331
enrichment	-	-	0.304	-	-	-	-
high_stuattend	-	-	0.436	-	-	-	-
Eigenvalue	1.910	1.137	0.956	0.851	1.375	0.917	2.013
Proportion Variance Explained	0.474	0.297	0.243	0.273	0.274	0.224	0.472
Develop People							
pd_tchg	0.695	0.798	0.821	0.619	0.811	0.628	0.769
pd_tech	0.526	0.525	0.604	0.539	0.803	0.731	0.641
high_pdschimp	0.674	0.769	0.734	-	0.597	0.689	0.655
peerreview	-	-	-	-	0.301	-	-
Eigenvalue	1.477	1.880	1.855	1.585	2.585	2.112	1.335
Proportion Variance Explained	0.366	0.492	0.471	0.508	0.516	0.517	0.313
Community Focus							
fundraise	0.352	-	0.558	-	0.404	-	-
volunteer	0.514	-	0.445	-	0.633	0.510	0.606
events	0.564	-	0.452	0.329	0.307	0.442	0.585
schcomm	-	0.481	-	-	0.449	0.589	0.349
hwcomplete	-	0.493	0.327	-	-	0.556	-
enrichment	-	-	-	-	0.369	-	-
high_pdschimp	-	-	-	0.424	-	-	-
high_stuattend	-	-	-	0.494	-	-	-
Eigenvalue	0.713	0.688	1.319	0.742	0.878	1.119	1.033
Proportion Variance Explained	0.177	0.180	0.335	0.238	0.175	0.274	0.242
Cumulative Variance Explained	1.016	0.969	1.049	0.780	0.965	1.015	1.027
N	205	268	289	211	248	291	346

** Reporting all factor loadings above .30

Kong, only the variable BC4GAPIL (percent time spent by the principal in instructional leadership) was ultimately used as a measure of instructional leadership in the within country regressions. For transactional leadership two variables 'prin_obs' and 'tch_incentives' were used as mentioned earlier.

Table 5 provides reliability statistics for the transformational leadership index (TRTS II) at the school level. Pearson Correlations for the leadership indices are provided in Appendix A2 and A3. All significant correlations in tables A2 and A3 are below 0.25 at the five percent level.

Table 5: Cronbachs Alpha for Transformational Leadership (Math & Science) – TRTS (School)

Leadership Style	HKG	IDN	MYS	MNG	TWN	THA	USA
Transformational Leadership							
Set Directions	0.625	0.647	0.576	0.384	0.714	0.723	0.668
Develop People	0.717	0.750	0.780	0.575	0.794	0.754	0.760
Community Focus	0.509	0.451	0.498	0.407	0.514	0.644	0.556

Notes:

Transformational index= 3 factors:

Set directions (teacher understanding of schools curricular goals, high teacher expectations for student achievement, low classroom disturbance, high student attendance, principal opinion of the degree of success teachers had in implementing the curriculum).

Develop People (pd to improve teaching, pd for technology, pd for school improvement)

Community Focus (fundraise, events, volunteer, school committees, enrichment, hwcomplete)

2.6.4. Description of Controls

An extensive set of student, teacher and school context variables were used as controls in the analysis. A brief description of these follows. For analysis I (teacher level) I aggregated student background controls such as whether or not the student speaks the language of the test at home (dummy = 1 if language of test is spoken always or almost always at home and dummy=0 otherwise) and mothers' education level (dummy=1 if education level is below a secondary education) at the classroom level by teacher ID. These two variables were used as proxies for

socio-economic status in the regressions. For analysis II and III all student background controls and teacher demographic controls such as teacher age, experience, gender, certification and education were aggregated at the school level instead (by school ID).

Table 6 provides a picture of teachers teaching a representative sample of students in the TIMSS data. Average teacher age in the data ranges from 37 years to 44 years with the teachers in the United States being on the older side (44 years on average) of the age range. Average teacher experience across countries ranges from 10-16 years. Over 91 percent of teachers in Mongolia, Taipei, Thailand and the U.S. have high teacher qualifications and certification. There is a preponderance of female teachers in the U.S., Malaysia and Mongolia compared to Hong Kong, Indonesia, Taiwan and Thailand. At the school level, I controlled for school size, small class size and an index of available school resources for instruction. This index is one of the available TIMSS derived variables ranging from 1 to 3 where 1=High, 2=Medium and 3=Low. A value close to 1 would therefore indicate that the school resources available for instruction are good. Values close to 3 would indicate the opposite. A dummy variable was created from this index where 1 indicates a high level of school resources available for instruction. Similarly, a binary variable was created for class size such that 1=small class (1-24 students) and 0=large class (>24 students).

2.7 Method

Previous research on teacher satisfaction has typically been done at the teacher level using scales to measure teacher satisfaction (see Bogler, 2001 for example). However, as mentioned earlier in section 2.6.1, in TIMSS 2007 the teachers are not a nationally representative sample because the TIMSS data are primarily intended for student level analysis and therefore do not provide appropriate weights for conducting teacher level analyses.

Table 6: Descriptive Statistics for Leadership Indices, Student Background, Teacher Demographic and School Controls (TIMSS 07), School Level

Countries	**HKG**		**IDN**		**MYS**		**MNG**		**TWN**		**THA**		**USA**	
Dependent Variable	*Mean*	*SE*	*Mean*	*SE*	*Mean*	*SE*	*Mean*	*SE*	*Mean*	*SE*	*Mean*	*SE*	*Mean*	*SE*
Teacher Satisfaction (prin)*	0.645	0.055	0.574	0.067	0.829	0.035	0.637	0.059	0.539	0.1	0.704	0.061	0.793	0.052
Teacher Satisfaction (tch)*	0.400	0.044	0.327	0.049	0.657	0.034	0.391	0.051	0.415	0.076	0.423	0.047	0.632	0.041
Leadership Indices														
Transactional Leadership														
Principal Observations	0.973	0.017	0.974	0.02	0.98	0.012	0.971	0.024	0.61	0.103	0.864	0.048	0.952	0.029
Teacher Incentives	0.041	0.022	0.325	0.061	0.428	0.048	0.61	0.051	0.05	0.025	0.346	0.057	0.022	0.008
Transformational Leadership														
Setting Directions	-0.032	0.096	-0.113	0.104	0.062	0.067	0.091	0.074	0.124	0.105	-	-	-0.009	0.136
Developing People	-0.033	0.096	-0.087	0.124	0.001	0.081	0.043	0.094	-0.229	0.145	-0.09	0.104	0.075	0.093
Community Focus	-0.003	0.076	-	-	-	-	-	-	-0.068	0.092	0.036	0.098	0.011	0.043
Instructional Leadership (% time)	20.384	0.804	23.629	1.049	25.016	1.064	22.486	1.218	24.282	1.416	23.077	1.108	22.021	1.575
Aggregated Student Controls														
Language of Test Spoken at Home (0-1)	0.882	1.795	0.34	0.048	0.674	0.027	0.95	0.01	0.741	0.063	0.535	0.056	0.934	0.013
Mothers Education (Less than Secondary) (0-1)	0.892	0.015	0.932	0.016	0.869	0.013	0.719	0.024	0.837	0.033	0.968	0.006	0.462	0.035
Aggregated Teacher Controls														
Teacher Experience (Yrs)	12.841	0.873	10.944	0.622	11.434	0.588	15.015	1.123	10.545	0.684	12.587	0.942	15.545	1.001
Teacher Certification (0-1))	0.896	0.024	0.709	0.045	0.812	0.027	0.959	0.015	0.905	0.032	0.974	0.012	0.98	0.019
Proportion Females	0.379	0.04	0.441	0.042	0.719	0.031	0.773	0.042	0.334	0.062	0.58	0.048	0.676	0.044
Teacher Age (Yrs)	37.731	0.75	37.119	0.61	36.914	0.571	37.294	1.203	38.25	0.731	40.031	0.979	43.571	1.029
Small Class size (0-1)	0.083	0.024	0.167	0.05	0.026	0.017	0.218	0.062	0.271	0.123	0.369	0.066	0.649	0.049
School Controls														
School Size	1019.32	28.16	311.79	28.63	1064.7	55.41	949.8	71.37	991.34	162.31	643.2	53.3	484.97	35.47
School Resources for Math (0-1)	0.735	0.045	0.032	0.012	0.456	0.049	0.038	0.017	0.5	0.089	0.041	0.011	0.522	0.06
Urban (0-1)	0.31	0.05	0.188	0.052	0.107	0.027	0.092	0.05	0.216	0.066	0.034	0.013	0.08	0.024
N	166		234		273		170		202		278		318	

Notes:

1. All means are weighted by school wgt since the numbers are generated from Analysis II & III; SE are linearized.

*2. *The DV teacher satisfaction is a binary variable where 1= v.high/high teacher satisfaction and 0=medium/low satisfaction. Tch=teacher reported; Prin=principal reported*

3. Analysis is for Math and Science teachers

However, the TIMSS data also contain rich contextual data on schools, teachers, and classes useful for a study on leadership. In order to maintain consistency with the research tradition on teacher satisfaction (at the teacher level) but to also use the TIMSS data most effectively, I therefore, conduct three different analyses. The first is an un-weighted analysis at the teacher level (TRTS I). The dependent variable for this analysis is teacher reported satisfaction and all the controls are at the classroom level. The dependent variable for the second analysis remains the same but is aggregated at the school level as are the controls (TRTS II). This analysis is weighted and uses the school weights provided in TIMSS 2007. The third analysis differs in that it examines principal perceptions of teacher satisfaction and explores whether a leader's perceptions differ from teacher perceptions regarding the relationship between leadership style and teacher satisfaction (PRTS III).

2.7.1 Analysis I: Teacher Reported Teacher Satisfaction I (Teacher Level)

Research Question 1: What aspects of a principal's leadership style (transactional, transformational and instructional) are associated with teacher satisfaction in a multi-country context? In analysis I, the dependent variable teacher reported teacher satisfaction (TRTS I) is binary (where 1=v. high/high teacher satisfaction and 0=moderate/low satisfaction). Therefore, a logistic model is used to explore the relationship between leadership style and teacher satisfaction. A major advantage of logistic regression for dichotomous dependent variables is that it constrains the predicted probabilities to the range [0-1] which overcomes an obvious limitation of the linear probability model (Long & Freese, 2006, Menard, 2002). For each country, four models were estimated. These within country regressions were clustered by school ID to account for the fact that teachers are typically clustered within schools.

Model 1 regresses satisfaction on only the leadership indices since these are the key independent variables of interest. Model 1 is given below.

$$odds(Y = 1) = e^{\alpha + \boldsymbol{\beta_1}\mathbf{(transactional)} + \boldsymbol{\beta_2}\mathbf{(transformational)} + \beta_3(\text{instructional})} \quad [1]$$

Where Y is a measure of teacher reported teacher satisfaction for a teacher such that y=1 indicates that teachers are highly satisfied and 0 indicates that they are not satisfied; **transactional** is a vector of two variables measuring transactional leadership; **transformational** is a vector of factor scores measuring the principal's transformational leadership; β_3 is the coefficient on the instructional leadership variable.

Model 2 includes teacher and student controls in addition to the leadership indices. In this model **ST** is a vector of student background and teacher demographic variables which include whether the test language is spoken at home, mothers' education if less than secondary, teacher experience, certification and gender. Due to the high correlation between teacher age and teacher experience (0.89 in Hong Kong for example) only teacher experience was used in the within country regressions. Model 2 is given below.

$$odds(Y = 1) = e^{\alpha + \boldsymbol{\beta_1}\mathbf{(transactional)} + \boldsymbol{\beta_2}\mathbf{(transformational)} + \beta_3(\text{instructional}) + \boldsymbol{\beta_4 ST}} \quad [2]$$

Model 3 regresses satisfaction on only school controls and leadership indices where **SC** is a vector of school controls such as availability of school resources for math instruction, school size and whether the school is urban.

$$odds(Y = 1) = e^{\alpha + \boldsymbol{\beta_1}\mathbf{(transactional)} + \boldsymbol{\beta_2}\mathbf{(transformational)} + \beta_3(\text{instructional}) + \boldsymbol{\beta_4 SC}} \quad [3]$$

Model 4 is the final model and is a complete model that uses all available information.

$$odds(Y = 1) = e^{\alpha + \boldsymbol{\beta_1}\mathbf{(transactional)} + \boldsymbol{\beta_2}\mathbf{(transformational)} + \beta_3(\text{instructional}) + \boldsymbol{\beta_4 ST} + \boldsymbol{\beta_4 SC}} \quad [4]$$

Running the models with a combination of different controls serves as a sensitivity analysis because a consistent finding across all models regardless of the combination of controls used demonstrates the robustness of the results.

2.7.2 Analysis II: Teacher Reported Teacher Satisfaction II (School Level)

This analysis is conducted using the same models outlined above. However, the dependent variable (teacher reported teacher satisfaction (TRTS) and all student and teacher controls are aggregated at the school level. The advantage of this analysis is that it extends generalizability of inferences as compared to the teacher level analysis because in TIMSS 2007 the schools are nationally representative while the teachers are not. Further, since TIMSS 2007 data provide an appropriate probability weight for school level analysis, it also addresses issues associated with the complex sampling structure of the data. For Analysis II, the school weight (schwgt) provided in TIMSS 2007 is applied to all the within country regressions by using the *svyset* command in STATA. This command accounts for the clustering of teachers within schools in the data.

2.7.3 Analysis III: Principal Reported Teacher Satisfaction (School Level)

Research Question 2: Does the observed relationship between principal leadership style and teachers' job satisfaction vary when the outcome variable (teacher satisfaction) is principal reported rather than teacher reported? TIMSS 2007 provide the unique opportunity to compare

principal and teacher perceptions of teacher satisfaction. Given that teacher satisfaction is an important construct, it is both interesting and relevant to our understanding of the relationship between teacher satisfaction and leadership style, to unpack how principal and teacher perceptions differ with respect to satisfaction. In order to address research question 2 therefore, I retain the same models as for research question 1, keeping all controls and independent variables identical in order to facilitate comparison and maintain consistency. The key difference is that the outcome variable (teacher satisfaction) in these regressions is principal reported rather than teacher reported.

Model 1 regressed principal reported satisfaction on only the leadership indices since these are the key independent variables of interest. Model 1 is given below.

$$odds(Y = 1) = e^{\alpha + \boldsymbol{\beta_1}\mathbf{(transactional)} + \boldsymbol{\beta_2}\mathbf{(transformational)} + \beta_3(\text{instructional})} \quad [1]$$

Where Y is a measure of principal reported teacher satisfaction for a teacher such that y=1 indicates that teachers are highly satisfied and 0 indicates that they are not satisfied; **transactional** is a vector of variables measuring transactional leadership; **transformational** is a vector of factor scores that measure the principal's transformational leadership; instructional is the variable indicative of instructional leadership.

Model 2 included aggregated teacher and student controls in addition to the leadership indices. In this model **ST** is a vector of aggregated student background and teacher demographic variables which include whether the test language is spoken at home, mothers' education if less than secondary, teacher experience, certification and gender. Due to the high correlation

between teacher age and teacher experience (0.89 in Hong Kong for example) only teacher experience was used in the within country regressions. Model 2 is given below.

$$odds(Y = 1) = e^{\alpha + \boldsymbol{\beta_1}\mathbf{(transactional)} + \boldsymbol{\beta_2}\mathbf{(transformational)} + \beta_3(\text{instructional}) + \boldsymbol{\beta_4 ST}} \quad [2]$$

Model 3 regressed principal reported satisfaction on only school controls and leadership indices where **SC** is a vector of school controls such as availability of school resources for math instruction, school size and whether the school is urban.

$$odds(Y = 1) = e^{\alpha + \boldsymbol{\beta_1}\mathbf{(transactional)} + \boldsymbol{\beta_2}\mathbf{(transformational)} + \beta_3(\text{instructional}) + \boldsymbol{\beta_4 SC}} \quad [3]$$

Model 4 is a complete model that used all available variables for analysis.

$$odds(Y = 1) = e^{\alpha + \boldsymbol{\beta_1}\mathbf{(transactional)} + \boldsymbol{\beta_2}\mathbf{(transformational)} + \beta_3(\text{instructional}) + \boldsymbol{\beta_4 ST} + \boldsymbol{\beta_4 SC}} \quad [4]$$

2.8 Results

2.8.1 Analysis I: Research Question 1 (Teacher Level – Unweighted)

2.8.11 Hong Kong (SAR) Results. Results are presented by country for all analyses. Table 7 shows results of Analysis 1 organized by country. This is a teacher level analysis where the dependent variable is teacher reported satisfaction. In Hong Kong, principal observation of teachers for evaluative purposes is negatively correlated with teacher satisfaction in models 1, 3 and 4. The principal's role in setting directions for the school is significantly and positively associated with greater teacher satisfaction in the sample ($p<.01$) across all models controlling for an extensive set of student, teacher background and school controls. Larger school size is

also positively associated with higher teacher satisfaction ($p<.10$) in the sample (model 4) controlling for aggregated student, teacher and school level variables.

2.8.12 Indonesia Results. In Indonesia, the principal's role in setting directions is significantly associated with greater teacher satisfaction across all the models specified ($p<.01$) in the sample. Mother's education (secondary or less) is negatively associated with teacher satisfaction in the sample ($p<.10$).

2.8.13 Malaysia Results. In Malaysia aspects of leadership style are not significantly associated with teacher satisfaction for teachers teaching a representative sample of students. What appears to matter at the teacher level is whether or not students speak the language of the test at home and school size. Models 2 and 4 indicate that if a student speaks the test language teacher satisfaction in the sample is higher than if they do not ($p<.01$). Model 3 shows that school size is positively correlated with teacher satisfaction in the TIMSS sample. At the teacher level there are no significant results for Mongolia.

2.8.14 Taiwan Results. In Taiwan, it appears that the percentage of time spent by the principal on instructional leadership is significantly associated with teacher satisfaction in the data. No other variables are significant.

2.8.15 Thailand Results. Similar to Malaysia, in Thailand leadership style is not significantly associated with teacher satisfaction in the data. Contextual variables such as mother's education level, small class size and teacher gender appear to matter more for teacher satisfaction in this sample. For example, teacher satisfaction is lower if mother's education level (aggregated to the classroom level) is lower secondary. Teacher satisfaction is higher for female teachers in the sample.

2.8.16 U.S.A. Results. For the U.S.A., the principal's role is developing capacity among staff members is positively associated with teacher satisfaction in the data ($p<.01$). In addition, mothers education level (secondary or below) is associated with lower teacher satisfaction ($p<.01$).

2.8.2 Analysis II: Research Question 1 (School Level – Weighted)

Results for Analysis II are presented by country in table 8 and also briefly summarized below. For this analysis the dependent variable is teacher perception of teacher satisfaction, which is aggregated by school. The strength of this analysis lies in the fact that the results obtained are generalizable and consistent with the sampling structure of the TIMSS data compared to Analysis I.

2.8.21 Hong Kong (SAR) Results. Similar to Analysis I, in Hong Kong, principal observation of teachers for evaluative purposes is negatively correlated with teacher satisfaction in models 1, 3 and 4. The principal's role in setting directions for the school is significantly and positively associated with teacher satisfaction ($p<.01$) across all models controlling for an extensive set of student, teacher background and school controls.

2.8.22 Indonesia Results. In Indonesia, the principal's role in setting directions for the staff and school (which is a key component of transformational leadership) is positively and significantly associated with teacher satisfaction ($p<.01$) across all models irrespective of the introduction of a specific set of controls in each model. No demographic variables are statistically significant.

2.8.23 Malaysia Results. In Malaysia, aspects of the principal's transactional leadership (the practice of contingent reward), specifically the use of teacher incentives in the form of a bonus, housing or pay in retaining grade 8 teachers appears to be negatively correlated with

teacher satisfaction ($p<.01$) though this association is not robust to the introduction of student, teacher and school controls. The aspect of transformational leadership that seems to matter positively for average teacher satisfaction in Malaysia is the principal's role in developing staff capacity in schools ($p<.01$) though even this association does not hold in the complete model (model 4). We do see a significant positive relationship in the final model between teacher satisfaction and test language (a proxy for socio-economic status) if the language of the test is spoken at home ($p<.10$).

2.8.24 Mongolia Results. In Mongolia, the principals role in 'developing people' is negatively associated with teacher satisfaction ($p<.05$) while the aspect of transformational leadership that matters is the principal's effort to engage parents in the education of their children through participation in school committees and events ('Community Focus' $p<.01$). The availability of good school resources for instruction also appears to be statistically significant ($p<.05$) and positively correlated with teacher satisfaction in at least two models (model 3 & 4). Additionally, contextual variables like test language and small class have a small but significant negative association with teacher satisfaction ($p<.10$).

2.8.25 Taiwan Results. In Taiwan, the transactional leadership practice – *management by exception* as measured by principal observation of teacher practice for evaluation is positively associated with teacher satisfaction ($p<.10$) for models 1 and 3 though this association does not hold in the complete model. Similar to Mongolia, school context variables like 'test language' and 'small class size' appear to be important in the Taiwanese context ($p<.05$). Teachers in whose classes students speak the test language at home appear to have high satisfaction levels as opposed to those whose students do not.

2.8.26 Thailand Results. In Thailand, student socio-economic status as measured by mother's education level appears to be negatively correlated with teacher satisfaction ($p<.05$). Female teachers in Thai schools have a higher satisfaction level than male teachers and this effect is found to be statistically significant ($p<.01$).

2.8.27 U.S.A. Results. In the U.S.A., the aspect of transformational leadership that appears to matter is the principal's role in setting directions. The relationship is positive and statistically significant across all models ($p<.01$) much like Hong Kong and Indonesia. In addition, the principal's effort to 'develop people' is negatively correlated with teacher satisfaction ($p<.10$). Socio-economic status as measured by two proxy variables –lower secondary education level of parents and speaking the test language at home is negatively associated with teacher satisfaction. School and classroom context variables such as small class and urbanicity are both positively associated with teacher satisfaction ($p<.10$ respectively).

2.8.3 Analysis III: Research Question 2 (School Level – Weighted)

Analysis III focuses on aspects of a principal's leadership style (transactional, transformational and instructional) and principal perceptions of teacher satisfaction. Table 9 presents results of four logistic models for each of the 7 countries. The results of Analysis III are also briefly summarized by country below.

2.8.31 Hong Kong (SAR) Results. Similar to the teacher level analysis, in Hong Kong, the principal's role in setting directions for the school is significantly and positively correlated with principal perceptions of teacher satisfaction ($p<.01$) across all models. In addition, 'community focus' is negatively correlated with principal reported teacher satisfaction ($p<.10$) in models 1 & 2 though this effect does not hold in the comprehensive model (model 4). Additionally, teacher and school context variables like teacher experience and school size are

significant and positively associated with principal reported satisfaction ($p<.10$). In Hong Kong it appears that principals in Hong Kong perceive that male teachers in their schools experience higher satisfaction levels as compared to females.

2.8.32 Indonesia Results. In Indonesia, the principal's instructional leadership is negatively correlated with principal reported teacher satisfaction ($p<0.5$) across all models. Aspects of the principal's transformational leadership such as *setting directions* and *developing people* are also positively and significantly ($p<.01$) associated with principal reported teacher satisfaction in that country. Teacher experience in Indonesia is negatively correlated with principal reported teacher satisfaction levels ($p<.10$). Similar to Hong Kong, principals perceive that female teachers have lower satisfaction levels as compared to male teachers.

2.8.33 Malaysia Results. In Malaysia as well, aspects of a principal's transformational leadership that matter are the principal's role in '*setting directions'* and '*developing people'* across all models ($p<.05$ and $p<.01$ respectively). In addition, principals perceive teacher satisfaction to be lower in large schools ($p<.10$) though this association does not hold in model 4.

2.8.34 Mongolia Results. In Mongolia principal's perceive that the leadership practice *management by exception* as measured by principal observation of teachers for evaluation is significantly and negatively correlated with teacher satisfaction ($p<.05$) and that this effect holds across all models. They also attach importance to behaving in a more transformational manner as is evident by the significant association between '*setting directions'* and principal perception of teacher satisfaction ($p<.05$). Principals in Mongolia also perceive school and classroom context variables such as urbanicity and small class size to be positively associated with teacher satisfaction ($p<.05$ respectively).

2.8.35 Taiwan Results. Principals in Taiwan prioritize aspects of transformational leadership such as *'setting directions'* and '*developing people*' ($p<.01$; $p<.10$ respectively). Principals perceive that teacher demographics such as teacher experience are positively correlated with teacher satisfaction ($p<.10$). They also perceive large schools to be positively associated with satisfaction (model 3). Finally, principals in Taiwan perceive small class sizes to be negatively associated with teacher satisfaction ($p<.01$).

2.8.36 Thailand Results. The transactional leadership practice *management by exception* as measured by principal observation of teachers is perceived by Thai principals to be significantly and positively associated with teacher satisfaction ($p<.10$). Similarly, Thai principals perceive the use of teacher incentives to be strongly and positively correlated with teacher satisfaction ($p<.01$) and this result holds across all models for Thailand. Principals in Thailand also believe that behaving in a more transformational manner (specifically their role in setting directions for the school as well as providing a strong community focus) is associated with higher teacher satisfaction in their schools ($p<.01$) and this result too is consistent across all models for Thailand. In addition, contextual variables such as level of mother's education (secondary or less) is positively associated with principal reported teacher satisfaction ($p<.01$).

2.8.37 U.S.A Results. Principals in the U.S.A. perceive aspects of both transactional and transformational leadership to be associated significantly with teacher satisfaction levels in their schools. In particular, principal observation of teachers for evaluative purposes and the principals role in setting directions are both perceived to be positively correlated with teacher satisfaction ($p<.05$, $p<.01$ respectively). Principals feel that the use of teacher incentives is negatively correlated with teacher satisfaction levels ($p<.10$). Principals also tend to attach importance to school context variables such as school size, good school facilities and small class

size in relation to how satisfied their teachers feel. A high level of resources available for instruction is positively associated with teacher satisfaction in their schools ($p<.05$) as is small class size ($p<.05$). Principals in the U.S.A. also perceive their teachers to be more satisfied in larger schools ($p<.05$). The variable test language spoken at home is negatively correlated with principal perception of teacher satisfaction.

2.9 Discussion

2.9.1 Research Question 1

Of the three leadership styles (transactional, instructional and transformational) the variables indicative of the principal's transformational leadership are consistently and significantly associated with principal reported teacher satisfaction (Analysis III) across all the countries analyzed. These variables are also significantly associated with teacher reported satisfaction (Analysis II) in five of the seven countries analyzed. Aspects of the transformational leadership index that appear to matter most are the principal's role in '*setting directions'* and in '*developing people*.' These leadership dimensions are conceptually equivalent to what Bass and Avolio (1994) conceptualized as the 4 I's i.e. "idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration" (Leithwood & Sun, 2012).

The direction of the association between the '*setting directions*' dimension of transformational leadership and teacher satisfaction (principal reported) are consistent across the six countries analyzed in Asia and the U.S. What the data are telling us is that in general principals in Asia perceive that their teachers are more satisfied when they behave in a more transformational manner. Results from teacher reported satisfaction at the school level (Analysis II) corroborate an emphasis on the 'setting directions' aspect of transformational leadership in three of the seven countries analyzed. These are Hong Kong, Indonesia, and the U.S.A. Results

are less clear cut in the teacher level analysis (Analysis I) though this set of results needs to be interpreted with caution because they are not generalizable.

With respect to the other independent variables, aggregated student background, teacher demographic controls, and school level controls were introduced separately in models 2 and 3 respectively and then comprehensively in the complete model. The purpose was to determine whether teacher and school controls are significantly associated with teacher satisfaction regardless of the key leadership indices of interest and also to test the robustness of findings across the models. Results of the complete model (model 4) indicate support for the recent view that organizational factors such as principal leadership are important for teacher satisfaction (Johnson, Kraft & Papay, 2011; Ladd, 2011).

However, contextual variables also appear to be important in many of the countries analyzed. For example, the variable named 'test language spoken at home,' which is used as a proxy for socioeconomic status is significantly ($p<0.05$) associated with principal reported teacher satisfaction in Thailand and the U.S. even after the introduction of organizational variables implying that in these countries socioeconomic composition of schools is significantly associated with principal reported teacher satisfaction independent of the effect of leadership style and other teacher demographic and school level controls. In other words, in Thailand and the U.S. (which are both relatively unequal societies)[15] principals perceive that student background matters for teacher satisfaction.

Other school and classroom contextual variables such as level of school resources available for instruction and small class size also appear to be significantly correlated with principal perceptions of teacher satisfaction. For example, principals in the U.S.A. and

[15] The gini index for the U.S.A is 45.0 (2007); the gini index for Thailand is 53.6 (2009) on a scale of 0-100. The more unequal a country's income distribution is, the higher the gini index. An index of 53.6 is considered high. Source: https://www.cia.gov/library/publications/the-world-factbook/rankorder/2172rank.html

Malaysia perceive the presence of a high level of school resources available for instruction as being important for teacher satisfaction. Given the variation in resources/facilities within schools and across school districts in the U.S.A. (the Gini index for the U.S. is 45.0 (2007))[16], this is not surprising. Inner city urban schools for example might have fewer resources available to the teachers as compared with richer suburban schools. This result is corroborated by scholars such as Buckley, Schneider and Shang (2005), and Schneider (2003) who underscore the importance of good school facilities as central to the process of teaching and learning.

I find that the direction of the association between small class size and math teacher satisfaction varies by country. In Mongolia and the U.S.A. there is a positive association between principal perception of teacher satisfaction and small class size. In Taiwan and Thailand, on the other hand, the association is negative. This finding is fairly non-intuitive at first glance. However, many Asian countries have a strongly imbedded collectivist culture so it is not unlikely that Taiwanese and Thai teachers attach less importance to individualized student attention, which is often only possible in small class sizes. These countries have moderately large class sizes (25-40 students).

One understanding that emerges with respect to demographic controls is that there is no clear pattern that emerges across all Asian countries and all models analyzed. The direction of the association too appears to vary from one country to the next unlike the results for leadership style which appear to be fairly consistent between countries.

2.9.2 Research Question 2

Interestingly, this analysis also shows that teacher perceptions of leadership behavior and their satisfaction levels differ from principal perceptions of leadership behavior and teacher satisfaction (Tables 8 & 9). In the case of Hong Kong and Indonesia I find that teacher and

[16] Source: https://www.cia.gov/library/publications/the-world-factbook/rankorder/2172rank.html

principal perceptions are similar with respect to dimensions of transformational leadership that matter for teacher satisfaction. The leadership dimension that appears to matter for teachers of a representative sample of students in Hong Kong is the principal's ability to 'set directions' for the school and to hold high performance expectations for achievement. Given the emphasis placed on academic achievement (Cheong, 2000) in Hong Kong and the fact that public examinations form an important systemic component of the school system in Hong Kong this is not surprising.

In Indonesia, the transformational leadership dimension that seems to matter from the perspective of the principal is the principals' ability to 'develop people' by investing in their staff and providing increased opportunities for self-improvement. Given that a school-based management (SBM) system has been instituted in Indonesia under which teachers are expected to contribute to curriculum development, it is understandable that principals would choose to emphasize the professional development of their staff to build capacity in their schools. Teachers teaching in a representative sample of schools in Indonesia, however, perceive the principals' transformational leadership in 'setting directions' to be more significant for their overall sense of well-being and satisfaction. This may be due to the fact that teacher empowerment as a concept is still nascent in Indonesia. In order to eventually have the requisite freedoms to effect curriculum changes geared to local needs they need their principals to exercise their authority and behave in a transformational way that will inspire such change.

In Malaysia, principals believe that behaving in a more transformational manner (*setting directions, developing people*) is associated with better odds of teacher satisfaction. Teachers teaching a representative sample of students in Malaysia, however, perceive no significant association with the 'setting directions' aspect of transformational leadership and a negative

correlation between a principal's transactional leadership and teacher satisfaction ($p<.10$). In addition, principals perceive school context variables such as school resources ($p<.05$) and school size ($p<10$) to be significantly correlated with teacher satisfaction in Malaysia, while student background in the classroom matters more from a teacher perspective ($p<.01$). This finding appears to reflect their respective spheres of influence. In other words, the results mirror the centrality of the school for the principal versus the centrality of the classroom for the teacher.

Teachers teaching a representative sample of students in Taiwan do not perceive a significant correlation between how a principal behaves and their satisfaction levels. This may be due to the fact that teacher incentives are generally government funded and insured and are not controlled by school principals. It may also be the case that though education authority has formally decentralized from central to local governments and from local governments to schools, traditional ideology still prevails and therefore, decentralization in Taiwan does not necessarily imply less central control. Research shows that Taiwanese principals are somewhat reluctant to cede administrative power to teachers and likewise the teachers are reluctant to exceed the parameters of their traditional roles (Pan & Chen, 2011). Results from analysis II appear to provide some support for this reasoning. Interestingly, principal perceptions about their teachers' satisfaction differed markedly from the perceptions of the teachers discussed above. Similar to Malaysia, student background (test language spoken at home) matters for teacher satisfaction ($p<0.05$) in the Taiwanese sample. The role of teachers in Taiwan goes beyond merely imparting subject matter knowledge. Teachers are also expected to support the personal and social development of students and to foster good behavior. Thus, teachers play a role similar to that of parents in terms of providing personal guidance and acting as role models for

the children. With this backdrop it seems reasonable that student backgrounds (and subsequent classroom behavior) would be important from a teacher's perspective.

In Thailand, aspects of the principal's transactional leadership (*contingent reward and management by exception*) were significantly and positively associated with principal reported teacher satisfaction ($p<0.01$). This appears to imply that principals in Thailand play a more traditional leadership role vis-à-vis their staff. Under the transactional leadership style the leader monitors the performance of teachers and interacts with them if their performance deviates from expected norms. This mode of operating is fairly consistent with Thailand's more hierarchical leadership structure as well as Thai cultural parameters which reward compliance and non-confrontational behavior. This may also be the reason why Thai teachers in the TIMSS sample do not perceive principals' transformational behaviors to be significantly associated with their satisfaction levels. Additionally, Thailand is a community based culture. Thai culture encourages interdependence and a 'we' consciousness (Hallinger & Kantamara, 2000). In keeping with Thai collectivist culture, principals in Thailand also appear to prioritize parent school interactions as shown by the significance of the '*community focus*' dimension within transformational leadership.

The following section explores in greater detail how rich country context may help explain the results for Hong Kong – a country that has in recent years begun to attract greater research attention.

2.10 Contextual Discussion of Results in Hong Kong

2.10.1 Country Background: Hong Kong has a population of around 7 million people living in a small area of 1,000 square kilometers (OECD, 2010). The population of Hong Kong is unique in that it is one hundred percent urban. The average GDP per capita is above USD

42,000 also making it among the ten richest nations (OECD, 2010) in the world. The population is predominantly ethnic Chinese with a few Caucasians from Western countries. A small percentage of the population is from Indonesia and the Philippines. Chinese and English are the official languages in Hong Kong though Cantonese (a dialect of Chinese) is spoken by the majority of the people. According to the 2006 population by-census, approximately 90 percent of the population age 5 and above speak Cantonese (TIMSS 2011 Encyclopedia). "The government has adopted a biliterate (English and Chinese) and trilingual (Putonghua, Cantonese, & English) policy for the education system" (TIMSS 2011 Encyclopedia, p.369). However, most primary schools use Cantonese as the medium of instruction. Secondary schools wishing to use English as a medium of instruction require government approval.

Historically, Hong Kong was a British colony for a ninety-nine year period until the year 1997 when it reverted back to China under the "one country, two systems" notion. Under this arrangement, China resumed sovereignty over Hong Kong but Hong Kong remained a separate jurisdiction enjoying autonomy in all areas except military defence and diplomatic relations. As a Special Administrative Region of China (SAR), Hong Kong has an independent legislature, its own currency and its own policies independent of the national government in Beijing. Nonetheless, Hong Kong shares certain cultural values and similarities with China such as a long tradition of valuing education highly and high hopes for the educational attainment of school children. Implicit in this cultural respect for education is belief in the philosophy that hard work can transcend difficult learning environments and is a means of social mobility. This has in turn translated into a zest for credentials and an almost exclusive emphasis on examination results for validating genuine learning (OECD, 2010).

Although cultural values and traditions overlap between Hong Kong and China, Hong Kong's education system is quite distinct from that of the rest of China with its own unique structure and reform trajectory.

2.10.2 Overview of Educational System: The educational system in Hong Kong was initially modelled on the British system with six years of primary education (grades 1-6), five years of secondary education (Secondary 1-5), two years of pre-university study (Secondary 6-7) culminating in three years of university education. This structure may have been in large measure due to its colonial legacy. In recent years however, a number of policy reforms have been implemented that have modified the system.

In 2009 a new 6-3-3-4 structure was instituted (6 years of primary, 3 years of lower secondary, 3 years of upper secondary followed by 4 years of university education) consistent with the system currently followed in China and many other parts of the world. It would be fair to say that the Hong Kong education system is very much "a hybrid of Chinese culture and British traditions" (OECD, 2010). The reform introduced in 2009 has kept the curriculum for the first nine years of compulsory basic education essentially unchanged though the old system of streaming by subject from grade 10 onward has been dropped. All students are now expected to take four core subjects, which are English Language, Chinese Language, Mathematics and Liberal Studies. A new examination to be taken at the end of grade 12 (Secondary 6) known as the *Hong Kong Diploma of Secondary Education Examination* introduced in 2012 has replaced two exams taken at the end of grades 11 and 13 previously.

The Hong Kong Education Bureau (EDB) is the body primarily responsible for formulating policy and introducing legislation on education from the pre-primary to the tertiary level though preprimary education in Hong Kong is not considered part of compulsory education

and all Kindergartens are in fact privately managed. The EDB essentially administers more than 1000 schools. All schools in Hong Kong need to be registered under the EDB's *Education Ordinance* and to observe the bureau's regulations. Advice on curriculum development at all levels is provided by the *Curriculum Development Council*, which is a freestanding advisory body appointed by the Chief Executive in Hong Kong. Additionally, the EDB provides a list of "acceptable" textbooks and teaching materials for all subjects and all grade levels. These lists are not mandated. Interestingly, however, nearly all local schools revert to using them potentially indicating that centralized influence on curriculum and instruction remains fairly strong in schools. The EDB recommends the use of both formative and summative assessments to collect information on student learning. Nevertheless, tests and exams are still the primary method to inform teachers of the learning levels of their students.

In addition to public schools, schools in Hong Kong are classified as aided schools, direct subsidy schools and international schools. Aided schools are free and funded by the government but run by a private sponsor. Direct subsidy schools are private schools that receive some government funding. International schools are country-specific schools that teach a curriculum from their own country.

2.10.3 Profile of Teachers in Hong Kong: Anyone wishing to teach is required to register under the EDB's *Education Ordinance* as either a registered teacher or a permitted teacher. Registered teachers are those with approved teaching qualifications and experience as stated in the ordinance. Permitted teachers hold requisite academic qualifications but have no teacher training and are given permits by the EDB to teach specified subject(s) in specified schools. The number of permitted teachers however, appears to be small. In 2010-11 for example, approximately 95.7 percent of primary school teachers and 94.4 percent of secondary

school teachers were professionally trained (TIMSS 2011). In addition, there are specialist teachers who usually teach math and science at the secondary level and sometimes at the primary level as well.

The TIMSS 2007 data for Hong Kong show that on average the teachers sampled are 38 years old. Average teacher experience is approximately 12.87 years and teachers with this level of experience also have higher odds of job satisfaction as compared with teachers who are younger. On average, teacher perceptions of their satisfaction are reportedly lower (0.40) than principal perceptions of teacher satisfaction (0.65). One reason for this dichotomy may be the high power distance between principals and teachers which presumably detracts from teachers' sense of autonomy in the workplace. The data also show that the majority of teachers (90 percent) in the TIMSS sample possess teacher certification. This is consistent with the fact that generally speaking professional training for teachers is prioritized in Hong Kong. Additionally, the TIMSS data show that at the Secondary level the proportion of male teachers is higher than female teachers.

2.10.4 School Leadership in Hong Kong: Hong Kong is a society that exhibits a high "power-distance" in its relationships between leaders and followers (Walker, Lee & Bryant, 2014). A high power distance culture implies that subordinates maintain a respectable distance from their leaders and do not question the leader's mandates. This is because in such societies disagreement with authority is construed as a sign of disrespect. In this respect, Hong Kong is not very different from other Asian societies many of which (Thailand for example) are also high power distance cultures.

Despite this power distance however, teachers in Hong Kong are likely to perceive leadership practices around quality assurance and accountability as negative (Walker, Lee &

Bryant, 2014). The TIMSS 2007 data for Hong Kong appear to support this finding. The odds of teacher satisfaction among teachers teaching a representative sample of students in Hong Kong are lower when certain accountability mechanisms such as principal observation of teaching are put into effect.

It is entirely possible that a cultural disconnect between externally imposed accountability requirements and cultural realities within schools is responsible for the negative response (Walker & Qian, 2012). This disconnect often arises from a blind adoption of policies from societies with very different sociocultural traditions and values. Given that Hong Kong's accountability policy framework was originally taken from the UK, this explanation is fairly plausible. The data show that even in hierarchically structured societies such as Hong Kong observation of teachers' classroom practices is interpreted as principal intrusion into teachers' traditional domains presumably because such practices generate a negative pressure on teachers.

An area of difficulty for principals in Hong Kong is providing incentives for teachers (Cheong, 2000). This is because the salary structure for teachers in Hong Kong is fairly rigid and there are few opportunities available for promotion. The principal therefore has little discretion to reward teachers. This context also helps to explain why in the case of Hong Kong the coefficient on the variable measuring the relationship between teacher incentives and teacher satisfaction is insignificant.

It has been argued that developing and effectively utilizing structures of communication for school improvement is essential to the work of school leaders (Walker et al. 2014). My results pertaining to the association between dimensions of transformational leadership and teacher satisfaction seem to corroborate this viewpoint. Specifically, I find that when principals in Hong Kong prioritize fostering a shared vision and common school goals among members of

the school community teacher reported satisfaction is higher. This is indicated by the positive odds ratio on the *setting directions* aspect of transformational leadership. This finding is also consistent with earlier work on leadership behavior in Hong Kong (see Chui, Sharpe, & McCormick, 1996).

The *setting direction* dimension of transformational leadership is also indicative of the expectations teachers hold with respect to student performance. The positive association between setting direction and teacher reported satisfaction is again congruent with what we know about learning environments in Hong Kong. High principal and teacher expectations for student achievement are in keeping with the fact that Hong Kong has prioritized student learning through all its different reform phases.

In sum, while principals' efforts to effectively communicate with their teachers with respect to their school's mission and goals is important (as shown in my analysis), extant research also indicates that in developing communication frameworks within their schools, school leaders in Hong Kong will need to leverage the influence of societal culture in a manner that best supports positive teacher and student outcomes. In particular, leaders would need to be sensitive to the existence of a power distance between them and their staff and make a concerted and conscious effort to empower their teachers to participate in school-wide decisions.

2.11 Conclusion and Limitations

Despite a growing recognition in the field of the importance of context and its influence on practice it has not been adequately explored in the literature. By attempting to parse out aspects of leadership that matter in diverse geographic and social contexts that differ substantively from the U.S.A., this paper makes a valuable contribution to the existing body of knowledge on leadership. Additionally, the analysis benefits from the use of internationally

recognized large-scale survey data (TIMSS 2007) with high levels of comparability and reliability in the instruments across countries. Only a few scholars (Sargent & Hannum, 2005 and Michaelowa & Wittman, 2007) have previously attempted to use large-scale survey data to understand and explore the notion of teacher satisfaction albeit in different geographic and cultural contexts from the one analyzed here.

This is one of the first multi-country, large-scale analyses to examine both principal and teacher perspectives on teacher satisfaction for several countries in Asia and the U.S. after accounting for an extensive range of aggregated student and teacher demographic variables and school controls. A very clear pattern that emerges from this analysis is that principals' transformational leadership is significantly associated with principal reported teacher satisfaction across all the Asian countries analyzed as well as the United States ($p<.01$). This appears to indicate that a visionary and supportive leadership style as measured by the transformational leadership index is important for teacher satisfaction in a multi-country context at least from the perspective of the school principals in these countries. Specifically, two dimensions of transformational leadership - the principal's role in '*setting directions*' for the school and in '*developing people*' were found to be consistently associated with higher odds of teacher satisfaction in the countries analyzed. This finding is also consistent with the U.S. literature on transformational leadership in schools.

Interestingly, this pattern is not so evident when we analyze teacher perspectives on satisfaction and leadership style (with the exception of the teachers sampled in Hong Kong, Indonesia and Malaysia). Teachers of a representative sample of students in Mongolia, Taiwan and Thailand seem to attach more importance to student and school background variables (with respect to their satisfaction levels) than particular aspects of transformational or instructional

leadership. One possible reason for this divergence in perspectives may be that principals in several of the countries analyzed are acting on the notions of transformational leadership considered appropriate by their Ministries (who in turn may be influenced by the politics and processes of globalization and policy borrowing) but that these principals are still in the process of operationalizing these predominantly Western notions in the context of their respective educational systems, many of which are still fairly centralized (See Steiner-Khamsi, 2004 for an understanding of policy borrowing in Mongolia). As such, aspects of transformational leadership such as '*setting directions*' and '*developing people*' which are inherently western conceptualizations of leadership might not be well understood or easily internalized by teachers in these countries. This may explain why principals in all the countries analyzed perceive these dimensions to be highly significant while teachers in this sample (with the exception of Hong Kong, Indonesia and Malaysia) do not.

An alternative explanation is that the divergence in perspectives simply mirrors the centrality of the school for the principal versus the centrality of the classroom for the teacher. Irrespective of the underlying reasons for differing principal and teacher perspectives on teacher satisfaction, from a policy perspective this analysis provides an opportunity for school leaders to gain a richer understanding of particular aspects of leadership behavior that work to make their teachers more satisfied and therefore more likely to be productive and to stay committed to their schools in the long term. Understanding the nuances of leadership behavior and its variations in myriad settings has much to teach us about the task of changing schools and improving practice.

Nonetheless, the paper also has several limitations. First, because the main purpose of the analysis is to deconstruct the type of leadership that matters in the Asian context, investigating the complexity of interrelationships between the different types of leadership

behaviors[17] is beyond the scope of this analysis. Additionally, although there are aspects of transformational and instructional leadership that overlap (such as creation of a school vision, professional development of teachers etc.) care was taken to minimize such overlaps in creating indices of transformational and instructional leadership so as to avoid issues of multicollinearity.

Second, TIMSS 2007 mainly allows analysis of dyadic pairs of teachers and principals in schools. This deviates from the literature on teacher satisfaction which ideally references a larger sample of teachers than is available via TIMSS. That said, TIMSS is the only large-scale survey data publicly available that collects rich contextual information on students, teachers and schools for several countries in Asia. Within Asia, OECD's TALIS 2008 contains information for only Japan and S. Korea.

Third, the analysis is correlational in nature. Causal arguments cannot be made about the associations between leadership and satisfaction.

Future research can be enriched further in one of two ways. First, the use of qualitative fieldwork may provide valuable insight into the satisfaction-leadership relationship by adding finer grained level of information at the teacher level not generally available through survey data. Second, the use of sub-scales measuring the satisfaction construct rather than a global measure of satisfaction as used in this analysis may facilitate a more nuanced understanding of teacher satisfaction.

[17] See for example Marks and Printy (2003) who show that instructional leadership may also be transformational in some instances.

Table 7: Table of Results for Teacher perception of Teacher Satisfaction & Principal Leadership Style (Analysis I - Teacher Level)

	HONG KONG (SAR)				INDONESIA				MALAYSIA			
VARIABLE NAMES	**(1)**	**(2)**	**(3)**	**(4)**	**(1)**	**(2)**	**(3)**	**(4)**	**(1)**	**(2)**	**(3)**	**(4)**
Transactional Leadership												
prinobs	0.286*	0.263	0.184**	0.150**	1.551	1.398	2.003	1.781	0.378	0.474	0.346	0.427
	(0.216)	(0.241)	(0.131)	(0.115)	(1.182)	(1.044)	(1.462)	(1.252)	(0.425)	(0.544)	(0.365)	(0.474)
tch_incentives	1.680	1.599	2.064	1.741	0.968	0.943	1.039	1.080	0.731	0.673	0.704	0.675
	(1.000)	(1.245)	(1.363)	(1.368)	(0.224)	(0.230)	(0.270)	(0.291)	(0.182)	(0.176)	(0.178)	(0.178)
Instructional Leadership												
Percent time (yr) on IL	1.006	1.019	1.013	1.026	0.990	0.990	0.983	0.984	1.005	1.002	1.004	1.004
	(0.019)	(0.022)	(0.021)	(0.024)	(0.012)	(0.013)	(0.013)	(0.014)	(0.011)	(0.012)	(0.011)	(0.013)
Transformational Leadership												
set_directions	2.022***	1.762**	2.165***	1.975***	2.128***	2.177***	2.015***	2.071***	1.258	1.138	1.252	1.147
	(0.431)	(0.399)	(0.520)	(0.478)	(0.338)	(0.376)	(0.357)	(0.391)	(0.176)	(0.176)	(0.182)	(0.181)
dev_people	0.818	0.824	0.819	0.836	1.072	1.106	0.962	0.956	1.229	1.126	1.177	1.138
	(0.148)	(0.158)	(0.158)	(0.170)	(0.139)	(0.152)	(0.139)	(0.147)	(0.190)	(0.177)	(0.186)	(0.184)
community_focus	0.830	0.862	0.756	0.763	-	-	-	-	-	-	-	-
	(0.173)	(0.194)	(0.163)	(0.170)	-	-	-	-	-	-	-	-
Language of Test is Spoken at Home		1.014		1.009		0.998		0.997		1.018***		1.016***
		(0.025)		(0.027)		(0.003)		(0.004)		(0.004)		(0.005)
Mothers Education		1.102		0.474		0.479		0.256*		0.902		0.929
		(1.339)		(0.625)		(0.291)		(0.199)		(0.942)		(1.037)
Teacher Experience (Yrs)		0.980		0.984		0.981		0.981		1.012		1.014
		(0.016)		(0.018)		(0.016)		(0.018)		(0.015)		(0.016)
Female Teacher		0.945		0.865		0.773		0.795		0.635		0.653
		(0.315)		(0.293)		(0.189)		(0.213)		(0.196)		(0.202)
Small Class Size		0.619		0.628		0.557		0.702		1.815		1.877
		(0.317)		(0.330)		(0.223)		(0.320)		(1.928)		(2.028)
School Size			1.001	1.002*			1.001	1.000			0.999***	1.000
			(0.001)	(0.001)			(0.000)	(0.000)			(0.000)	(0.000)
Good School Facility			0.914	0.792			2.050	1.560			0.974	0.908
			(0.343)	(0.324)			(1.096)	(0.896)			(0.248)	(0.246)
Urban			1.017	0.776			1.497	1.616			0.614	0.782
			(0.348)	(0.305)			(0.452)	(0.522)			(0.227)	(0.329)
Constant	2.004	0.645	0.618	0.532	0.509	1.779	0.299	1.841	4.556	1.765	11.59**	2.988
	(1.552)	(1.811)	(0.764)	(1.670)	(0.421)	(1.923)	(0.243)	(2.144)	(5.229)	(2.838)	(12.79)	(4.957)
Observations	211	190	201	182	361	344	334	317	307	297	305	295

Notes: *1. All coefficients shown are odds ratios; 2. Std errors given in parentheses; 3. ***p<0.01, **p<0.05, *p<0.10; 4. DV=teacher perception of satisfaction.*

Model 1= Teacher satisfaction on indices of leadership; Model 2=teacher satisfaction on leadership indices with student/teacher controls aggregated by teacher; Model 3 = satisfaction on leadership with only school controls and model 4=Complete model with satisfaction regressed on all available variables.

Table 7 (cont'd)

COUNTRY NAMES	MONGOLIA				TAIWAN			
VARIABLE NAMES	**(1)**	**(2)**	**(3)**	**(4)**	**(1)**	**(2)**	**(3)**	**(4)**
Transactional Leadership								
prinobs	2.089	2.396	1.938	2.124	1.437	1.232	1.353	1.230
	(2.502)	(2.980)	(2.267)	(2.672)	(0.423)	(0.393)	(0.420)	(0.409)
tch_incentives	1.140	1.021	1.272	1.119	3.258	3.168	6.261	6.320
	(0.326)	(0.310)	(0.388)	(0.361)	(2.741)	(2.788)	(7.008)	(7.415)
Instructional Leadership								
Percent time (yr) on IL	0.996	0.993	0.995	0.996	0.988	0.978*	0.986	0.976*
	(0.013)	(0.014)	(0.014)	(0.015)	(0.011)	(0.012)	(0.011)	(0.013)
Transformational Leadership								
set_directions	0.946	0.821	0.879	0.783	1.063	1.104	1.092	1.122
	(0.193)	(0.183)	(0.196)	(0.191)	(0.160)	(0.182)	(0.171)	(0.192)
dev_people	1.126	1.150	1.053	1.036	1.088	1.048	1.190	1.152
	(0.246)	(0.286)	(0.250)	(0.282)	(0.173)	(0.177)	(0.209)	(0.216)
community_focus	-	-	-	-	1.048	1.160	1.029	1.133
	-	-	-	-	(0.188)	(0.239)	(0.194)	(0.245)
Language of Test is Spoken at Home		0.977		0.978		1.009		1.010
		(0.015)		(0.017)		(0.008)		(0.008)
Mothers Education		0.688		1.287		1.225		1.384
		(0.514)		(1.165)		(0.982)		(1.321)
Teacher Experience (Yrs)		1.013		1.006		0.979		0.982
		(0.015)		(0.015)		(0.017)		(0.018)
Female Teacher		0.770		0.622		0.935		0.847
		(0.301)		(0.261)		(0.266)		(0.259)
Small Class Size		0.577		0.684		0.608		0.687
		(0.303)		(0.410)		(0.368)		(0.435)
School Size			1.000	1.000			1.000	1.000
			(0.000)	(0.000)			(0.000)	(0.000)
Good School Facility			3.272	3.563			1.241	1.311
			(2.484)	(2.983)			(0.351)	(0.407)
Urban			1.128	1.232			0.846	0.793
			(0.807)	(0.895)			(0.279)	(0.317)
Constant	0.357	4.768	0.287	2.649	1.088	0.823	0.923	0.561
	(0.434)	(8.784)	(0.341)	(5.290)	(0.407)	(0.950)	(0.419)	(0.714)
Observations	204	188	189	174	248	225	230	209

Notes:

*1. All coefficients shown are odds ratios; 2. Std errors given in parentheses; 3. ***p<0.01, **p<0.05, *p<0.10; 4. DV=teacher perception of satisfaction.*

Model 1= Teacher satisfaction on indices of leadership; Model 2=teacher satisfaction on leadership indices with student/teacher controls aggregated by teacher; Model 3 = satisfaction on leadership with only school controls and model 4=Complete model with satisfaction regressed on all available variables.

Table 7 (cont'd)

COUNTRY NAMES	THAILAND				USA			
VARIABLE NAMES	**(1)**	**(2)**	**(3)**	**(4)**	**(1)**	**(2)**	**(3)**	**(4)**
Transactional Leadership								
prinobs	1.340	1.255	1.802	1.603	1.832	1.631	1.822	1.664
	(0.538)	(0.524)	(0.828)	(0.716)	(1.156)	(1.129)	(1.159)	(1.133)
tch_incentives	0.940	0.819	0.942	0.879	0.672	0.807	0.692	0.852
	(0.236)	(0.227)	(0.256)	(0.253)	(0.253)	(0.338)	(0.265)	(0.363)
Instructional Leadership								
Percent time (yr) on IL	1.005	0.994	1.002	0.998	0.996	0.996	0.997	0.997
	(0.010)	(0.011)	(0.012)	(0.012)	(0.007)	(0.008)	(0.007)	(0.008)
Transformational Leadership								
set_directions	-	-	-	-	0.930	0.917	0.919	0.901
	-	-	-	-	(0.096)	(0.104)	(0.097)	(0.105)
dev_people	1.239	1.110	1.153	1.113	1.869***	1.657***	1.920***	1.726***
	(0.185)	(0.176)	(0.178)	(0.178)	(0.202)	(0.198)	(0.213)	(0.212)
community_focus	0.965	0.956	1.003	0.999	1.128	1.131	1.121	1.126
	(0.150)	(0.150)	(0.162)	(0.163)	(0.179)	(0.200)	(0.180)	(0.198)
Language of Test is Spoken at Home		0.994		0.994		0.997		0.995
		(0.003)		(0.004)		(0.006)		(0.006)
Mothers Education		0.039***		0.071**		0.295***		0.277***
		(0.040)		(0.085)		(0.105)		(0.104)
Teacher Experience (Yrs)		1.002		1.005		1.003		0.999
		(0.013)		(0.014)		(0.009)		(0.010)
Female Teacher		1.900**		1.728**		1.016		1.029
		(0.518)		(0.475)		(0.197)		(0.203)
Small Class Size		0.481*		0.539		1.279		1.252
		(0.196)		(0.227)		(0.239)		(0.243)
School Size			1.000***	1.000			1.000	1.000
			(0.000)	(0.000)			(0.000)	(0.000)
Good School Facility			1.061	0.943			0.929	0.862
			(0.403)	(0.406)			(0.166)	(0.167)
Urban			0.526	0.538			1.146	1.003
			(0.244)	(0.261)			(0.260)	(0.246)
Constant	0.679	19.60**	0.319**	6.737	0.692	1.568	0.783	2.455
	(0.308)	(24.07)	(0.172)	(9.513)	(0.428)	(1.459)	(0.501)	(2.402)
Observations	289	287	281	279	626	564	608	548

Notes:

*1. All coefficients shown are odds ratios; 2. Std errors given in parentheses; 3. ***p<0.01, **p<0.05, *p<0.10; 4. DV=teacher perception of satisfaction.*

Model 1= Teacher satisfaction on indices of leadership; Model 2=teacher satisfaction on leadership indices with student/teacher controls aggregated by teacher; Model 3 = satisfaction on leadership with only school controls and model 4=Complete model with satisfaction regressed on all available variables.

Table 8: Table of Results for Teacher Perception of Teacher Satisfaction & Principal Leadership Style (Analysis II - School Level)

	HONG KONG (SAR)				INDONESIA				MALAYSIA			
VARIABLE NAMES	**(1)**	**(2)**	**(3)**	**(4)**	**(1)**	**(2)**	**(3)**	**(4)**	**(1)**	**(2)**	**(3)**	**(4)**
Transactional Leadership												
Principal observation	0.113*	0.124	0.087**	0.088**	2.754	2.912	3.112	3.201	1	1	1	1
	(0.145)	(0.169)	(0.097)	(0.093)	(3.607)	(3.931)	(3.815)	(4.005)				
Teacher incentives	2.366	2.542	2.470	2.160	0.895	0.725	0.856	0.717	0.570*	0.584	0.595	0.609
	(1.717)	(2.391)	(1.880)	(2.121)	(0.356)	(0.311)	(0.351)	(0.317)	(0.188)	(0.197)	(0.193)	(0.203)
Instructional Leadership												
Percent time (yr) on IL	0.997	1.007	1.007	1.020	1.012	1.012	1.002	1.004	0.994	0.985	0.993	0.988
	(0.020)	(0.023)	(0.021)	(0.024)	(0.019)	(0.019)	(0.020)	(0.022)	(0.013)	(0.015)	(0.013)	(0.014)
Transformational Leadership												
Set directions	1.844**	1.765**	1.927**	1.920**	2.816***	2.921***	2.836***	3.037***	1.115	1.052	1.108	1.111
	(0.440)	(0.483)	(0.512)	(0.527)	(0.848)	(0.863)	(0.922)	(0.953)	(0.248)	(0.213)	(0.234)	(0.213)
Develop people	0.857	0.872	0.825	0.826	1.259	1.396	1.167	1.242	1.364*	1.254	1.376*	1.294
	(0.184)	(0.204)	(0.185)	(0.197)	(0.233)	(0.294)	(0.240)	(0.292)	(0.241)	(0.228)	(0.238)	(0.232)
Community focus	0.742	0.772	0.712	0.748	-	-	-	-	1.101	1.146	1.153	1.184
	(0.173)	(0.189)	(0.160)	(0.172)	-	-	-	-	(0.209)	(0.228)	(0.222)	(0.233)
Language of Test is Spoken at Home		1.005		0.999		0.994		0.995		1.020***		1.021***
		(0.023)		(0.024)		(0.007)		(0.007)		(0.006)		(0.006)
Mothers Education		2.321		1.247		0.208		0.267		1.583		0.936
		(3.200)		(1.945)		(0.229)		(0.331)		(2.071)		(1.334)
Teacher Experience (Yrs)		0.972		0.971		0.961		0.957		0.997		0.995
		(0.018)		(0.019)		(0.029)		(0.031)		(0.017)		(0.017)
Female Teacher		0.981		0.844		0.853		0.756		0.765		0.743
		(0.381)		(0.341)		(0.393)		(0.388)		(0.325)		(0.327)
Small Class Size		0.865		0.968		0.435		0.559		0.954		0.995
		(0.655)		(0.772)		(0.239)		(0.329)		(0.599)		(0.610)
School Size			1.001	1.002			1.001	1.001			1.000	1.000
			(0.001)	(0.001)			(0.001)	(0.001)			(0.000)	(0.000)
Good School Facility			0.952	0.829			0.983	1.037			0.874	0.825
			(0.400)	(0.361)			(0.737)	(0.844)			(0.266)	(0.257)
Urban			0.927	0.875			1.072	1.090			0.468*	0.650
			(0.358)	(0.410)			(0.491)	(0.514)			(0.202)	(0.291)
Constant	6.213	2.148	1.484	1.141	0.157	1.618	0.128	1.046	3.035***	0.870	3.248**	0.972
	(8.220)	(6.107)	(2.528)	(3.472)	(0.223)	(2.924)	(0.177)	(1.894)	(1.157)	(1.079)	(1.640)	(1.377)
Observations	195	177	186	169	254	254	235	235	278	272	276	270

Notes:

*1. All coefficients shown are odds ratios; 2. Std errors given in parentheses; 3. ***p<0.01, **p<0.05, *p<0.10; 4. DV=teacher perception of satisfaction. Model 1= Teacher satisfaction on indices of leadership; Model 2=teacher satisfaction on leadership indices with student/teacher controls aggregated by teacher; Model 3 = satisfaction on leadership with only school controls and Model 4=Complete model with satisfaction regressed on all available variables.*

Table 8 (cont'd)

COUNTRY NAMES	MONGOLIA				TAIWAN			
VARIABLE NAMES	**(1)**	**(2)**	**(3)**	**(4)**	**(1)**	**(2)**	**(3)**	**(4)**
Transactional Leadership								
prinobs	4.036	5.031	3.271	3.445	2.573*	1.660	2.455*	1.810
	(4.926)	(6.059)	(3.523)	(3.635)	(1.464)	(0.664)	(1.240)	(0.773)
tch_incentives	1.345	1.184	1.624	1.334	2.490	2.303	3.609	3.326
	(0.526)	(0.465)	(0.668)	(0.569)	(2.170)	(2.381)	(4.110)	(4.299)
Instructional Leadership								
Percent time (yr) on IL	1.002	0.996	0.988	0.987	1.009	0.996	1.008	0.995
	(0.021)	(0.022)	(0.020)	(0.021)	(0.019)	(0.019)	(0.019)	(0.021)
Transformational Leadership								
set_directions	0.985	1.227	0.859	0.987	0.866	1.012	0.966	1.088
	(0.333)	(0.397)	(0.250)	(0.314)	(0.212)	(0.219)	(0.228)	(0.265)
dev_people	0.654	0.613	0.540**	0.478**	1.342	1.133	1.291	1.124
	(0.203)	(0.184)	(0.150)	(0.142)	(0.301)	(0.255)	(0.302)	(0.262)
community_focus	2.454**	2.775***	3.129***	3.482***	1.087	1.335	1.049	1.264
	(0.853)	(1.041)	(1.052)	(1.340)	(0.300)	(0.404)	(0.291)	(0.435)
Language of Test is Spoken at Home		0.937*		0.945*		1.021*		1.023**
		(0.033)		(0.028)		(0.011)		(0.011)
Mothers Education		0.836		1.888		3.961		9.128
		(0.927)		(2.581)		(4.227)		(12.89)
Teacher Experience (Yrs)		1.021		1.012		0.986		0.985
		(0.020)		(0.019)		(0.021)		(0.024)
Female Teacher		1.077		0.774		0.770		0.656
		(0.487)		(0.358)		(0.315)		(0.297)
Small Class Size		0.306*		0.411		0.180**		0.192**
		(0.216)		(0.264)		(0.125)		(0.152)
School Size			1.000	1.000			1.000	1.000
			(0.000)	(0.000)			(0.000)	(0.000)
Good School Facility			10.78***	14.42**			0.742	1.135
			(9.012)	(15.06)			(0.300)	(0.518)
Urban			1.963	2.325			1.144	1.408
			(2.116)	(2.433)			(0.684)	(0.827)
Constant	0.121*	57.45	0.115**	22.22	0.372	0.071*	0.328	0.022**
	(0.148)	(204.0)	(0.123)	(67.14)	(0.280)	(0.106)	(0.263)	(0.039)
Observations	202	187	189	174	242	220	224	204

Notes:

*1. All coefficients shown are odds ratios; 2. Std errors given in parentheses; 3. ***p<0.01, **p<0.05, *p<0.10; 4. DV=teacher perception of satisfaction.*

Model 1= Teacher satisfaction on indices of leadership; Model 2=teacher satisfaction on leadership indices with student/teacher controls aggregated by teacher; Model 3 = satisfaction on leadership with only school controls and Model 4=Complete model with satisfaction regressed on all available variables.

Table 8 (cont'd)

COUNTRY NAMES	THAILAND				USA			
VARIABLE NAMES	**(1)**	**(2)**	**(3)**	**(4)**	**(1)**	**(2)**	**(3)**	**(4)**
Transactional Leadership								
prinobs	1.041	0.881	1.280	1.096	1.786	0.784	1.827	0.821
	(0.652)	(0.519)	(0.813)	(0.674)	(1.383)	(0.806)	(1.426)	(0.805)
tch_incentives	1.001	0.983	1.042	1.049	0.923	1.468	0.943	1.168
	(0.343)	(0.371)	(0.367)	(0.393)	(0.497)	(0.814)	(0.597)	(0.703)
Instructional Leadership								
Percent time (yr) on IL	1.020	1.000	1.028	1.007	1.014	1.022	1.020	1.021
	(0.019)	(0.019)	(0.020)	(0.020)	(0.015)	(0.014)	(0.015)	(0.014)
Transformational Leadership								
set_directions	1.292	1.081	1.287	1.177	1.730***	1.495**	1.794***	1.563**
	(0.307)	(0.291)	(0.340)	(0.329)	(0.289)	(0.271)	(0.297)	(0.277)
dev_people	1.182	1.098	1.159	1.119	0.799	0.678	0.740	0.652*
	(0.242)	(0.244)	(0.234)	(0.242)	(0.181)	(0.164)	(0.170)	(0.161)
community_focus	1.263	1.251	1.440	1.366	1.261	1.312	1.107	1.244
	(0.343)	(0.300)	(0.379)	(0.339)	(0.302)	(0.389)	(0.260)	(0.363)
Language of Test is Spoken at Home		0.999		1.000		0.970**		0.972*
		(0.005)		(0.005)		(0.015)		(0.015)
Mothers Education		0.125		0.0196**		0.153**		0.260
		(0.175)		(0.038)		(0.132)		(0.221)
Teacher Experience (Yrs)		0.996		0.996		1.003		1.006
		(0.021)		(0.021)		(0.022)		(0.023)
Female Teacher		3.921***		3.754***		2.037		1.941
		(1.670)		(1.634)		(1.050)		(1.029)
Small Class Size		0.576		0.564		2.477**		2.458*
		(0.269)		(0.270)		(1.102)		(1.170)
School Size			1.000	1.000			1.000	1.000
			(0.000)	(0.000)			(0.000)	(0.000)
Good School Facility			0.796	0.581			1.255	0.961
			(0.445)	(0.380)			(0.401)	(0.326)
Urban			0.936	1.119			2.137*	1.806
			(0.885)	(0.989)			(0.849)	(0.671)
Constant	0.510	3.721	0.312	19.83	1.132	32.50*	0.877	16.06
	(0.420)	(6.463)	(0.255)	(43.23)	(0.877)	(65.86)	(0.723)	(33.39)
Observations	289	287	281	279	339	328	328	318

Notes:

*1. All coefficients shown are odds ratios; 2. Std errors given in parentheses; 3. ***p<0.01, **p<0.05, *p<0.10; 4. DV=teacher perception of satisfaction.*

Model 1= Teacher satisfaction on indices of leadership; Model 2=teacher satisfaction on leadership indices with student/teacher controls aggregated by teacher; Model 3 = satisfaction on leadership with only school controls and Model 4=Complete model with satisfaction regressed on all available variables.

Table 9: Table of Results for Principal Perception of Teacher Satisfaction & Principal Leadership Style (Analysis III - School Level)

	HONG KONG (SAR)				INDONESIA				MALAYSIA			
VARIABLE NAMES	**(1)**	**(2)**	**(3)**	**(4)**	**(1)**	**(2)**	**(3)**	**(4)**	**(1)**	**(2)**	**(3)**	**(4)**
Transactional Leadership												
Principal observation	3.079	1.518	2.421	1.430	5.151	4.774	8.825	7.675	-	-	-	-
	(4.292)	(1.781)	(3.255)	(1.647)	(5.892)	(5.971)	(12.04)	(11.76)	-	-	-	-
Teacher incentives	0.233	0.178	0.189	0.0911	0.788	0.516	0.769	0.528	0.691	0.824	0.687	0.850
	(0.272)	(0.268)	(0.240)	(0.158)	(0.430)	(0.285)	(0.441)	(0.321)	(0.386)	(0.460)	(0.391)	(0.492)
Instructional Leadership												
Percent time (yr) on IL	1.016	1.047	1.027	1.056	0.915***	0.913***	0.905***	0.903**	0.999	1.006	1.010	1.013
	(0.030)	(0.033)	(0.033)	(0.035)	(0.031)	(0.031)	(0.034)	(0.035)	(0.027)	(0.031)	(0.029)	(0.031)
Transformational Leadership												
Set directions	3.950***	5.607***	3.204***	5.480***	12.31***	15.56***	12.24***	15.71***	1.809*	1.828*	2.238**	2.207**
	(1.266)	(2.087)	(1.048)	(2.239)	(5.915)	(7.653)	(6.044)	(7.715)	(0.641)	(0.656)	(0.823)	(0.825)
Develop people	1.135	1.016	1.292	1.156	3.024***	3.389***	2.853***	3.248***	2.578***	2.563***	2.574***	2.500***
	(0.350)	(0.328)	(0.429)	(0.419)	(0.819)	(0.977)	(0.801)	(0.987)	(0.702)	(0.678)	(0.699)	(0.690)
Community focus	0.479*	0.421*	0.578	0.489	-	-	-	-	0.823	0.900	0.690	0.800
	(0.201)	(0.193)	(0.219)	(0.213)	-	-	-	-	(0.265)	(0.281)	(0.234)	(0.262)
Language of Test is Spoken at Home		0.978		0.972		1.004		1.005		0.997		0.996
		(0.018)		(0.019)		(0.010)		(0.012)		(0.010)		(0.010)
Mothers Education		0.227		0.081		0.200		0.280		0.187		0.443
		(0.772)		(0.334)		(0.400)		(0.618)		(0.557)		(1.339)
Teacher Experience (Yrs)		1.045**		1.039*		0.942**		0.947*		0.969		0.967
		(0.023)		(0.023)		(0.026)		(0.027)		(0.026)		(0.026)
Female Teacher		0.288***		0.232***		0.442*		0.381*		0.794		0.839
		(0.133)		(0.114)		(0.204)		(0.192)		(0.350)		(0.412)
Small Class Size		0.819		0.960		0.300		0.289		0.131		0.132
		(0.602)		(0.667)		(0.223)		(0.217)		(0.175)		(0.166)
School Size			1.002	1.003*			1.001	1.001			0.999*	0.999
			(0.001)	(0.002)			(0.000)	(0.001)			(0.000)	(0.000)
Good School Facility			1.460	1.330			0.561	0.517			0.305**	0.294**
			(0.758)	(0.690)			(0.744)	(0.769)			(0.154)	(0.149)
Urban			1.488	0.924			1.396	1.587			6.582	5.095
			(1.069)	(0.684)			(1.058)	(1.191)			(7.666)	(5.972)
Constant	0.600	17.37	0.0564	3.936	4.174	83.36*	2.433	36.68	6.986***	54.91	18.04***	75.27
	(0.862)	(59.22)	(0.117)	(16.06)	(5.327)	(201.5)	(3.532)	(104.0)	(4.846)	(152.6)	(17.59)	(212.8)
Observations	195	177	186	169	255	255	236	236	279	273	277	271

Notes:

*1. All coefficients shown are odds ratios; 2. Std errors given in parentheses; 3. ***p<0.01, **p<0.05, *p<0.10; 4. DV=principal perception of teacher satisfaction.*

Model 1= Teacher satisfaction on indices of leadership; Model 2=teacher satisfaction on leadership indices with student/teacher controls aggregated by teacher; Model 3 = satisfaction on leadership with only school controls and model 4=Complete model with satisfaction regressed on all available variables.

Table 9 (cont'd)

COUNTRY NAMES	MONGOLIA				TAIWAN			
VARIABLE NAMES	**(1)**	**(2)**	**(3)**	**(4)**	**(1)**	**(2)**	**(3)**	**(4)**
Transactional Leadership								
prinobs	0.118**	0.102**	0.104**	0.0628**	2.597	2.159	2.274	2.828
	(0.106)	(0.103)	(0.093)	(0.071)	(2.281)	(1.522)	(1.943)	(2.520)
tch_incentives	1.372	1.187	1.236	1.391	1.122	0.915	1.771	1.492
	(0.634)	(0.547)	(0.579)	(0.698)	(1.270)	(1.187)	(2.612)	(2.636)
Instructional Leadership								
Percent time (yr) on IL	0.977	0.977	0.967	0.951*	0.997	0.980	0.992	0.988
	(0.021)	(0.021)	(0.023)	(0.025)	(0.021)	(0.025)	(0.031)	(0.032)
Transformational Leadership								
set_directions	3.660***	3.001***	3.049***	2.383**	2.437**	5.788***	8.626***	16.84***
	(1.367)	(1.211)	(1.198)	(1.018)	(0.956)	(3.715)	(5.741)	(14.80)
dev_people	1.631	1.366	1.426	1.005	2.642**	1.258	2.036*	1.331
	(0.589)	(0.528)	(0.556)	(0.419)	(1.162)	(0.473)	(0.850)	(0.508)
community_focus	1.502	1.549	1.597	1.838	0.478*	0.621	0.411*	0.510
	(0.562)	(0.641)	(0.666)	(0.854)	(0.187)	(0.264)	(0.200)	(0.297)
Language of Test is Spoken at Home		0.991		0.999		1.007		1.007
		(0.029)		(0.025)		(0.017)		(0.017)
Mothers Education		1.250		11.28		0.0668		0.207
		(1.530)		(20.63)		(0.112)		(0.695)
Teacher Experience (Yrs)		1.024		1.031		1.080**		1.099*
		(0.021)		(0.022)		(0.039)		(0.053)
Female Teacher		1.094		0.827		1.711		1.836
		(0.599)		(0.484)		(0.862)		(1.050)
Small Class Size		14.88**		23.89***		0.009***		0.020***
		(16.30)		(27.27)		(0.011)		(0.027)
School Size			1.000	1.001			1.002***	1.001
			(0.000)	(0.001)			(0.001)	(0.000)
Good School Facility		-	-	-			0.423	0.670
		-	-	-			(0.303)	(0.410)
Urban			9.700	28.30**			1.151	0.714
			(13.97)	(46.41)			(1.251)	(1.029)
Constant	18.48***	20.60	27.02***	2.826	0.961	6.500	0.253	0.617
	(18.27)	(63.08)	(28.97)	(7.503)	(0.922)	(16.19)	(0.314)	(2.111)
Observations	203	187	180	165	241	219	223	203

Notes:

*1. All coefficients shown are odds ratios; 2. Std errors given in parentheses; 3. ***p<0.01, **p<0.05, *p<0.10; 4. DV=principal perception of teacher satisfaction.*

Model 1= Teacher satisfaction on indices of leadership; Model 2=teacher satisfaction on leadership indices with student/teacher controls aggregated by teacher; Model 3 = satisfaction on leadership with only school controls and model 4=Complete model with satisfaction regressed on all available variables.

Table 9 (cont'd)

COUNTRY NAMES	THAILAND				USA			
VARIABLE NAMES	**(1)**	**(2)**	**(3)**	**(4)**	**(1)**	**(2)**	**(3)**	**(4)**
Transactional Leadership								
prinobs	4.627	5.794*	4.793	5.435*	3.075	1.556	8.122**	8.522**
	(4.470)	(5.546)	(4.687)	(5.443)	(2.782)	(1.699)	(8.444)	(9.057)
tch_incentives	3.417*	8.022***	3.893*	8.259***	0.152***	0.165**	0.167	0.108*
	(2.355)	(5.356)	(2.867)	(5.748)	(0.102)	(0.145)	(0.183)	(0.122)
Instructional Leadership								
Percent time (yr) on IL	0.988	0.984	0.992	0.984	1.005	1.019	1.033	1.045
	(0.041)	(0.035)	(0.045)	(0.038)	(0.021)	(0.022)	(0.025)	(0.030)
Transformational Leadership								
set_directions	5.980***	6.150***	6.508***	6.275***	4.575***	5.140***	6.278***	7.935***
	(2.812)	(2.932)	(3.381)	(3.156)	(1.793)	(2.034)	(2.305)	(3.381)
dev_people	1.026	0.925	1.038	0.947	1.207	0.941	0.901	0.681
	(0.352)	(0.383)	(0.364)	(0.393)	(0.391)	(0.319)	(0.294)	(0.217)
community_focus	3.089***	3.712***	2.979***	3.594***	2.007	2.236	1.764	1.963
	(1.080)	(1.376)	(1.087)	(1.374)	(1.774)	(2.507)	(1.589)	(1.928)
Language of Test is Spoken at Home		0.979**		0.979**		0.942**		0.911***
		(0.009)		(0.009)		(0.023)		(0.031)
Mothers Education		204.7***		51.08		0.118		0.156
		(395.6)		(142.1)		(0.207)		(0.321)
Teacher Experience (Yrs)		1.076**		1.077**		1.011		1.006
		(0.032)		(0.032)		(0.015)		(0.015)
Female Teacher		0.497		0.499		2.246		2.051
		(0.260)		(0.262)		(1.151)		(0.931)
Small Class Size		0.085***		0.077***		5.047**		2.191
		(0.066)		(0.062)		(3.792)		(1.385)
School Size			1.000	1.000			0.999	0.998**
			(0.001)	(0.001)			(0.001)	(0.001)
Good School Facility			0.420	1.400			4.565*	6.737**
			(0.359)	(1.588)			(3.730)	(5.732)
Urban			0.307	0.550			1.305	1.399
			(0.430)	(0.782)			(1.091)	(1.367)
Constant	1.804	0.0571	1.697	0.280	2.270	577.3**	0.587	5,098**
	(1.989)	(0.139)	(2.108)	(0.883)	(2.060)	(1,668)	(0.687)	(19,150)
Observations	289	287	281	279	339	328	328	318

Notes:

*1. All coefficients shown are odds ratios; 2. Std errors given in parentheses; 3. ***p<0.01, **p<0.05, *p<0.10; 4. DV=principal perception of teacher satisfaction.*

Model 1= Teacher satisfaction on indices of leadership; Model 2=teacher satisfaction on leadership indices with student/teacher controls aggregated by teacher; Model 3 = satisfaction on leadership with only school controls and model 4=Complete model with satisfaction regressed on all available variables.

APPENDIX

Table A2: Pearson Correlations for Principal and Teacher Perceptions of Teacher Satisfaction

ANALYSIS I – TRTS TEACHER LEVEL: Pearson Correlations for Dependent Variables

	HKG		IDN		MYS		MNG		TWN		THA		USA	
Variable Name	tsatistch	tsatisprin	tsatistch	tsatisprin	tsatistch	tsatisprin	tsatistch	tsatisprin	tsatistch	tsatisprin	tsatistch	tsatisprin	tsatistch	tsatisprin
tsatis_teacher	1		1		1		1		1		1		1	
tsatis_principal	0.146*	1	0.196*	1	0.061	1	0.103	1	0.205*	1	0.084	1	0.255*	1
	0.019		0.001		0.277		0.099		0		0.145		0	

ANALYSIS II – TRTS SCHOOL LEVEL: Pearson Correlations for Dependent Variables

	HKG		IDN		MYS		MNG		TWN		THA		USA	
Variable Name	tsatistch	tsatisprin	tsatistch	tsatisprin	tsatistch	tsatis_prin	tsatis_tch	tsatis_prin	tsatis_tch	tsatis_prin	tsatis_tch	tsatis_prin	tsatistch	tsatisprin
tsatis_teacher	1		1		1		1		1		1		1	
tsatis_principal	0.152*	1	0.223*	1	0.043	1	0.103	1	0.202*	1	0.084	1	0.293*	1
	0.022		0		0.456		0.104		0.001		0.145		0	

ANALYSIS III – PRTS SCHOOL LEVEL: Pearson Correlations for Dependent Variables

	HKG		IDN		MYS		MNG		TWN		THA		USA	
Variable Name	tsatistch	tsatisprin	tsatistch	tsatisprin	tsatistch	tsatisprin	tsatistch	tsatisprin	tsatistch	tsatisprin	tsatistch	tsatisprin	tsatistch	tsatisprin
tsatis_teacher	1		1		1		1		1		1		1	
tsatis_principal	0.152*	1	0.223*	1	0.043	1	0.103	1	0.202*	1	0.084	1	0.293*	1
	0.022		0		0.456		0.104		0.001		0.145		0	

Notes:

1. *Indicates significance level $p<0.05$
2. The dependent variable tsatis_teacher = teacher perception of teacher satisfaction; tsatis_principal=principal perception of teacher satisfaction

Table A3: Pearson Correlations for Leadership Indices – Analysis I (Teacher Level)

HKG:	prinobs	tch_incent	BC4GAPIL	set_directions	dev_people	comm_focus
prinobs	1					
tch_incent	0.1706* 0.006	1				
BC4GAPIL	0.1942* 0.0022	-0.055 0.3928	1			
set_directions	0.0208 0.7574	0.0778 0.2475	-0.1996* 0.0036	1		
dev_people	0.0861 0.2003	-0.0317 0.6377	0.0824 0.2332	0.0285 0.6719	1	
comm_focus	0.0185 0.784	-0.0195 0.7724	-0.1599* 0.0202	0.0626 0.3524	0.0626 0.3518	1

IDN:	prinobs	tch_incent	BC4GAPIL	set_directions	dev_people
prinobs	1				
tch_incent	-0.0228 0.6441	1			
BC4GAPIL	0.1520* 0.0021	0.0492 0.3265	1		
set_directions	0.1474* 0.0039	0.106* 0.0405	0.084 0.1067	1	
dev_people	0.1432* 0.0051	0.0798 0.1236	-0.0114 0.827	0.0665 0.1953	1

Notes:

*indicates sig p <0.05

Table A3 (cont'd)

MYS:	prinobs	tch_incent	BC4GAPIL	set_directions	dev_people
prinobs	1				
tch_incent	-0.0265 0.6357	1			
BC4GAPIL	0.1349* 0.0154	0.0976 0.0818	1		
set_directions	-0.069 0.2219	0.1565* 0.0056	-0.1894* 0.0008	1	
dev_people	-0.0832 0.1406	-0.1056 0.0624	0.0093 0.8707	0.0072 0.8986	1

MNG:	prinobs	tch_incent	BC4GAPIL	set_directions	dev_people
prinobs	1				
tch_incent	0.0345 0.5715	1			
BC4GAPIL	0.0453 0.4585	0.0629 0.3065	1		
set_directions	0.0225 0.7438	0.0251 0.7182	-0.0352 0.6128	1	
dev_people	0.0455 0.5086	0.0442 0.5249	-0.1468* 0.0339	0.0708 0.3034	1

Notes:

*indicates sig p <0.05

Table A3 (cont'd)

TWN:	prinobs	tch_incent	BC4GAPIL	set_directions	dev_people	comm_focus
Prinobs	1					
tch_incent	0.1814* 0.0015	1				
BC4GAPIL	-0.0809 0.1665	-0.0296 0.6136	1			
set_directions	0.2106* 0.0007	0.1058 0.0932	0.0957 0.1311	1		
dev_people	0.2290* 0.0002	0.0763 0.2264	0.0521 0.4122	0.1182 0.06	1	
comm_focus	0.2158* 0.0005	-0.0617 0.3283	0.1185 0.0614	0.0483 0.4437	-0.0075 0.9053	1

THA:	prinobs	tch_incent	BC4GAPIL	dev_people	comm_focus
Prinobs	1				
tch_incent	0.1455* 0.012	1			
BC4GAPIL	0.0491 0.3972	0.0664 0.2529	1		
dev_people	0.1781* 0.0023	0.174 0.003	* 0.0093 0.8748	1	
comm_focus	0.1227* 0.0365	-0.0025 0.9669	-0.0475 0.4197	0.1230* 0.036	1

Notes:

*indicates sig p <0.05

Table A3 (cont'd)

USA:	prinobs	tch_incent	BC4GAPIL	set_directions	dev_people	comm_focus
prinobs	1					
tch_incent	0.0339 0.3363	1				
BC4GAPIL	0.1257* 0.0006	-0.1980* 0	1			
set_directions	0.1178* 0.0027	0.0549 0.1637	0.1848* 0	1		
dev_people	0.1054* 0.0074	-0.0992* 0.0117	0.0830* 0.0376	0.1039* 0.0083	1	
comm_focus	-0.0418 0.2891	0.0499 0.206	0.1142* 0.0041	0.023 0.559	-0.0257 0.5152	1

Notes:

*indicates sig p <0.05

Table A4: Pearson Correlations for Leadership Indices - Analysis II (School Level)

HKG:	prinobs	tch_incent	BC4GAPIL	set_directions	dev_people	comm_focus
prinobs	1					
tch_incent	-0.2483* 0.0001	1				
BC4GAPIL	0.1703* 0.0114	-0.0797 0.2412	1			
set_directions	0.0437 0.534	0.0261 0.7105	-0.1919* 0.0072	1		
dev_people	0.0792 0.2587	-0.0455 0.5175	0.0735 0.307	0.026 0.7114	1	
comm_focus	0.0316 0.6529	-0.0584 0.4053	-0.1703* 0.0173	0.0599 0.3938	0.0572 0.415	1

IDN:	prinobs	tch_incent	BC4GAPIL	set_directions	dev_people
prinobs	1				
tch_incentives	-0.0137 0.8165	1			
BC4GAPIL	0.1504* 0.0112	0.0402 0.5032	1		
set_directions	0.1510* 0.0133	0.0909 0.1416	0.0937 0.132	1	
dev_people	0.1261* 0.039	0.0818 0.1862	-0.0215 0.7301	0.0695 0.2571	1

Notes:

*indicates sig p <0.05

Table A4 (cont'd)

MYS:	prinobs	tch_incent	BC4GAPIL	set_directions	dev_people
prinobs	1				
tch_incent	-0.0484 0.4057	1			
BC4GAPIL	0.111 0.0556	0.1008 0.0838	1		
set_directions	-0.0705 0.2324	-0.0838 0.1575	-0.0262 0.6586	1	
dev_people	-0.0767 0.1934	0.1862 0.0016	* -0.1837 0.0018	* -0.0092 0.8765	1

MNG:	prinobs	tch_incent	BC4GAPIL	set_directions	dev_people
Prinobs	1				
tch_incent	0.0329 0.5931	1			
BC4GAPIL	0.0459 0.4579	0.0556 0.3723	1		
set_directions	0.045 0.5155	0.0391 0.5762	-0.1304 0.0612	1	
dev_people	0.0246 0.7226	0.0227 0.7452	-0.0526 0.4515	0.0907 0.1894	1

Notes:

*indicates sig p <0.05

Table A4 (cont'd)

TWN:	prinobs	tch_incent	BC4GAPIL	set_directions	dev_people	comm_focus
prinobs	1					
tch_incent	0.1836* 0.0015	1				
BC4GAPIL	-0.0899 0.1281	-0.0319 0.59	1			
set_directions	0.2219* 0.0004	0.0767 0.2296	0.0445 0.4893	1		
dev_people	0.1971* 0.0018	0.1096 0.0856	0.095 0.1388	0.1192 0.0609	1	
comm_focus	0.2144* 0.0007	-0.0592 0.354	0.1307 0.0414	* -0.0067 0.9163	0.0471 0.4603	1

THA:	prinobs	tch_incent	BC4GAPIL	dev_people	comm_focus
prinobs	1				
tch_incent	0.1455* 0.012	1			
BC4GAPIL	0.0491 0.3972	0.0664 0.2529	1		
dev_people	0.1781* 0.0023	0.174 0.003	* 0.0093 0.8748	1	
comm_focus	0.1227* 0.0365	-0.0025 0.9669	-0.0475 0.4197	0.1230* 0.036	1

Notes:

*indicates sig p <0.05

Table A4 (cont'd)

USA:	prinobs	tch_incent	BC4GAPIL	set_directions	dev_people	comm_focus
prinobs	1					
tch_incent	0.0355 0.4661	1				
BC4GAPIL	0.1087* 0.0316	-0.1653* 0.001	1			
set_directions	0.0572 0.2887	-0.0759 0.1588	0.0646 0.2354	1		
dev_people	0.0981 0.0683	0.0424 0.432	0.1553* 0.0041	0.0784 0.1455	1	
comm_focus	-0.0263 0.626	0.0501 0.3533	0.1178* 0.0301	-0.0349 0.5172	0.0196 0.7165	1

Notes:

*indicates sig p <0.05; Analysis III correlations are very similar to Analysis II

Table A5: Descriptive Statistics TRTS1 - Teacher Level

Countries	HKG		IDN		MYS		MNG		TWN		THA		USA	
Dependent Variable	*Mean*	*SE*	*Mean*	*SE*	*Mean*	*SE*	*Mean*	*SE*	*Mean*	*SE*	*Mean*	*SE*	*Mean*	*SE*
Teacher Satisfaction (tch)*	0.426	0.495	0.378	0.485	0.625	0.485	0.388	0.488	0.530	0.500	0.500	0.501	0.518	0.500
Leadership Indices														
Transactional Leadership														
Principal Observations	0.973	0.162	0.974	0.160	0.982	0.135	0.982	0.133	0.645	0.479	0.900	0.301	0.985	0.121
Teacher Incentives	0.054	0.227	0.387	0.488	0.406	0.492	0.529	0.500	0.056	0.230	0.379	0.486	0.071	0.256
Transformational Leadership														
Setting Directions	0.000	0.851	0.000	0.769	0.000	0.869	0.000	0.713	0.000	0.888	-	-	0.000	0.849
Developing People	0.000	0.821	0.000	0.874	0.000	0.768	0.000	0.670	0.000	0.814	0.000	0.839	0.000	0.817
Community Focus	0.000	0.687	-	-	-	-	-	-	0.000	0.755	0.000	0.772	0.000	0.711
Instructional Leadership (% tir	19.617	7.825	25.271	9.293	24.901	11.830	24.162	11.119	25.051	11.938	25.787	11.621	24.302	13.281
Aggregated Student Controls														
Language of Test Spoken at Home (0-1)	90.243	11.829	33.593	37.255	62.666	32.260	95.179	10.854	83.208	17.989	66.790	36.923	89.767	15.552
Mothers Education (Less than Secondary) (0-1)	0.895	0.144	0.911	0.201	0.879	0.123	0.703	0.208	0.767	0.192	0.900	0.173	0.530	0.271
Aggregated Teacher Controls														
Teacher Experience (Yrs)	13.033	9.662	12.135	7.585	11.694	8.266	16.283	10.667	12.162	8.469	14.440	9.974	12.896	9.746
Teacher Certification (0-1))	0.903	0.296	0.755	0.431	0.809	0.394	0.962	0.191	0.906	0.292	0.977	0.152	0.999	0.035
Proportion Females	0.399	0.491	0.520	0.500	0.730	0.445	0.818	0.386	0.468	0.500	0.652	0.477	0.633	0.482
Teacher Age (Yrs)	37.776	9.692	38.126	8.059	37.094	8.077	38.600	10.997	39.169	8.444	40.394	10.312	41.630	10.821
Small Class size (0-1)	0.115	0.320	0.092	0.290	0.019	0.136	0.111	0.314	0.048	0.214	0.123	0.329	0.537	0.486
School Controls														
School Size	1051.690	175.059	553.197	335.066	1428.156	686.501	1413.964	858.581	1906.202	1214.769	1341.747	1070.423	834.725	402.750
School Resources for Math (0-	0.734	0.443	0.058	0.233	0.426	0.495	0.058	0.235	0.381	0.486	0.141	0.349	0.499	0.500
Urban (0-1)	0.345	0.476	0.201	0.401	0.117	0.322	0.088	0.284	0.213	0.410	0.102	0.303	0.185	0.389
N	182		317		295		174		209		279		548	

Notes:

1. All means are unweighted and at the teacher level

*2. *The DV teacher satisfaction is a binary variable where 1= v.high/high teacher satisfaction and 0=medium/low satisfaction. Tch=teacher reported*

3. Analysis is for Math and Science teachers

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CHAPTER 3

TEACHER COLLABORATION IN INTERNATIONAL CONTEXTS: DOES TRANSFORMATIONAL LEADERSHIP PLAY A ROLE?

3.1 Introduction

This paper unpacks the types of teacher collaboration associated with a principal's transformational leadership style and then explores whether teacher engagement in a breadth of collaborative activities is associated with teacher satisfaction. Chapter 2 of this dissertation explored in detail the association between teachers' job satisfaction and principals' transformational leadership in Asia and the United States. This paper will focus on exploring the association between teacher collaboration and transformational leadership, as well as the association between collaboration and teacher satisfaction in a multi-country context.

Teacher collaboration is a term which has been previously defined as cooperative actions that take place primarily in the workplace and that relate to improving instructional practice and school outcomes (Kelchtermans, 2006). Collaboration has been credited in the literature with benefits such as providing moral support for teachers (Brundett, 1998; Bolam, McMahon, Stoll, Thomas & Wallace, 2005; Shulman, cited in Hargreaves, 1994), promoting school effectiveness (Heck & Hallinger, 2010; Moolenaar, Daly & Sleegers, 2010) and promoting teacher effectiveness via teacher reflection and teacher learning (Brundett, 1998; Cha & Ham, 2012; Hargreaves, 1994; Parise & Spillane, 2010; Youngs, 2007). Further, teacher collaboration has also been viewed by some scholars as an important prerequisite for the effective implementation of reform initiatives (Coburn, 2001). Since teachers are the agents who interpret and implement reform it stands to reason that reform initiatives are likely to be more effectively implemented in schools which have a collaborative climate.

Researchers have found that the perceived benefits of collaboration are to a large extent social and emotional. Collaboration has been linked positively in previous work to teachers' morale and sense of self-efficacy (Bolam et al, 2005; Demir, 2008; Tschannen-Moran & Hoy, 2007; Ross & Gray, 2006; Wahlstrom & Louis, 2008). Collaborative work helps teachers feel better about their jobs, their students and themselves, which in turn contributes to greater teacher commitment and job enthusiasm. Thus, collaborative activity is perceived by many scholars as being central to the decision-making process in schools as well as being an integral part of effective schooling. Indeed, it has been suggested that developing and sustaining teacher collaboration in schools is an important aspect of organizational capacity building because it enables school staff to perform their tasks more effectively by pooling knowledge and technical expertise (Cosner, 2009; Printy, 2010; Sergiovanni, 1994).

It is well-established that school leaders play an important role in establishing a school's organizational context (Parise & Spillane, 2010; Urick & Bowers, 2013). Despite wide acknowledgement of the benefits of teacher collaboration in the literature, however, there has been little systematic effort to understand the effect of leadership style on teacher collaboration particularly in a multi-country setting. In order to develop a comprehensive understanding of collaboration in the school context, it is important to go beyond the perceived benefits of collaboration and try to understand how different types of teacher collaboration vary based on leadership style, teacher demographics and school organizational characteristics.

As a systematic investigation in this direction, this study attempts to explore the hypothesis that a principal's leadership behavior can alter teachers work conditions such that teachers are empowered to engage in a breadth of different forms of collaboration. Specifically, I examine the frequency and breadth of collaboration (termed the "coll_index") within schools

situated in Europe, Central America and South America and explore how different types of collaboration are or are not associated with transformational leadership behavior in diverse country context. Additionally, my study adds to the body of literature on teacher collaboration by exploring the association between teacher collaboration and teachers' job satisfaction, which has hitherto not received much scholarly attention. Much of the previous literature on collaboration has been either focused on teacher learning or on student outcomes. Given previous evidence that the perceived benefits of collaboration are to a large extent social and emotional I argue that it is important to explore the links between teacher satisfaction, which is largely an affective reaction to workplace conditions, and teacher collaboration within the workplace.

3.2 Literature Review

During the past two decades teacher collaboration has captured the attention of scholars such as Hargreaves (1994), Little (2003), Talbert and McLaughlin (1994), Tschannen-Moran (2001; 2010) Levine and Marcus (2010) and Cha and Ham (2012) among others. These scholars posit that school-based teacher collaboration has the potential to stimulate improvement in teaching and learning, as well as to facilitate effective change within schools. In addition, based on shared reflections in the workplace, teacher collaboration provides possibilities for new models of professional development and higher teacher self-efficacy.

In the literature that follows, I first review studies on teacher collaboration, followed by a review of research on principals' transformational leadership and studies at the nexus of leadership and collaboration. Finally, I provide a brief overview of the literature on teacher satisfaction and collaboration.

3.2.1 Collaboration. The discourse on teacher collaboration is far from homogenous. Authors such as Hargreaves (1994) and Little (1990) have approached the study of teacher

collaboration as a culturally oriented phenomenon in which the beliefs, norms, and values constructed by teachers are related to their personal and professional relationships. Scholars such as Achinstein (2002) and Lortie (2002) on the other hand problematize the purpose and values underlying a given approach to teachers' work and relationships. This body of work depicts collaboration as a micro-political activity in which issues of educational goals, role expectations and power relationships are fought over and where teacher collaboration is viewed as a tradeoff between professional interdependence and individual autonomy.

Other scholars understand collaboration from the perspective of the social and professional relationships inside schools and between schools and their environments. Sergiovanni (1994) for example, posits that teachers experience a sense of interdependency and mutual obligation in schools where collaboration is fostered. He postulates a theory of community such that "schools can become places where relationships are familylike, where space and time resemble a neighborhood and where a code of values and ideas is shared" (Sergiovanni, 1994, preface, xv-xvi). Lavie (2006) also emphasizes shared goals, values, and beliefs as a necessary condition for teacher collaboration within a learning community.

Underlying the notion of a professional community is the belief that teachers benefit as professionals when they have better relationships in the workplace because they are less isolated and uncertain. Professional communities provide teachers the support they need to collaborate in sharing their practices and engaging in reflective dialogue regarding curriculum and instruction (McLaughlin & Talbert, 2001). The term "professional communities" thus exemplifies a collaborative school context where teachers share norms, values, visions and beliefs concerning their students, their teaching, and their work within an organizational culture that encourages

interdependence among members of the organization (Printy, 2008; Vescio, Ross, & Adams, 2007).

To date, much of the literature on professional learning communities has focused extensively on impact of collaboration on student achievement. Yasumoto, Uekawa, and Bidwell (1990) for example, found that when teachers in high schools organize along collegial lines within problem-solving communities, student achievement growth is intensified. Similarly, Louis and Marks (1998) documented that the presence of a professional community in a school was indicative of higher levels of social support for achievement as well as higher levels of *authentic pedagogy.*[18] More recently, Bolam, McMahon, Stoll, Thomas, and Wallace (2005) posited that better professional knowledge among teachers participating in professional learning communities tends to enhance student learning. Their survey data from 393 schools also suggests an increase in teacher collaboration and an improvement in teacher practice as a result of working in teacher learning communities. Additionally, Vescio, Ross, and Adam's (2008) review on professional learning communities suggests that such communities have a positive impact on both teaching practice and student achievement. Several of the studies they reviewed specifically referred to teachers' use of techniques (developed as a result of teacher participation in professional learning communities) such as flexibility in classroom arrangements and changes in the pace of instruction based on student mastery of the content taught. Similar support for the relationship between professional learning communities and student achievement can be found in other literature on school communities (Strahan, 2003; Supovitz, 2002; Printy, 2008; Wahlstrom & Louis, 2008).

[18] *Authentic Pedagogy* is a term developed by Louis and Marks (1998) which implies teaching that promotes higher order thinking and the development of a depth of knowledge which is intrinsically valuable.

Additionally, there is a separate stream of work on teacher collaboration that specifically focuses on the importance of trust as a resource in schools (Adams & Forsythe, 2013; Bryk & Schneider, 2003; Cosner, 2009; Daly, 2009; Tschannen-Moran, 2001). In general, this body of work posits that trust contributes to positive performance culture in schools. Tschannen-Moran (2001) for example, noted that trust is an essential prerequisite for greater collaboration within schools. Her study showed that when there was a high level of trust in parents and teachers, there was a greater likelihood of collaboration among faculty. Similarly, Cosner's (2009) qualitative study of 11 high school principals found that collegial trust was an important feature of principals' capacity-building work. Recently, Adams and Forsythe (2013) found that mean math and reading achievement were higher in schools with a stronger culture of collective faculty trust. A caveat to these findings is substantive variability[19] in trust across schools within the same school district. This large between school variance indicates that schools within a district vary considerably in their ability to generate trust among faculty, parents and students. It is therefore quite possible that variables not accounted for in this work may be mediating the trust-achievement relationship.

3.2.2 Transformational Leadership & Collaboration. The concept of transformational leadership was originally developed in the business literature as a means of transforming organizations (Bass & Avolio, 1994; Burns, 1978) and was applied to the context of schools as a strategy to support reform (Leithwood & Jantzi, 2005). In contrast to transactional leadership in which leaders attend to managerial tasks and closely monitor staff, transformational leadership according to Bass and Avolio (1994) consists of the "four *I's,*" which include *individualized consideration* (the leader creates a supportive climate and motivates workers to achieve higher

[19] Adams and Forsythe (2013) found that around forty-five percent of the variability in collective faculty trust is between schools.

potential), *intellectual stimulation* (the leader provides opportunities for creativity and staff development), *inspirational motivation* (the leader builds consensus for a shared vision and mission), and *idealized influence* (the leader acts as a role model and engages in community building). These four components of transformational leadership guide the restructuring of organizations for increased effectiveness. Leithwood and Sun (2012) further extended the conceptual framework provided by Bass and Avolio (1994) to include measures such as holding high performance expectations, strengthening the school culture, building collaborative structures to encourage staff participation in school decisions, providing a community focus and improving the instructional program.

Scholars have found that transformational leadership restructures and prepares schools for an increase in shared leadership with improved opportunities for innovation and change (Moolenaar et al, 2010; Printy, 2003). Additionally, prior research indicates that the more closely connected principals are to their teachers, the more willing teachers are to invest in change and new practices (Moolenaar et al, 2010). Schools where the teachers feel more effective are more likely to be schools where teachers share beliefs and values consistent with the central aims of the school ('inspirational motivation'- an important aspect of transformational leadership) and where they feel valued and respected (the notion of 'individualized consideration'). Thus, it may be argued that transformational leadership seeks to establish the kind of school climate necessary for teacher collaboration to flourish. This leadership style is therefore, an appropriate choice in a study of teacher collaboration.

Much of the leadership literature specifically examines the influence of principal leadership on student achievement. A major contribution of this research is the strong and significant indirect relationships (of efficacy, community, and trust) which mediate school

leadership and student learning (Dumay, Boonen, & Van Damme, 2013; Goddard, Miller, Larson & Goddard; 2010; Heck & Hallinger, 2010; Robinson, Lloyd, & Rowe, 2008; Supovitz, Sirinides & May, 2010; Youngs & King, 2002; Waters, Marzano, & McNulty, 2003; Witziers, Bosker & Kruger, 2003). Waters et al. (2003) for example, identified the fostering of shared beliefs and a sense of community and cooperation to be one of the most significant leadership predictors of student learning outcomes. In their meta-analysis, Robinson et al. (2008) concluded that instructional leadership had an impact on student achievement that was three to four times that of transformational leadership. The work of Heck and Hallinger (2010) provides additional support for the link between collaborative leadership and schools' organizational capacity to increase student outcomes.

To date, there has been comparatively less focus on the direct effect of leadership (and specifically transformational leadership) on teacher collaboration. Gumus, Bulut and Bellibas (2013), and Duyar, Gumus and Bellibas (2013) have researched the association between teacher collaboration and principals' instructional and administrative leadership. However, these studies are limited geographically in that they are single country studies that examine the association for Turkey only. It is likely that the association is different for countries in Europe. Further, Gummus et al. (2013) explore only administrative and instructional leadership styles, thus leaving room for further analysis of these relationships.

This study builds on extant literature pertaining to principal leadership in two ways. First, it explores the direct effect of transformational leadership on different types of teacher collaboration. Second, it uses principal reported measures of transformational leadership rather than teacher reported measures. Little research has been done to examine principal perceptions of their own leadership practice and how those practices generate the conditions necessary for

the growth of teacher collaboration controlling for school context and school climate (Urick & Bowers, 2013). Bowers (2013) argues that principal perceptions of leadership are important because principal perceptions and behaviors determine the extent to which school leaders shape the school environment and effect organizational change. Principals can also be instrumental in helping teachers improve their practice by supporting them and establishing an orderly school climate and through a cohesive schools' vision and mission.

3.2.3 Teacher Satisfaction and Collaboration. Organizational psychologists have long maintained that work attitudes drive employee behaviors and performance (Judge, Bono, Thoresen & Patton, 2001). If we think of the school as a workplace then teacher satisfaction (work attitude) should be associated with teacher collaboration (employee behavior). There is emerging support in the scholarly community for the notion that school cultures promoting teacher collaboration are positively associated with teacher satisfaction (Johnson, 2006; Kraft & Papay, 2011; Ladd, 2011; Liu & Ramsey, 2008). Johnson and Birkland (2003) for example, found that teachers were more likely to stay in schools with "integrated professional cultures" organized around collaborative efforts. This may be because teacher collaboration affords teachers the opportunity for professional sharing that may not otherwise occur (Woods & Weasmer, 2004).

Despite the emerging literature on the connection between teacher collaboration in schools and school improvement, there has been little systematic effort to understand the association between collaboration and teacher satisfaction. Additionally, there has been little effort to use large scale nationally representative data to explore teacher collaboration in the workplace for more generalizable results. This analysis attempts to address this gap in the literature by analyzing the association between satisfaction and a breadth of collaborative

activities across five countries participating in OECD's Teaching and Learning International Survey (TALIS 2008).

3.3 Theoretical Framework

Since the purpose of this paper is to analyze the interrelationships between teacher collaboration, transformational leadership and teacher satisfaction, I draw on the literatures on school effectiveness and school climate to provide theoretical underpinnings to this work. The school effectiveness discourse on collaboration is an appropriate choice because it highlights the centrality of the principal in developing a shared vision as well as developing consensus in practices and expectations. These are also key aspects of transformational leadership (Bass & Avolio, 1994; Leithwood & Sun, 2012).

There is also a body of literature which examines principal teacher interaction within schools, in which the importance of a clear, shared sense of vision is emphasized in the context of a strong organizational culture that holds high expectations for student and teacher performance, focuses on academic learning, and encourages discipline and order within the school (Barnett & McCormick, 2004; Price, 2012). Supportive principal leadership is a key component of this perspective. The underlying assumption is that the principal's actions set the tone of the school and shape the organizational conditions in which teachers work. Studies that adopt this theoretical stance view leadership as a powerful predictor of teacher effectiveness.

In sum, school leaders who support knowledge sharing among teachers and create internal structures that promote collaboration are most effective at fostering change within their schools (Bryk & Schneider, 2002; Parise & Spillane, 2010; Youngs & King, 2002). Based on this understanding of the relationship between leadership and collaboration, I put forward two hypotheses:

Hypothesis 1: Teachers' collaborative interaction with other teachers is more likely in schools with a more positive organizational climate where the principal chooses to exercise transformational leadership.

Hypothesis 2: Teachers who are engaged in a variety of collaborative experiences are more satisfied with their jobs than those that do not engage in different types of collaboration.

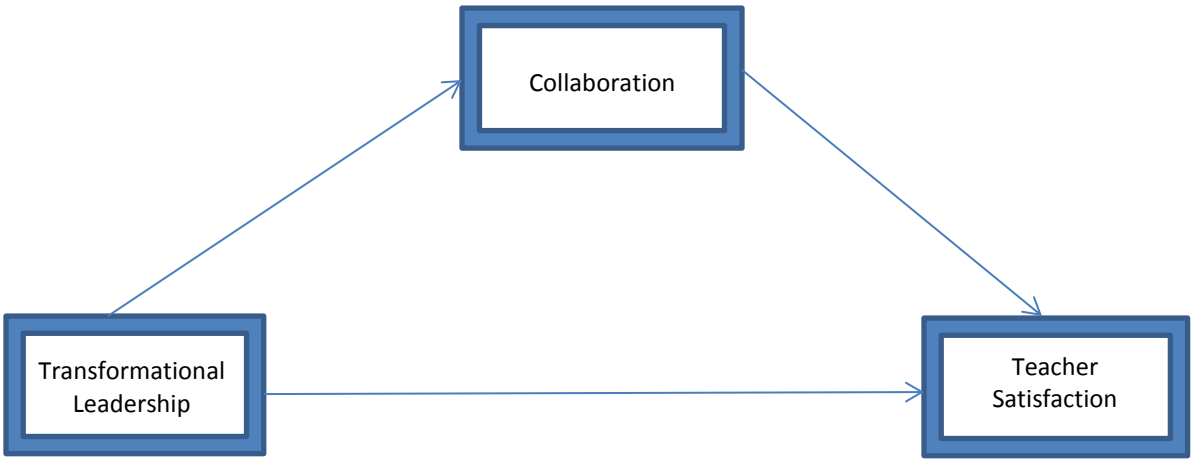

Figure 3: Conceptual Interrelationships between Transformational Leadership, Teacher Collaboration and Teachers' Job Satisfaction

Figure 3 is a conceptual diagram for the analysis proposed. Although the arrows show hypothesized directionality this should not be mistaken for causality because the analysis proposed is purely correlational in nature and indicates associations rather than causal relationships.

The remaining sections of the paper sequentially examine the country context, research questions, data and methods. This is followed by a summary of results and discussion of key

findings. Additionally, I provide a detailed look at Mexico's country context given the scale of education reform there and the breadth of work undertaken by the OECD in that country. I also discuss briefly the policy implications and limitations of this work.

The following section provides a brief description of country location, educational background and teacher satisfaction. The purpose of this information is to help the reader contextualize the results of the within country regressions in the analyses to follow. Comparative education analyses have traditionally focused on geographic entities as units of comparison (Bray, Adamson & Mason, 2007). The five countries analyzed in this paper are Denmark, Poland, Brazil, Mexico and Hungary. My rationale for selection of this subset of countries from TALIS 2008 was to have sufficient variability in terms of geographic location and the levels of teacher satisfaction in the countries of interest. Thus, two out of the five countries selected are in Central Europe (Hungary and Poland), one is located in Northern Europe (Denmark), one is in North America (Mexico) and the last is South America (Brazil). In three of these countries – Brazil, Mexico and Hungary teachers report lower levels of job satisfaction than in Denmark and Poland. Yet these five countries also have certain similarities. All the countries selected have literacy levels above 90 percent. Similarly, across four of the five countries selected the level of educational expenditure is quite similar (around five percent of the national budget). The level of educational expenditure in Denmark is slightly higher (approximately 8 percent of the budget).

3.4 Country Context[20]

3.4.1 Denmark

[20] Teacher information on all countries is obtained from TALIS 2008 overview of country results at the following URL: http://www.oecd.org/edu/school/oecdsteachingandlearninginternationalsurveytalis-briefingnotesandoverviewsofcountries.htm

3.4.11 Background. Denmark is located in Northern Europe and is a member of the European Union. Once the seat of the Vikings, Denmark has evolved into a prosperous nation. Danish is the primary language spoken though English is a predominant second language. Danes enjoy a high standard of living and the Danish economy is characterized by extensive welfare measures and an equitable distribution of income as indicated by a Gini index of 24.7 (2011)[21]. There is a high literacy rate (99%) in Denmark and the educational expenditure in Denmark is 8.9% of the GDP, which is the highest among the countries selected for analysis.

3.4.12 Teacher Characteristics. In Denmark, teacher satisfaction appears to be above the TALIS average[22] for all countries participating in TALIS 2008. Based on reports from teachers of lower secondary education and the principals of their schools, on average, teachers in Denmark view the disciplinary climate in their schools somewhat negatively. However, the percentage of lesson time lost due to disruptive student behavior or administrative responsibilities is relatively low as compared to the other TALIS countries.

Approximately 75% of teachers in Denmark participated in professional development activities during the survey period of 18 months. Teacher experience in Denmark is a little above average with 39% of teachers working for twenty years or more as compared with the TALIS average of 36%.

3.4.2 Poland

3.4.21 Background. Poland is located in Central Europe. Poland joined the European Union in 2004. It has also transformed into a democratic market economy. In the 1990's Poland's economy was considered one of the most robust in Central Europe. The official

[21] Gini index for all countries taken from https://www.cia.gov/library/publications/the-world-factbook/

[22] The score for job satisfaction (as reported by TALIS) represents the extent of agreement on average with the statement "All in all I am satisfied with my job", where strongly agree=4; agree=3; disagree=2 and strongly disagree=1. The TALIS average is between 3.1-3.2

language of the country is Polish with 97.8% of the population speaking it. The Gini index for Poland is 34.1 (2009) so it is relatively more equal than other countries like Mexico and Brazil. Poland has a literacy rate that matches that of Denmark (99.7%). Educational expenditures in Poland however, constitute 5.10% of the GDP which is somewhat lower than Denmark.

3.4.22 Teacher Characteristics: In Poland, teacher satisfaction is approximately the same as the TALIS average (which is between 3.1-3.2 on a scale from 1-4 where 4 = strong agreement with the statement that the teacher is very satisfied). Teachers in Poland have a fairly positive view of the classroom disciplinary climate. Like Denmark, the percentage of lesson time lost due to disruptive behavior or administrative demands is relatively low compared to other countries in TALIS.

Teacher participation rate in professional development over the 18 months of survey data collection was approximately the same (90%) as the TALIS average of 89%. Teacher experience (defined as 20 or more years of experience) in Poland is slightly below the average found in the TALIS countries (31% as compared to 36%). Notably, Poland has a relatively higher degree of professional collaboration than the other TALIS countries.

3.4.3 Brazil

3.4.31 Background. Brazil is located in South America and is considered a leading economic power and regional leader in South America. Portugese is the official language of the country and is widely spoken. The country is characterized by a highly unequal income distribution. The Gini index in Brazil is 51.9 (2009) and is the highest among the countries selected for analysis. Educational expenditure in Brazil constitutes 5.6% of the GDP, similar to that of Mexico.

3.4.32 Teacher Characteristics: In Brazil, teachers' job satisfaction is lower than the TALIS average. On average, teachers in Brazil have a negative opinion of the classroom disciplinary climate as compared to the other TALIS countries. The percentage of lesson time lost to disruptive student behavior or administrative commitments is the highest in Brazil of all TALIS countries.

Around 83% of teachers in Brazil participated in professional development activities in the survey period as compared to the TALIS average of 89%. The percentage of teachers in Brazil who have 20 or more years of experience is well below the TALIS average of 36%. Only 19% of Brazilian teachers have this level of experience.

Notably, the extent of instructional leadership reported is strongest in Brazil compared with the other TALIS countries. Teacher participation in professional development forms an important component of teacher appraisals in schools where instructional leadership is practiced.

3.4.4 Mexico

3.4.41 Background. Mexico was a Spanish colony until the nineteenth century. 92.7% of the population speak Spanish which is the primary language. Ongoing economic concerns include an inequitable distribution of wealth as indicated by a relatively high Gini index of 48.3 (2008). Educational expenditure in Mexico is 5.1 % of the GDP.

3.4.42 Teacher Characteristics. Teachers' job satisfaction was lower than the TALIS average. Teachers in Mexico related their overall job satisfaction not to beliefs about teaching but to other factors such as classroom climate, teacher student relations and their self-efficacy. In Mexico, teachers have a relatively good opinion of the disciplinary climate in classrooms yet correspondingly report a lower amount of time spent teaching. Notably, a large proportion of instructional time in Mexico is devoted to administrative activities.

In Mexico, 92% of teachers report participation in professional development during the 18 months preceding the survey as compared to the TALIS average of 89%. Approximately two-thirds of the teachers in Mexico have ten or more years of experience. In terms of teacher collaboration, Mexico appears to have higher than average professional collaboration.

3.4.5 Hungary

3.4.51 Background. Hungary is located in Central Europe. The country embarked on a program of economic liberalization in 1968 followed by the adoption of a free-market economy in 1990. 84.6 percent of the population in Hungary speak Hungarian. Income distribution in Hungary is relatively more equitable and the Gini index for Hungary is in the same range as that for Denmark (24.7 – 2009).

3.4.52 Teacher Characteristics. Teachers in Hungary have a rather positive view of classroom disciplinary climate. Additionally, the percentage of time lost due to disruptive student behavior or administrative responsibilities is among the lowest. Despite this, teacher satisfaction in Hungary is low compared to the other TALIS countries.

The percentage of teachers in Hungary participating in professional development activities during the survey period of 18 months is approximately the same as the TALIS average (87% versus 89%). Hungarian teachers have more years of experience than the TALIS average with 47% of teachers who have 20 or more years of experience compared with the TALIS average of 36%.

Notably, professional collaboration is relatively more frequent in Hungary as compared with other TALIS countries.

It is evident from the above review that the five countries chosen for analysis vary with respect to geographical location and the teachers in these countries display varying levels of

satisfaction with their jobs. There is also variation in terms of equitable distribution of wealth with the European countries being more equitable than either Brazil or Mexico. Nevertheless, these countries all display similar levels of educational expenditure and a high literacy level of 90 percent or greater. Table 10 on the next page provides a quick summary of this information on country context

3.5 Research Questions

The research questions are briefly stated as follows:

1. Is frequent teacher collaboration across a breadth of collaborative activities among teachers associated with transformational leadership in a multi-country context controlling for the effect of teacher demographics, principal demographics and school climate?

2. What are the kinds of collaborative activity associated with different dimensions of transformational leadership?

3. Is frequent participation in a breadth of collaborative activities associated with teachers' job satisfaction in a multi-country context?

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Table 10: Summary of Country Context - TALIS 2008

	DNK	POL	BRA	MEX	HUN
Size	43,094	312,685	8,514,877	1,964,375	93,028
Location	N.Europe	C.Europe	S. America	N.America	C. Europe
Gini Index	24.8	34.1	51.9	48.3	24.7
Education Expenditure	8.70%	5.10%	5.60%	5.30%	4.90%
Literacy	99%	99.7%	90.40%	93.50%	99%
Teacher Satisfaction	> Avg	Avg	< Avg	< Avg	< Avg
Teacher Professional Development (%)	76%	90%	83%	92%	87%
% Teacher Experience (20yrs+)	39%	31%	19%	N/A	47%

Sources:

http://www.oecd.org/edu/school/oecdsteachingandlearninginternationalsurveytalisbriefingnotesandoverviewsofcountries.htm
https://www.cia.gov/library/publications/the-world-factbook/geos/hu.html

3.6 Data

3.6.1 Sample design & weights

The OECD's Teaching and Learning International Survey (TALIS, 2008) is the first international survey to focus on teachers working conditions and the role of school leadership. As such, this data is well-suited to analyze the interrelationships between teacher satisfaction, teacher collaboration, and a principal's transformational leadership in an international context. TALIS 2008 is a cross sectional, observational, and non-experimental study. Information is available from more than 4,000 schools and 70,000 teachers. The target population for TALIS is lower secondary school teachers and principals. A minimum of 200 schools per country and 20 teachers per school were sampled. Exclusion restrictions include schools catering exclusively to special needs children or to adult education.

All the data are derived from random samples of schools and teachers. Consequently, the results of all analyses using this data hold not only for the sampled schools and teachers but for the country as a whole. To make correct inferences using the TALIS data, however, it is necessary to take into account the complex sampling structure of the data. I do this by using Stata's *svyset* command together with the brr option to generate appropriate standard errors in all the analyses.

The sampling plan for TALIS is a stratified two-stage probability sampling design. This means that the teachers (who constitute the Secondary Sampling Unit - SSU) were randomly selected from a list of teachers within each of the randomly selected schools (which constitute the Primary Sampling Unit - PSU). Each school is regarded as a cluster and all teachers are nested within these clusters. The use of appropriate sampling weights compensates for the disproportional selection probabilities of schools and teachers. Because the analysis proposed

requires data from the school as well as teacher level, school level data are added to the teacher data such that the school information becomes an attribute of the teacher. A detailed description of all the variables used in the analysis follows.

3.6.2 Description of Dependent Variables

For the first research question my dependent variable is an index measuring the frequency of teacher collaboration across different types of collaborative activity. The index was constructed in two steps. First, each of eight different collaborative activities (numbers 5-12 in table 11) were recoded as binary variables (where 1= teacher participation in collaborative activity 3-4 times/year or more frequently and 0= teacher participation less than 3-4 times/year). Next these eight measures of collaboration were averaged for each teacher using Stata's "rowmean" command. This produced fractional numbers between 0 and 1 (inclusive of 0 and 1) for each teacher, such that a fractional number closer to 1 implies more frequent collaborative activity for that teacher across a breadth of collaboration variables. The index of collaboration thus measures frequent participation in a variety of different types of collaboration. Notably, the index of collaboration contains measures of collaboration that pertain to collaboration within the school. The collaboration variables (numbers 1-4 in table 11) measuring participation in a PD network, dialogue with teachers were not included in this index because they are binary Y/N variables that simply measure participation or lack thereof in these collaborative activities. They do not measure frequent participation in a collaborative activity (unlike variables 5-12 in table 11).

For my second research question pertaining to the types of collaborative activity associated with dimensions of principal leadership, the dependent variable differs by type of collaborative activity. Thus, for each of five countries analyzed, I ran twelve within country

logistic regressions where the dependent variable for each regression was a different type of collaborative activity. These twelve collaborative activities as well as their recodes are listed in table 11.

My third research question examines the association between teacher collaboration and teachers' job satisfaction. The dependent variable for this question is binary (1= teacher satisfaction; 0=otherwise) and reflects teacher agreement with the statement "I am satisfied with my job." Teacher responses to the satisfaction question on the TALIS questionnaire were organized on a scale going from 'Strongly Disagree' to 'Strongly Agree.' However, there were very few observations in the 'Strongly Disagree' category so the variable was recoded as binary by combining the 'Strongly Disagree' and 'Disagree' categories as 0 and the 'Strongly Agree' 'Agree' categories as 1.

3.6.3 Description of Key Independent Variables

For research question 1, the key independent variables are standardized factor scores named 'factor A,' 'factor B,' and 'factor C,' indicative of a principal's transformational leadership style. These scores were obtained through an explanatory factor analysis (EFA). Table 12 lists all the variables that were used in the EFA to create the transformational leadership factor scores. These variables are consistent with Leithwood & Sun's (2012) conceptualization of transformational leadership, which is based on the Nature of School Leadership survey (NSL).[23] The Kaiser criterion (which uses the decision rule of eigenvalues greater than 1) as well as, a visual examination of the scree plot in each country were used to decide how many factors

[23] Related leadership practices – Management by exception and Contingent reward were excluded from the factor analysis because the variable BCG20F measuring the extent to which teacher bonuses were tied to evaluations has 38% missing data for Denmark. Similarly the variable BCG15C (principal observation of classrooms where 1=very often and 0=not very often) has only 18% in the 'very often' category.

Table 11: Types of Teacher Collaboration

No.	Variable Name	Variable Desciption /Recode
1	pd_network	Teacher participation (over past 18 mo) in a network put together specifically for teacher professional development (1=Y; 0=N)
2	collab_research	Teacher participation in collaborative research on a topic of interest (1=Y; 0=N)
3	mentoring_coaching	Teacher participation in mentoring, peer observation, and coaching as part of a formal school arrangement (1=Y; 0=N)
4	dialogue_tchg	Teachers engage in informal dialogue on how to improve teaching (last 18 mo) (1=Y; 0=N)
5	coll_textbook	Frequency with which teachers discuss & decide on selection of textbooks (1=3-4 times/yr or more; 0=less than 3-4 times/yr)
6	tchg_materials	Frequency with which teachers exchange teaching materials with colleagues (1=3-4 times/yr or more; 0=less than 3-4 times/yr)
7	team_conf	Frequency with which teachers attend team conferences for age group taught (1=3-4 times/yr or more; 0=less than 3-4 times/yr)
8	discuss_learning	Frequency with which teachers engage in discussions about learning (1=3-4 times/yr or more; 0=less than 3-4 times/yr)
9	team_tchg	Frequency with which teachers teach jointly as a team in the same class (1=3-4 times/yr or more; 0=less than 3-4 times/yr)
10	obs_feedback	Frequency with which a teacher observes another teacher's class and offers feedback ((1=3-4 times/yr or more; 0=less than 3-4 times/yr)
11	joint_activities	Frequency with which a teacher engages in joint activities with other teachers across different classes and age groups (1=3-4 times/yr or more; 0=less than 3-4 times/yr)
12	hw_practice	Frequency with which teachers engage in homework practice across subjects ((1=3-4 times/yr or more; 0=less than 3-4 times/yr)

Table 12: List of Variables Used in EFA for Transformational Leadership Indices – TALIS 2008 [24]

No.	Leadership Practices	Variable Name	Variable description[25]
1.	Inspirational Motivation	staff_goals	The principal defines goals to be accomplished by the staff of the school
		curr_clarity	The principal ensures clarity concerning the responsibility for coordinating the curriculum
2.	Hold High Performance Expectations	monitor_stuwork	The principal monitors student work
		enforce_goals	The principal ensures that teachers work according to the school's educational goals
3.	Provide Individual Support	discuss_probs	The principal takes initiative to discuss problems with teachers when a teacher has problems in his/her classroom
		Induction	The principal provides for a formal induction process for a beginning teacher at his school
4.	Provide Intellectual Stimulation	upgrade_skills	The Principal informs teachers about opportunities to upgrade their skills
5.	Strengthening School Culture	disruptive_class	Principal pays attention to disruptive behavior in classrooms
		cl_issues	principal and teachers solve classroom problems together
		pd_schgoals	Principal ensures that the pd activities of teachers are in accordance with teaching goals of school
		Schorder	An important part of my job is to create an orderly atmosphere in the school.
6.	Building Collaborative Structures	sch_devplan	Principal and teachers work jointly on goals and a school development plan
7.	Engaging Parents	parent_outreach	The principal feels it is an important part of his job to present new ideas to parents in a convincing way
8.	Focus on instructional development	tch_skills	Principal gives teachers suggestions as to how to improve their teaching
		stimulate_task	Principal ensures a task-oriented atmosphere is fostered in the school
		Prinobs	Principal observes instruction in classrooms

[24] All variables for EFA were selected based on Leithwood and Sun's (2012) conceptualization of transformational leadership.

[25] All variables are principal reported measures of leadership practices and are therefore at the school level.

should be retained. Additionally, a cutoff of .30 for the factor loadings was used for inclusion. Three factors were identified via this method – factor A, factor B, and factor C. Regression factor scores were then computed for each factor using STATA's 'predict' command.

The factor scores (A, B, & C) thus identified did not all load for each country. However, each factor loaded on at least two of the countries in the analysis. For example, factor A loaded on Denmark, Poland and Brazil. Factor B loaded on Denmark, and Mexico. Factor C loaded on Poland and Hungary. Individual factor loadings for each country as well as the percent of variance explained by each factor are shown in table 13 below.

Table 13: Factor Loadings for Transformational Leadership Indices - TALIS 2008

	DNK		POL		BRA	MEX	HUN
Variable Names	A	B	A	C	A	B	C
pd_schgoals	**0.58**		**0.80**		**0.62**		
enforce_goals	**0.72**		**0.81**		**0.62**		
upgrade_skills	**0.48**						
schorder		**0.45**				**0.49**	
stimulate_task		**-0.38**				**-0.68**	
sch_devplan		**-0.64**				**-0.48**	
parent_outreach		**0.42**					
discuss_probs				**0.58**			**0.66**
disruptive_class				**0.40**			**0.47**
cl_issues				**0.69**			**0.61**
Eigenvalue Factor	1.76	1.01	1.61	1.41	1.87	1.88	1.74
Proportion Variance	0.55	0.32	0.41	0.36	0.63	0.54	0.53
Cumulative Variance	0.87		0.77		0.63	0.82	0.82
N	112		161		329	179	171

Table 13 shows that factor A consists of three variables – pd_schgoals (The principal ensures that teacher PD is in accordance with th e teaching goals of the school), enforce_goals (The principal ensures that teachers work according to the school's educational goals), and upgrade_skills (The principal informs teachers about the possibilities for updating their knowledge and skills). These three variables appear to measure staff development consistent

with school goals. Factor B consists of four variables that appear to pertain to the principal's role in establishing a positive school climate. Factor B includes the variables schorder (An important part of my job is to create an orderly atmosphere in the school), stimulate_task (The principal ensures a task-oriented atmosphere is fostered in the school), sch_devplan (The principal and teachers work jointly on goals /a school development plan), and parent_outreach (The principal feels it is an important part of his job to present new ideas to parents in a convincing way). Factor C consists of three variables that are all classroom focused. These include discuss_probs (The principal takes initiative to discuss problems with teachers when a teacher has problems in his/her classroom), disruptive_class (Principal pays attention to disruptive behavior in classrooms), and cl_issues (principal and teachers solve classroom problems together). Factor C appears to measure the principal's role in maintaining order and discipline in the school.

Table 14 below shows standardized reliability coefficients for the three factors indicative of transformational leadership. Cronbach's Alpha for these factors is between 0.57 and 0.73 across all the countries.

Table 14: Scale Reliability Coefficient (Cronbachs Alpha) for Factor Scores of Transformational Leadership – TALIS 2008

	Factor A	Factor B	Factor C
DENMARK	0.6339	0.5711	-
POLAND	0.7293	-	0.5955
BRAZIL	0.6918	-	-
MEXICO	-	0.6075	-
HUNGARY	-	-	0.6135

For research question 2 the key independent variables are the same as for research question 1, namely the transformational leadership factor scores. The key independent variable

for question 3 is the index of teacher collaboration constructed as the dependent variable in question 1.

3.6.4 Description of Controls

School controls include principal demographic variables such as principal gender which is recoded as a binary variable where 1=female; 0=male and principal experience in years recoded as a binary variable such that 1=principal experience greater than or equal to 10 years and 0=principal experience less than 10 years. The variable 'public' is a binary variable that is =1 if the school is a public school and it is = 0 if the school is a private school. 'langdiff' represents the percentage of students whose first language differs from the language of instruction such that 1=less than 10%; 2=more than 10% but less than 20%; 3=20% or more but less than 40%; 4=40% or more but less than 60%; 5=60% or more. 'langdiff' is calculated by TALIS at the school level as the mean of these response categories rather than the percentages that they are meant to represent. 'hpareduc' is a measure of parent education which has been recoded as a binary variable such that 1= 60% or more of the class has at least one parent who is educated to the level of ISCED 5 (higher secondary) or more.

Additionally, there are some school climate controls such as 'lackpers', 'autcurr', BTG41B and BTG08C. The index 'lackpers' is constructed by TALIS to indicate a lack of school personnel. Component variables in 'lackpers' include lack of teachers (BCG29A); laboratory technicians (BCG29B); instructional support personnel (BCG29C) and other support personnel (BCG29D). A high value on this index is indicative of high levels of inadequacy with respect to support staff in the school. The index 'autcurr' was derived from a principal component analysis by TALIS and consists of three items measuring teacher autonomy with respect to curriculum. These items are choosing which textbooks are to be used (BCG31);

determining course content (BCG31K) and deciding which courses are offered (BCG31K). Higher values on the index indicate relatively higher levels of school responsibility in this area (The index ranges from approximately -1 to 1 across the countries analyzed). Cronbach's Alpha is acceptable or good for all measures of autonomy (TALIS 2008, Technical Report).The variable BTG41B is a continuous variable indicating the percentage of class time spent maintaining discipline in the classroom. The variable BTG08C is a continuous variable indicating the number of hours spent by teachers per week in administrative duties and clerical paperwork. The rationale for inclusion is the reasoning that more time spent on clerical work implies less time available to the teachers for collaborative work.

There are in addition a couple of demographic teacher controls such as 'teacher gender' (tfem) which equals one if teacher is female and 0 otherwise and 'teacher experience' which is recoded such that the texps =1 if the teacher has over 10 years of experience and 0 otherwise. The variable 'tefficacy2' reflects teacher concurrence with the statement "If I try really hard I can make progress with even the most difficult and unmotivated students." This variable was recoded as binary (1=SA/A; 0=D/SD).

Table 15 provides a complete list of all of the variables used in the analyses to follow as well as the respective levels (teacher or school) at which they were administered in the TALIS survey. Table 16 shows descriptive statistics for the same.

Table 15: List of Variables Used in Analyses - TALIS 2008

VARIABLE NAME	DESCRIPTION	LEVEL
DV:		
tsatis	Teacher Satisfaction with Job (1= satisfied)	Teacher
Index of Teacher Collaboration	Summative index of 8 collaboration variables	Teacher
pd_network	Teacher participation (over past 18 months) in a network put together specifically for teacher professional development	Teacher
collab_research	Teacher participation in individual or collaborative research on a topic of interest	Teacher
mentoring_coaching	Teacher participation in mentoring/peer observation and coaching as part of a formal school arrangement	Teacher
dialogue_tchg	Did you engage in informal dialogue with colleagues on how to improve your teaching in the past 18 months?	Teacher
coll_textbook	How often do you discuss and decide on the selection of instructional media (textbooks)	Teacher
tchg_materials	Frequency exchange teaching materials with colleagues	Teacher
team_conf	Frequency attend team conferences for age group taught	Teacher
discuss_learning	Frequency engage in discussion about the learning development of specific students	Teacher
team_teaching	Frequency teach jointly as a team in the same class	Teacher
obs_feedback	Frequency teacher observes other teachers' classes and provide feedback	Teacher
joint_activities	Frequency teacher engages in joint activities across different classes and age groups (e.g. projects)	Teacher
hw_practice	Frequency discuss and coordinate homework practice across subjects	Teacher

Table 15 (cont'd)

VARIABLE NAME	DESCRIPTION	LEVEL
Factor A	Factor score measuring transformational leadership	School
Factor B	Factor score measuring transformational leadership	School
Factor C	Factor score measuring transformational leadership	School
CONTROLS:		
School Climate Controls:		
BTG08C	No. of hours spent in administrative duties, and clerical, paperwork as a teacher	Teacher
BTG41B	% class time spent maintaining discipline in the classroom	Teacher
lackpers	TALIS index of lack of personnel in school	School
autcurr	TALIS index of curriculum autonomy	School
Teacher Controls:		
tfem	Teacher Gender	Teacher
texp	Teacher experience in years	Teacher
tefficacy	If I try really hard I can make progress with even the most difficult and unmotivated students	Teacher
School Controls:		
prinfem	Principal gender	School
prinexp	Principal experience	School
public	Is school public/private?	School

Table 16: Descriptive Statistics for Analysis on Teacher Collaboration – TALIS 2008

Countries	**DNK**		**POL**		**BRA**		**MEX**		**HUN**	
Dependent Variable	*Mean*	*SE*	*Mean*	*SE*	*Mean*	*SE*	*Mean*	*SE*	*Mean*	*SE*
Teacher Satisfaction (0-1)	0.90	0.00	0.93	0.00	0.84	0.01	0.90	0.00	0.81	0.01
Index of Collaboration	0.73	0.00	0.56	0.00	0.49	0.01	0.73	0.00	0.45	0.00
Collaboration Variables										
PD Network	0.46	0.01	0.63	0.01	0.24	0.01	0.46	0.01	0.45	0.01
Collaborative Research	0.55	0.01	0.41	0.01	0.55	0.01	0.55	0.01	0.16	0.01
Mentoring/Coaching	0.18	0.01	0.69	0.01	0.50	0.01	0.18	0.01	0.47	0.01
Dialogue about Teaching	0.91	0.01	0.96	0.00	0.95	0.00	0.91	0.01	0.79	0.01
Textbook Selection/Discussion	0.81	0.01	0.09	0.00	0.20	0.01	0.81	0.01	0.07	0.00
Teaching Materials	0.93	0.01	0.73	0.01	0.62	0.01	0.93	0.01	0.67	0.01
Team Conferences	0.93	0.01	0.76	0.01	0.76	0.01	0.93	0.01	0.75	0.01
Discuss Student Learning	0.87	0.01	0.94	0.00	0.87	0.01	0.87	0.01	0.68	0.01
Team Teaching	0.88	0.01	0.46	0.01	0.42	0.01	0.88	0.01	0.12	0.01
Joint Activities	0.64	0.01	0.58	0.01	0.52	0.01	0.64	0.01	0.45	0.01
Homework Practice	0.57	0.01	0.45	0.01	0.40	0.01	0.57	0.01	0.55	0.01
Transformational Leadership Indices										
Factor A	-0.02	0.05	-0.02	0.09	-0.02	0.04	-0.02	0.05	-	-
Factor B	0.03	0.04	-	-	-	-	0.03	0.04	-	-
Factor C	-	-	0.06	0.04	-	-	-	-	0.04	0.03
School Controls										
Principal Gender (Female)	0.36	0.02	0.69	0.02	0.75	0.02	0.36	0.02	0.48	0.03
Principal Experience	0.62	0.03	0.30	0.02	0.22	0.01	0.62	0.03	0.37	0.02
Public	0.73	0.01	0.93	0.01	0.85	0.01	0.73	0.01	0.83	0.02
Language Difference	1.40	0.05	1.92	0.02	1.41	0.01	1.40	0.05	1.13	0.01
Parent Education	0.48	0.03	0.09	0.01	0.09	0.01	0.48	0.03	0.14	0.01

Table 16 (cont'd)

Countries	DNK		POL		BRA		MEX		HUN	
	Mean	*SE*	*Mean*	*SE*	*Mean*	*SE*	*Mean*	*SE*	*Mean*	*SE*
School Climate										
Index Lack of School Personnel	-0.73	0.03	-0.74	0.03	0.40	0.05	-0.73	0.03	-0.36	0.04
Index Teacher Autonomy	0.77	0.02	-0.26	0.04	0.03	0.04	0.77	0.02	0.63	0.02
% Time Spent on Administration	3.87	0.12	3.24	0.05	3.23	0.21	3.87	0.12	5.18	0.10
% Time on Classroom Disruption	11.94	0.25	9.03	0.12	17.75	0.26	11.94	0.25	9.99	0.14
Teacher Controls										
Teacher Gender (Female)	0.57	0.01	0.75	0.00	0.73	0.02	0.57	0.01	0.77	0.01
Teacher Experience	0.52	0.01	0.60	0.01	0.49	0.02	0.52	0.01	0.74	0.01
Teacher Efficacy	0.19	0.01	0.20	0.01	0.23	0.01	0.19	0.01	0.07	0.00
N	1021		2188		3302		2034		2141	

Notes:

1. Brr Standard Errors
2. All descriptive statistics are weighted
3. The range for the index measuring a lack of school personnel ranges from -1 to 1.

3.7 Method

3.7.1 Method – Research Question 1

Research Question 1: Is frequent teacher collaboration across a breadth of collaborative activities among teachers associated with transformational leadership in a multi-country context controlling for the effect of teacher demographics, principal demographics, school background and school climate? In order to address the first question I constructed an index of collaboration (described in the previous section) and then regressed this index of collaboration on factor scores measuring dimensions of transformational leadership. The index of collaboration is a summative index that takes on fractional values in the unit interval such that $y_i \in [0,1]$. Given that the index takes on values between [0, 1] inclusive of [0, 1] I use a fractional response model developed by Papke and Wooldridge (1996) rather than a logistic regression. The Fractional response model (FRM) overcomes several of the problems encountered when other methods are used with fractional response variables. Logistic regressions for example would require arbitrary adjustment for all observations that are not either 0, or 1. The coefficients in the FRM model cannot be interpreted as marginal effects or slopes. However, the sign and significance of the coefficients will be the same as the sign and significance of the marginal effects evaluated at the mean value of the independent variables. Because of this, and the difficulty of interpreting changes in some of the independent variables (factor scores), the sign and significance of the association between the independent and dependent variables are the results of interest here (Table 17).

The FRM is a quasi-maximum likelihood estimation (QMLE) method. The binomial GLM variance assumption required for a generally robust inference may be fulfilled in STATA

by specifying a binomial distribution family and a logit link function[26]. The model specification is given below.

$$coll\_index_i = \delta + \beta_1 (\text{factor A}) + \beta_2 (\text{factor B}) + \beta_3 (\text{factor C}) + \boldsymbol{S\beta_4} + \boldsymbol{SC\beta_5} + \boldsymbol{T\beta_6} + \varepsilon \quad [1]$$

where the dependent variable coll_index is an index measuring the breadth of teacher collaboration and taking on values between 0 and 1. β_1 is a factor score measuring principals' transformational leadership. β_2 is a second factor score for transformational leadership. β_3 is a third factor score for transformational leadership. For any given country at most two of the three factor scores load. Table 14 provides a detailed look at the factor loadings for each country. $\boldsymbol{S}$ is a vector of school controls such as principal gender and experience, whether the school is public or private, whether the language of instruction is different from the language spoken at home and parents' education level (ISCED 5 or more for at least 1 parent). $\boldsymbol{SC}$ is a vector of school climate which includes an index measuring a shortfall in school personnel, level of curricular autonomy among teachers, percent of time spent by teachers quelling classroom disruption and percent of time spent by teachers in administrative tasks. $\boldsymbol{T}$ is a vector of teacher controls such as teacher gender, teacher experience and teacher efficacy. Since teacher age and experience were found to be highly collinear, only teacher experience is used in all regressions.

3.7.2 Method – Research Question 2

Research Question 2: Specifically, what are the kinds of collaborative activity that are associated with different dimensions of transformational leadership? In order to identify the kinds of collaboration associated with the factor scores indicative of transformational leadership in this analysis (namely factor A, factor B, and factor C), I ran twelve separate logistic regressions per country with a different dependent variable each time measuring some form of

[26] In stata the code for a fractional response model (FRM) is glm y x1….xk fam(bin) logit(link) vce(robust)

teacher collaboration (see table 16 for a list of all the collaboration variables used as dependent variables). I used Stata's svy brr prefix to compensate for the complex survey structure of TALIS and to adjust for the clustering of teachers within schools. Since the dependent variables measuring type of collaboration were binary, the logistic specification seemed an appropriate choice. Model 2.1 shows the first of these twelve regressions. Models 2.2-2.12 are not shown in the interest of parsimony.

$$Odds\ (Y=1) = e^{\alpha + \beta_1(factor\ A) + \beta_2(factor\ B) + \beta_3(factor\ C) + \boldsymbol{S}\beta_4 + \boldsymbol{SC}\beta_5 + \boldsymbol{T}\beta_6} \quad [2.1]$$

In the first model Y measures teacher participation (over the course of the past 18 months) in a network of teachers formed specifically for the professional development of teachers. β_1 is one of three factor scores created using Exploratory Factor Analysis measuring principals' transformational leadership. β_2 is the second factor score for transformational leadership. β_3 is a third factor score for transformational leadership. $\boldsymbol{S}$ is a vector of school controls such as principal gender and experience, whether the school is public or private, whether the language of instruction is different from the language spoken at home and parents' education level (ISCED 5 or more for at least 1 parent). $\boldsymbol{SC}$ is a vector of school climate which includes an index measuring a shortfall in school personnel, level of curricular autonomy among teachers, percent of time spent by teachers quelling classroom disruption and percent of time spent by teachers in administrative tasks. $\boldsymbol{T}$ is a vector of teacher controls such as teacher gender, teacher experience and teacher efficacy.

3.7.3 Method – Research Question 3

Research Question 3: Is participation in a breadth of collaborative activities associated with high teacher job satisfaction in a multi-country context?

For my third research question, I created a binary variable measuring teacher satisfaction where 1 is indicative of teacher agreement with the statement "I am satisfied by my job" and 0 is indicative of disagreement with this statement. A description of this variable is provided under section 3.6.2. This measure of teacher satisfaction was regressed on the index of collaboration[27] controlling for a range of school, school climate and teacher demographic variables associated in the literature with teacher satisfaction. Since my dependent variable for this question is binary, I used logistic regression with Stata's svy brr prefix to compensate for the complex survey structure of TALIS and to adjust for the clustering of teachers within schools. This clustering implies that teacher responses within schools are more similar than teacher responses across schools, which violates the OLS assumption of independence and therefore needs to be addressed. The logistic model specification used for research question 3 is shown below.

$$Odds\ (Y=1) = e^{\alpha + \beta_1 (coll\_index) + \boldsymbol{S}\boldsymbol{\beta}_2 + \boldsymbol{SC}\boldsymbol{\beta}_3 + \boldsymbol{T}\boldsymbol{\beta}_2} \quad [3]$$

In the above equation, Y is a binary variable measuring teacher perceptions of teachers' job satisfaction. $coll\_index$ is an index that measures the richness of teacher collaboration across a breadth of collaborative activities. $\boldsymbol{S}$ is a vector of school controls such as whether the school is public or private, whether the language of instruction is different from the language spoken at home and parents' education level (ISCED 5 or more for at least 1 parent). $\boldsymbol{SC}$ is a vector of school climate variables which include the level of curricular autonomy among teachers, percent of time spent by teachers quelling classroom disruption and percent of time spent by teachers in administrative tasks. $\boldsymbol{T}$ is a vector of teacher controls such as teacher gender, teacher experience and teacher efficacy.

[27] Also self-created. See section 3.6.2

The next section provides a detailed look at the results of these analyses. Tables 17 - 23 summarize these results. I organize a discussion of results by research questions and by country within each research question.

3.8 Results & Discussion

3.8.1 Results – Research Question 1

3.8.11 Denmark. Table 17 shows results for the association between the index of teacher collaboration and principals' transformational leadership. We do not observe a consistently positive relationship across countries between the factor scores measuring transformational leadership and the summative index measuring breadth of teacher collaboration in the countries being analyzed. What we do see however is that teacher efficacy is consistently and positively associated with teacher participation in collaborative activity.

In Denmark, the principal's role in staff development consistent with the schools goals as embodied by factor A is not significantly associated with a breadth of teacher collaboration. However, teaching in a public school is positively associated with the index of collaboration. As expected, the percentage of class time spent maintaining discipline is negatively associated with frequent collaboration. Presumably, the teacher has less time available for collaborative activities in a situation where much of the teacher's energy is taken up maintaining discipline in class. Additionally, female teachers in Denmark are more likely to engage in a breadth of collaborative activities than male teachers. Frequent collaboration across a breadth of collaboratively activities is positively and significantly associated with teacher efficacy ($p<0.01$).

3.8.12 Poland. In Poland on the other hand, the principal's role in pursuing goal driven staff development (Factor A) is positively and significantly associated with the index of collaboration ($p<0.05$). Teaching in a public school is also positively associated with the index of

collaborative activity. Notably, female teachers are more likely to engage in a breadth of collaborative activities than male teachers. Teacher efficacy in Poland as in the other countries is positively associated with teacher participation in a breadth of collaborative activities. There is a positive relationship between percent time spent disciplining the class and the index of collaboration which does not at first glance make intuitive sense. Perhaps teachers in Poland tend to engage in conversations with colleagues more when they face disciplinary issues in the classroom.

3.8.13 Brazil. In Brazil, the transformational leadership factor (factor A which seems to measure staff development consistent with school goals) is negatively associated with the index of collaborative activity. Taking country context into account, we know that in Brazil principals seem to display strong instructional rather than transformational leadership. Thus, the coefficient on factor A may just be capturing the lack of transformational leadership in Brazil. Teachers in Brazil spend a higher percent of class time maintaining discipline than in other countries (We know from table 16 that this number is 17 percent on average). Nevertheless, the data show a positive association between time spent maintaining discipline and collaboration. It is possible that teachers collaborate with one another over classroom management to address this discipline problem in the schools where they work. Being female and having a high sense of teacher efficacy are both positively and significantly associated with frequent teacher participation in a breadth of collaborative activities.

3.8.14 Mexico. In Mexico, principals' role in developing a positive school climate through reaching out to the parents and working jointly with the teachers on creating a school development plan seems to matter for the index of collaboration in schools. We see a positive and statistically significant association between factor B and the index of collaboration.

Additionally, teacher experience and teacher self-efficacy are both positively associated with the index of collaboration ($p<0.05$ and $p<0.001$ respectively).

3.8.15 Hungary. Hungary is the only country where there is not a significant association between a transformational leadership factor and the index of collaboration. It is also the only country in the analysis where principal experience is positively associated with teacher collaboration. The variable language difference is also positively associated with teacher collaboration. This variable represents the percentage of students whose first language differs from the language of instruction such that 1=less than 10%; 2=more than 10% but less than 20% and so on. From table 16 we see that the average value of the response categories for this variable is 1.13. This indicates that approximately 10% of students in Hungarian schools speak a language different from the language of instruction. Presumably, a more diverse group of students in class catalyzes collaboration across classes. Although percent of time spent by Hungarian teachers maintaining order in the classrooms is among the lowest of all TALIS countries, there is a significant negative association between time spent on disciplinary actions and teacher participation in a breadth of collaborative activities. As in the other countries, female teachers who are more experienced and teachers with a sense of self-efficacy are more likely to engage in a breadth of collaborative activity.

3.8.16 Summary of Results – RQ1. Results of the association between transformational leadership and the index of teacher collaboration vary by country. Across countries, school factors appear to be less important than teacher variables. Two teacher specific characteristics that seem to matter consistently for participation in a breadth of collaborative activity across contexts in addition to school leadership are a strong sense of teacher efficacy and teacher

Table 17: Table of Results for Collaboration Index and Transformational Leadership

Index of Collaboration (DV)	DNK	POL	BRA	MEX	HUN
Transformational Leadership					
Factor A	0.051	0.058**	-0.056*		
	(0.041)	(0.029)	(0.032)		
Factor B	0.091**			0.072*	
	(0.044)			(0.039)	
Factor C		-0.012			0.056
		(0.033)			(0.050)
School Controls					
Principal Gender (Female)	0.010	0.030	0.065	0.094	0.086
	(0.077)	(0.056)	(0.076)	(0.069)	(0.055)
Principal Experience	0.102	0.069	-0.091	-0.088	0.108**
	(0.077)	(0.060)	(0.073)	(0.064)	(0.055)
Public	0.581***	0.266**	-0.036	-0.075	-0.115
	(0.098)	(0.127)	(0.136)	(0.115)	(0.081)
Language Difference	-0.018	-0.051	0.129*	0.122*	0.219***
	(0.034)	(0.057)	(0.076)	(0.069)	(0.081)
Parent Education	-0.114	0.074	-0.057	0.131	0.042
	(0.073)	(0.135)	(0.125)	(0.128)	(0.071)
School Climate					
Index Lack of School Personnel	-0.153***	-0.018	0.008	-0.000	0.011
	(0.057)	(0.033)	(0.034)	(0.034)	(0.030)
% Time on Classroom Disruption	-0.005*	-0.012***	-0.008***	-0.001	-0.004**
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Teacher Controls					
Teacher Gender (Female)	0.116**	0.222***	0.209***	-0.004	0.130**
	(0.053)	(0.051)	(0.040)	(0.041)	(0.053)
Teacher Experience	0.069	0.037	0.045	0.104**	0.127***
	(0.056)	(0.042)	(0.036)	(0.046)	(0.049)
Teacher Efficacy	0.281***	0.293***	0.289***	0.250***	0.444***
	(0.071)	(0.045)	(0.048)	(0.039)	(0.077)
Constant	0.399***	-0.083	-0.333*	-0.550***	-0.578***
	(0.150)	(0.178)	(0.186)	(0.208)	(0.128)
N	1,257	2,606	4,170	2,681	2,440

Notes:

1. All numbers reported are coefficients from an FRM. 2. Numbers in parentheses represent standard errors

3. Significance is given by p<0.01 ***; p<0.05 **; p<0.10*

gender. The association between teacher gender (female) and collaboration as well as teacher efficacy and collaboration is positive and significant across countries.

3.8.2 Results – Research Question 2

My second research question unpacks the type of collaborative activity (there are 12) associated with aspects of transformational leadership. Results for this analysis are shown in tables 18-22 by country.

3.8.21 Denmark. In Denmark, the transformational leadership factor score (factor A) is positively and significantly ($p<0.01$) associated with collaborative activity that focuses on the core task of teaching. Specifically, the odds of teacher collaboration related to an exchange of teaching materials between teachers, teacher discussions about improving student learning, team teaching, as well as, peer observation of classes and feedback on teaching are greater when the principal engages in staff development connected with school goals (factor A). Teacher participation in a network, collaborative research, mentoring and holding a dialogue about teaching is not significantly associated with factor A.

The transformational leadership factor (factor B) which appears to relate more to the principal's role in strengthening school culture is positively and significantly associated with teacher participation in team conferences, team teaching, teacher discussions about student learning, teacher willingness to teach a class jointly and frequent teacher coordination of homework practices across subjects.

The odds of participating in a professional development network, engaging in collaborative research, engaging in an informal dialogue about improving teaching, and frequently coordinating homework practices across subjects are higher in Denmark if the principal is a female. Conversely, the odds of teacher participation in discussion around the

selection of textbooks, exchange of teaching materials, participation in team conferences and engagement in discussions on student learning are lower if the principal is female. When the principal is more experienced, the odds of teacher participation in more instruction focused tasks such as engaging in dialogue about teaching, selecting textbooks, and teaching the same class jointly are higher. Teachers are also more likely to engage in collaborative research, mentoring and coaching. For eight out of the twelve models the odds of teacher participation in activities focused on student learning and instruction/teaching are higher if the teacher teaches in a public school. With respect to school climate, teachers in Denmark have lower odds of collaboration if percent of time spent managing classroom disruptions goes up. This makes sense particularly in the case of time-intensive activities such as frequently holding joint activities with other teachers across classes/ages, and frequently coordinating homework across subjects. Finally, the odds of teacher participation in ten of the twelve collaborative activities are higher if teacher efficacy is high.

3.8.22 Poland. In Poland the odds of participation in eight of the twelve different types of collaborative activity are higher when the principal exercises transformational leadership (factor A). Factor A has a significant positive association with teacher participation in collaborative research, dialogue about teaching, textbook selection, team conferences, discussion about learning, teacher classroom observation and feedback, and coordinating homework across subject areas. Factor C which appears to capture classroom management by the principal and teacher working together is significantly associated with only two types of collaborative activity – teacher participation in a professional development network and teacher participation in collaborative research.

The odds of teachers participating in a teaching network, collaborative research, mentoring/coaching, team conferences, and opportunities for teachers to observe and provide feedback to other teachers are higher if the teacher teaches in a public school in Poland. There is a positive and significant relationship between all twelve types of collaboration and the percentage of time spent by teachers on administrative tasks. The odds of participation are lower for ten out of the twelve types of collaboration when the teachers spend more time on classroom disruptions. Female teachers in Poland are more likely to engage in a breadth of collaborative activities and the odds of participation in ten out of twelve types of collaboration are higher when the teachers have high self-efficacy.

3.8.23 Brazil. In Brazil, the factor (factor A – staff development organized around school and teaching goals) measuring transformational leadership is negatively associated with teacher participation in collaborative activities pertaining to instructional matters such as teacher exchange of teaching materials, team conferences, discussions about learning, and teacher observation/feedback of another teachers classroom.

The odds of teacher participation in 11 of the 12 collaborative activities are higher when the number of hours spent by a teacher per week on administrative tasks increases. Since administration involves working with people, this is not entirely surprising. This result is consistent with what we observe in Poland. The percent of time spent by Brazilian teachers on managing classroom disruptions is negatively associated with teacher participation in collaborative activities. This is consistent with the fact that the percentage of lesson time lost to disruptive student behavior in Brazil is the highest of all TALIS countries.

The odds of participation in a professional development network, informal dialogue about teaching, exchanging teacher materials, participating in team conferences, discussing learning,

team teaching and teaching classes jointly are higher in Brazil if the teacher is female. Additionally, teacher efficacy is positively and significantly ($p<0.01$) associated with all twelve types of teacher collaboration.

3.8.24 Mexico. In Mexico, the transformational leadership factor (factor B) which appears to relate more to the principal's role in strengthening school culture is positively and significantly associated with teacher participation in mentoring, informal dialogue in teaching, selection of textbooks, team conferences, and teacher discussions about learning. Mexican teachers teaching in public schools have higher odds of engaging in dialogue about teaching, and participating in team conferences. The odds of teacher collaboration increase in Mexico when the percent of students whose first language is different from the language of instruction goes up. Presumably, this catalyzes teachers to pool their resources about how to handle language barriers in the classroom. Similar to Poland and Brazil, the number of hours spent on administrative tasks by teachers in Mexico is significantly and positively associated with nine of the twelve collaborative activities. Finally, the odds of participation in all but one of the types of collaborative activity are higher with high teacher efficacy.

3.8.25 Hungary. In Mexico, the transformational leadership factor (factor C) which appears to relate more to the principal's joint role with the teacher with respect to classroom management is positively and significantly associated with teacher participation in textbook selection, team conferences, discussions about learning, and teaching a class jointly. Factor C is negatively associated with teacher participation in professional networks, and mentoring. In Hungary the odds of participation in collaborative activity are also significantly and positively associated with principal experience (more than 10 years). There is also a positive and significant association between the number of hours per week spent on administrative duties and

participation in nine of the twelve types of collaboration. For eight out of the twelve collaborative activities, the odds of teacher participation in collaboration are lower if time spent on managing classroom disruption goes up. For seven of the twelve activities, the odds of teacher participation are higher if the teacher is female. Specifically, these seven activities are mentoring, dialogue about teaching, exchanging teaching materials, team conferences, discussions about learning, teaching a joint class, and coordinating homework practice. Finally, the odds of teacher participation in all twelve types of collaboration are higher in Hungary as in all the other countries with high teacher efficacy.

3.8.26 Summary of Results – RQ2. Factor A (which gets at staff development consistent with school goals) appears to be systematically associated with three different types of collaborative activity across three countries – Brazil, Poland and Denmark. These activities are teachers exchanging teaching materials, engaging in discussions about learning and participating in teacher observation and feedback. Factor B (strengthening school culture) is systematically associated with frequent participation in team conferences and discussions about learning in Denmark and Mexico. Factor C (classroom management) is systematically negatively associated with teacher participation in professional development networks in both Poland and Hungary.

Additionally, the finding that across all countries analyzed the odds of teacher participation in the majority of different types of collaborative activity are higher when teachers have a high teacher efficacy is fairly robust. School climate factors such as time spend on administrative tasks and time spent maintaining discipline in class are also significantly associated with teacher participation for many of the collaborative activities. This makes intuitive sense given that time spent on classroom discipline implies less time for collaborative professional development activities.

Table 18 : Results for Types of Collaboration & Transformational leadership in Denmark

Dependent Variables (0-1)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Leadership Indices (IV)												
Factor A	1.059	0.965	0.927	1.096	1.050	1.352***	1.088	1.187**	1.239*	1.289***	0.939	1.018
	(0.073)	(0.048)	(0.074)	(0.086)	(0.058)	(0.141)	(0.164)	(0.079)	(0.156)	(0.110)	(0.073)	(0.049)
Factor B	0.916	0.985	1.253**	1.141	0.900	1.282	2.310***	1.246**	1.253**	0.970	1.229***	1.099**
	(0.060)	(0.060)	(0.112)	(0.099)	(0.061)	(0.202)	(0.325)	(0.105)	(0.131)	(0.056)	(0.072)	(0.052)
School Controls												
Female Principal	1.430***	1.303**	0.788	1.314*	0.677***	0.452***	0.502**	0.564***	0.758	1.104	1.177	1.172*
	(0.138)	(0.136)	(0.132)	(0.181)	(0.071)	(0.067)	(0.135)	(0.078)	(0.159)	(0.105)	(0.125)	(0.102)
Principal Experience	1.068	1.321***	1.297**	1.320**	1.348***	1.325	0.745	0.922	1.677***	1.010	1.066	1.110
	(0.090)	(0.121)	(0.161)	(0.172)	(0.148)	(0.227)	(0.158)	(0.077)	(0.216)	(0.109)	(0.108)	(0.086)
Public	1.201**	1.046	1.168	0.904	2.158***	4.715***	10.58***	3.913***	5.857***	0.793**	0.922	1.505***
	(0.100)	(0.096)	(0.192)	(0.142)	(0.243)	(0.861)	(2.290)	(0.479)	(0.767)	(0.077)	(0.126)	(0.125)
Language Difference	1.156***	1.068**	1.218***	1.246**	1.004	0.821	0.913	0.957	1.261**	1.378***	0.734***	0.997
	(0.043)	(0.035)	(0.072)	(0.119)	(0.073)	(0.098)	(0.083)	(0.053)	(0.136)	(0.098)	(0.038)	(0.038)
Parent Education	0.891	0.905	1.129	0.725**	0.993	1.969***	1.154	1.247*	1.294*	0.746**	0.473***	1.007
	(0.077)	(0.076)	(0.128)	(0.109)	(0.092)	(0.375)	(0.226)	(0.145)	(0.190)	(0.083)	(0.056)	(0.076)
School Climate												
% Time on Administrative	1.022*	1.036**	0.990	0.963***	0.994	0.969**	0.979**	0.946***	1.016	1.035***	0.994	1.000
	(0.012)	(0.014)	(0.014)	(0.012)	(0.009)	(0.014)	(0.010)	(0.008)	(0.015)	(0.010)	(0.009)	(0.010)
% Time on Classrm	0.992**	0.986***	1.002	0.991	0.993*	0.981***	0.970***	0.990*	0.993	1.004	0.986***	0.980***
	(0.003)	(0.004)	(0.004)	(0.006)	(0.004)	(0.007)	(0.007)	(0.006)	(0.005)	(0.004)	(0.004)	(0.004)
Teacher Background												
Female Teacher	0.978	1.093	1.054	2.191***	2.372***	1.695***	1.044	1.218	1.362***	0.881	0.822***	1.244***
	(0.087)	(0.079)	(0.137)	(0.255)	(0.244)	(0.252)	(0.150)	(0.153)	(0.141)	(0.069)	(0.061)	(0.093)
Teacher Experience	1.351***	1.681***	0.884	1.003	0.864	0.633***	0.897	0.791**	0.787	1.186**	1.307***	1.093
	(0.117)	(0.132)	(0.090)	(0.157)	(0.082)	(0.107)	(0.137)	(0.085)	(0.128)	(0.101)	(0.088)	(0.077)
Teacher Efficacy	2.111***	1.450***	1.012	1.045	1.439***	1.351*	2.789***	2.306***	1.699***	1.334***	1.392***	1.587***
	(0.183)	(0.149)	(0.110)	(0.158)	(0.184)	(0.244)	(0.708)	(0.350)	(0.274)	(0.125)	(0.146)	(0.137)
Constant	0.406***	0.600***	0.124***	6.836***	1.827***	7.310***	11.10***	4.761***	1.118	0.172***	4.594***	0.854
	(0.064)	(0.103)	(0.028)	(2.029)	(0.311)	(2.407)	(4.142)	(0.898)	(0.270)	(0.029)	(0.855)	(0.104)
N	1,125	1,125	1,125	1,114	1,114	1,127	1,125	1,123	1,119	1,125	1,127	1,115

Notes:

1. All numbers are Odds ratios 2. std errors are brr 3. sig levels p<0.01 ***, p<0.05 **, p<0.10 *

4. (1)=PD Network, (2)=Collaborative Research, (3)=Mentoring, (4)=Dialogue about teaching, (5)=Textbook discussion, (6)=Exchange teaching materials (7)=Team Conferences, (8)=Discuss Learning, (9)= team teaching, (10)=observation/feedback, (11)=Joint Class, (12)=Coordinate HW Practice

Table 19 : Results for Types of Collaboration & Transformational leadership in Poland

Dependent Variables (0-1)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Leadership Indices (IV)												
Factor A	0.964***	1.044***	1.002	1.056***	1.039***	1.092***	1.054***	1.173***	0.992	1.083***	0.983	1.076***
	(0.010)	(0.009)	(0.012)	(0.017)	(0.011)	(0.013)	(0.018)	(0.017)	(0.009)	(0.012)	(0.012)	(0.010)
Factor C	1.203***	1.067**	1.028	0.900	0.951	0.977	0.993	0.980	0.979	1.039	0.992	1.055
	(0.036)	(0.030)	(0.041)	(0.057)	(0.039)	(0.042)	(0.057)	(0.059)	(0.026)	(0.040)	(0.035)	(0.037)
School Controls												
Female Principal	0.862**	0.967	1.357***	1.508***	0.989	0.963	0.951	0.801*	1.149**	0.915	0.976	0.753***
	(0.055)	(0.058)	(0.107)	(0.177)	(0.077)	(0.083)	(0.096)	(0.099)	(0.067)	(0.064)	(0.069)	(0.048)
Principal Experience	0.840***	1.017	1.198**	1.215	0.892	1.026	0.682***	1.120	0.884*	1.193**	1.065	1.036
	(0.050)	(0.050)	(0.100)	(0.173)	(0.084)	(0.104)	(0.082)	(0.129)	(0.056)	(0.081)	(0.073)	(0.069)
Public	1.858***	1.319**	1.682**	2.407***	1.182	1.212	1.630*	0.792	0.899	1.612**	0.449***	0.955
	(0.131)	(0.182)	(0.376)	(0.605)	(0.271)	(0.253)	(0.433)	(0.152)	(0.141)	(0.318)	(0.062)	(0.181)
Language Difference	0.981	0.874***	1.035	0.803**	0.919	0.801**	0.747**	0.931	1.258***	0.823***	1.006	1.242***
	(0.050)	(0.040)	(0.076)	(0.076)	(0.073)	(0.081)	(0.103)	(0.112)	(0.077)	(0.050)	(0.053)	(0.066)
Parent Education	1.063	1.360**	1.502*	1.707***	0.803	0.764	0.986	0.648**	1.078	1.856***	0.727***	0.817
	(0.064)	(0.188)	(0.321)	(0.321)	(0.171)	(0.138)	(0.254)	(0.109)	(0.113)	(0.318)	(0.062)	(0.120)
School Climate												
% Time on Administrative Tasks	1.033***	1.031***	1.102***	1.070***	1.031***	1.047***	1.085***	1.118***	1.041***	1.068***	1.048***	1.041***
	(0.006)	(0.006)	(0.010)	(0.020)	(0.008)	(0.010)	(0.012)	(0.037)	(0.006)	(0.007)	(0.008)	(0.007)
% Time on Classrm Disruption	0.988***	1.000	0.999	0.988**	0.990*	0.981***	0.976***	0.981***	0.993**	0.987***	0.981***	0.974***
	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)	(0.003)	(0.003)	(0.005)	(0.003)	(0.003)	(0.002)	(0.003)
Teacher Background												
Female Teacher	1.192***	1.028	1.234***	1.631***	0.522***	1.657***	1.926***	2.176***	1.201***	0.823***	1.175**	1.191***
	(0.071)	(0.074)	(0.074)	(0.176)	(0.069)	(0.120)	(0.121)	(0.206)	(0.070)	(0.054)	(0.076)	(0.073)
Teacher Experience	1.593***	1.267***	0.632***	1.216*	0.752***	0.987	1.371***	1.763***	1.134***	0.616***	1.050	1.365***
	(0.079)	(0.073)	(0.031)	(0.130)	(0.059)	(0.055)	(0.083)	(0.184)	(0.054)	(0.035)	(0.049)	(0.068)
Teacher Efficacy	1.110*	1.414***	1.051	1.272	1.920***	1.261***	1.121	2.323***	1.659***	1.414***	1.446***	1.726***
	(0.063)	(0.085)	(0.066)	(0.197)	(0.217)	(0.075)	(0.092)	(0.369)	(0.112)	(0.088)	(0.083)	(0.118)
Constant	0.706***	0.473***	0.806	6.513***	0.164***	2.476***	2.136***	9.877***	0.403***	0.892	2.545***	0.510***
	(0.080)	(0.074)	(0.214)	(2.173)	(0.045)	(0.593)	(0.610)	(2.730)	(0.064)	(0.208)	(0.433)	(0.104)
N	2,532	2,532	2,532	2,500	2,518	2,510	2,514	2,519	2,391	2,514	2,509	2,476

Notes:

1. All numbers are Odds ratios 2. std errors are brr 3. sig levels p<0.01 ***, p<0.05 **, p<0.10 *

4. (1)=PD Network, (2)=Collaborative Research, (3)=Mentoring, (4)=Dialogue about teaching, (5)=Textbook discussion, (6)=Exchange teaching materials (7)=Team Conferences, (8)=Discuss Learning, (9)= team teaching, (10)=observation/feedback, (11)=Joint Class, (12)=Coordinate HW Practice

Table 20 : Results for Types of Collaboration & Transformational leadership in Brazil

Dependent Variables (0-1)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Leadership Indices (IV)												
Factor A	1.090	0.937	0.932	0.915	0.984	0.891**	0.841***	0.809***	1.043	0.881**	0.962	0.928
	(0.066)	(0.059)	(0.050)	(0.069)	(0.040)	(0.041)	(0.053)	(0.052)	(0.043)	(0.045)	(0.044)	(0.049)
School Controls												
Female Principal	1.356**	0.912	0.805***	1.044	0.923	1.166*	1.415***	1.038	1.066	0.951	1.211	0.970
	(0.200)	(0.064)	(0.064)	(0.154)	(0.087)	(0.107)	(0.167)	(0.151)	(0.105)	(0.128)	(0.160)	(0.108)
Principal Experience	0.858	0.989	1.031	1.350*	0.825*	1.000	0.797*	0.712**	0.704***	0.863	0.732***	0.776*
	(0.104)	(0.123)	(0.100)	(0.214)	(0.095)	(0.106)	(0.096)	(0.105)	(0.065)	(0.172)	(0.062)	(0.104)
Public	1.067	0.670***	1.461***	1.270	0.786	1.690***	0.862	1.073	0.758**	0.921	1.436***	0.917
	(0.221)	(0.088)	(0.188)	(0.400)	(0.133)	(0.204)	(0.130)	(0.208)	(0.082)	(0.185)	(0.189)	(0.132)
Language Difference	0.955	0.992	1.131	0.720*	1.203*	0.927	0.708***	0.759**	0.940	1.175	1.029	1.112
	(0.124)	(0.124)	(0.105)	(0.134)	(0.132)	(0.105)	(0.071)	(0.087)	(0.095)	(0.127)	(0.107)	(0.121)
Parent Education	1.767***	0.827	1.290**	1.914	0.828	1.254	1.447*	1.683	0.860	0.618**	1.063	1.213
	(0.240)	(0.139)	(0.159)	(0.764)	(0.192)	(0.297)	(0.281)	(0.531)	(0.179)	(0.131)	(0.279)	(0.258)
School Climate												
Tasks	1.017**	1.041***	1.034***	0.995	1.015**	1.018***	1.022***	1.011	1.048***	1.045***	1.035***	1.044***
	(0.008)	(0.011)	(0.006)	(0.018)	(0.006)	(0.006)	(0.007)	(0.010)	(0.008)	(0.006)	(0.009)	(0.007)
Disruption	1.000	0.995	1.001	0.988***	0.992***	0.986***	0.985***	0.981***	0.991***	0.994*	0.992***	0.994**
	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.005)	(0.003)	(0.003)	(0.003)	(0.003)
Teacher Background												
Female Teacher	1.136**	0.889	1.080	1.963***	1.056	2.065***	1.621***	1.538***	1.274***	0.775***	1.295***	1.042
	(0.070)	(0.143)	(0.062)	(0.223)	(0.069)	(0.134)	(0.112)	(0.147)	(0.069)	(0.050)	(0.080)	(0.063)
Teacher Experience	1.355***	0.976	1.219***	1.219	1.110	1.170***	1.153**	1.062	1.261***	0.789***	1.131*	0.899
	(0.099)	(0.053)	(0.078)	(0.227)	(0.084)	(0.066)	(0.075)	(0.103)	(0.077)	(0.070)	(0.070)	(0.062)
Teacher Efficacy	1.740***	1.313***	1.464***	1.495***	1.292***	1.462***	1.322***	1.317**	1.515***	1.454***	1.623***	1.882***
	(0.222)	(0.079)	(0.101)	(0.212)	(0.087)	(0.106)	(0.126)	(0.149)	(0.109)	(0.158)	(0.134)	(0.136)
Constant	0.148***	1.826*	0.462***	14.99***	0.239***	0.622**	3.385***	8.607***	0.719	0.171***	0.489***	0.522**
	(0.043)	(0.657)	(0.113)	(5.758)	(0.093)	(0.143)	(0.919)	(2.149)	(0.167)	(0.048)	(0.122)	(0.144)
N	3,641	3,641	3,641	3,587	3,622	3,619	3,631	3,626	3,608	3,632	3,633	3,622

Notes:

1. All numbers are Odds ratios 2. std errors are brr 3. sig levels p<0.01 ***, p<0.05 **, p<0.10 *

4. (1)=PD Network, (2)=Collaborative Research, (3)=Mentoring, (4)=Dialogue about teaching, (5)=Textbook discussion, (6)=Exchange teaching materials (7)=Team Conferences, (8)=Discuss Learning, (9)= team teaching, (10)=observation/feedback, (11)=Joint Class, (12)=Coordinate HW Practice

Table 21 : Results for Types of Collaboration & Transformational leadership in Mexico

Dependent Variables (0-1)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Leadership Indices (IV)												
Factor B	1.122	1.071	1.113**	1.310***	1.111*	1.091*	1.245***	1.196***	1.050	1.037	1.080	1.089
	(0.080)	(0.054)	(0.048)	(0.092)	(0.060)	(0.055)	(0.072)	(0.068)	(0.066)	(0.071)	(0.058)	(0.072)
School Controls												
Female Principal	0.979	1.200**	1.099	1.371**	1.200**	1.245	1.201	1.427***	0.820***	0.521***	1.153**	0.900
	(0.112)	(0.108)	(0.078)	(0.199)	(0.104)	(0.190)	(0.138)	(0.117)	(0.056)	(0.062)	(0.083)	(0.083)
Principal Experience	0.898	1.035	0.967	0.962	0.834**	0.896	1.020	0.765***	1.036	0.901	0.677***	0.896
	(0.062)	(0.087)	(0.070)	(0.109)	(0.072)	(0.066)	(0.082)	(0.059)	(0.059)	(0.101)	(0.078)	(0.069)
Public	1.104	0.939	1.084	2.585**	0.627***	0.966	1.411***	0.660	0.927	0.470**	0.965	0.910
	(0.168)	(0.172)	(0.179)	(1.038)	(0.108)	(0.132)	(0.170)	(0.171)	(0.182)	(0.143)	(0.132)	(0.183)
Language Difference	1.164**	1.034	0.874*	0.753***	0.801***	1.341***	1.059	0.866*	1.159*	1.446***	1.179**	1.191**
	(0.068)	(0.068)	(0.064)	(0.076)	(0.065)	(0.089)	(0.110)	(0.071)	(0.089)	(0.112)	(0.090)	(0.104)
Parent Education	0.910	0.930	1.141	2.356	0.972	2.141***	0.894	1.005	0.798	1.018	1.083	1.125
	(0.124)	(0.275)	(0.169)	(1.256)	(0.163)	(0.416)	(0.155)	(0.310)	(0.127)	(0.333)	(0.127)	(0.218)
School Climate												
Tasks	1.017**	1.025***	1.029***	1.006	1.010	1.014**	1.016*	1.005	1.017***	1.070***	1.040***	1.047***
	(0.008)	(0.007)	(0.005)	(0.008)	(0.008)	(0.006)	(0.009)	(0.006)	(0.006)	(0.006)	(0.009)	(0.005)
Disruption	0.996	0.986***	0.996	0.986**	0.999	0.988***	0.996	0.990***	1.010***	0.998	0.999	1.004
	(0.004)	(0.004)	(0.004)	(0.006)	(0.004)	(0.003)	(0.004)	(0.003)	(0.003)	(0.008)	(0.003)	(0.004)
Teacher Background												
Female Teacher	0.914	0.999	1.071	1.295**	0.925	1.333***	1.202**	0.971	0.812**	0.679***	1.094	1.162**
	(0.100)	(0.057)	(0.087)	(0.132)	(0.057)	(0.119)	(0.085)	(0.072)	(0.069)	(0.064)	(0.067)	(0.073)
Teacher Experience	1.087	0.876	1.145**	1.178*	1.084	1.004	1.262***	1.200**	1.065	0.919	1.236**	1.099
	(0.101)	(0.073)	(0.064)	(0.109)	(0.097)	(0.116)	(0.110)	(0.089)	(0.120)	(0.075)	(0.106)	(0.069)
Teacher Efficacy	1.238***	1.177***	1.238***	1.005	1.360***	1.343***	1.128	1.546***	1.225**	1.430***	1.434***	1.401***
	(0.058)	(0.071)	(0.078)	(0.116)	(0.097)	(0.088)	(0.102)	(0.128)	(0.103)	(0.154)	(0.082)	(0.084)
Constant	0.274***	2.042***	0.571**	6.252***	0.562**	0.644**	1.664	3.713***	0.838	0.132***	0.390***	0.163***
	(0.060)	(0.486)	(0.153)	(2.408)	(0.144)	(0.122)	(0.547)	(0.983)	(0.241)	(0.060)	(0.076)	(0.036)
N	2,211	2,211	2,211	2,177	2,204	2,199	2,211	2,204	2,187	2,210	2,208	2,205

Notes:

1. All numbers are Odds ratios 2. std errors are brr 3. sig levels p<0.01 ***, p<0.05 **, p<0.10 *

4. (1)=PD Network, (2)=Collaborative Research, (3)=Mentoring, (4)=Dialogue about teaching, (5)=Textbook discussion, (6)=Exchange teaching materials (7)=Team Conferences, (8)=Discuss Learning, (9)= team teaching, (10)=observation/feedback, (11)=Joint Class, (12)=Coordinate HW Practice

Table 22 : Results for Types of Collaboration & Transformational leadership in Hungary

Dependent Variables (0-1)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Leadership Indices (IV)												
Factor C	0.839***	0.984	0.911**	1.034	1.101*	0.962	1.245***	1.268***	1.027	0.966	1.090*	1.046
	(0.037)	(0.042)	(0.042)	(0.054)	(0.057)	(0.048)	(0.062)	(0.049)	(0.051)	(0.060)	(0.055)	(0.057)
School Controls												
Female Principal	1.367***	0.937	1.706***	1.097	0.667***	1.093	1.040	1.035	1.283**	1.761***	1.217***	1.169***
	(0.112)	(0.068)	(0.158)	(0.076)	(0.054)	(0.082)	(0.082)	(0.069)	(0.130)	(0.163)	(0.079)	(0.063)
Principal Experience	1.405***	0.898	1.417***	1.569***	0.950	1.013	1.334***	1.295***	1.398***	1.447***	1.341***	1.142**
	(0.099)	(0.060)	(0.132)	(0.118)	(0.092)	(0.063)	(0.100)	(0.083)	(0.125)	(0.145)	(0.090)	(0.070)
Public	1.337***	0.786**	1.189	0.815**	0.822	1.182*	0.826*	1.283***	0.573***	0.661***	0.918	0.920
	(0.106)	(0.095)	(0.144)	(0.079)	(0.111)	(0.109)	(0.092)	(0.121)	(0.086)	(0.075)	(0.082)	(0.065)
Language Difference	1.320*	1.142	1.250*	1.222	0.676**	0.979	1.765***	1.737***	3.031***	1.056	1.871***	1.051
	(0.213)	(0.173)	(0.150)	(0.330)	(0.121)	(0.142)	(0.356)	(0.275)	(0.441)	(0.203)	(0.230)	(0.156)
Parent Education	1.021	1.263**	1.388***	1.056	1.552***	1.599***	1.327***	0.881	1.476***	1.231*	0.869	0.860
	(0.082)	(0.113)	(0.133)	(0.099)	(0.150)	(0.121)	(0.142)	(0.095)	(0.165)	(0.145)	(0.081)	(0.078)
School Climate												
% Time on Administrative Tasks	1.034***	1.005	1.052***	1.005	1.053***	1.031***	1.048***	1.042***	1.005	1.089***	1.023***	1.009**
	(0.006)	(0.005)	(0.005)	(0.007)	(0.007)	(0.006)	(0.009)	(0.007)	(0.005)	(0.007)	(0.006)	(0.004)
% Time on Classrm Disruption	0.998	0.990**	0.989***	1.006*	1.030***	0.997	0.990***	0.993***	0.992*	0.978***	0.985***	0.993**
	(0.003)	(0.004)	(0.003)	(0.004)	(0.004)	(0.004)	(0.003)	(0.002)	(0.005)	(0.003)	(0.003)	(0.003)
Teacher Background												
Female Teacher	1.048	0.579***	1.233***	1.275***	0.734**	1.403***	1.491***	1.374***	0.610***	1.068	1.304***	1.454***
	(0.067)	(0.045)	(0.078)	(0.099)	(0.088)	(0.105)	(0.100)	(0.077)	(0.050)	(0.085)	(0.098)	(0.086)
Teacher Experience	1.641***	0.947	1.061	0.738***	1.003	0.917	1.494***	1.044	1.036	1.305***	0.945	1.610***
	(0.096)	(0.102)	(0.061)	(0.048)	(0.120)	(0.070)	(0.077)	(0.064)	(0.094)	(0.082)	(0.050)	(0.103)
Teacher Efficacy	1.588***	2.761***	2.268***	1.338*	1.829***	1.522***	2.258***	2.254***	1.728***	1.610***	2.324***	2.219***
	(0.158)	(0.360)	(0.208)	(0.197)	(0.258)	(0.216)	(0.406)	(0.271)	(0.191)	(0.158)	(0.239)	(0.241)
Constant	0.199***	0.318***	0.266***	2.805***	0.0976***	1.174	0.753	0.571**	0.0603***	0.252***	0.303***	0.589**
	(0.052)	(0.076)	(0.063)	(1.009)	(0.031)	(0.239)	(0.177)	(0.127)	(0.015)	(0.072)	(0.060)	(0.121)
N	2,393	2,393	2,393	2,353	2,403	2,374	2,383	2,372	2,350	2,385	2,368	2,353

Notes:

1. All numbers are Odds ratios 2. std errors are brr 3. sig levels p<0.01 ***, p<0.05 **, p<0.10 *

4. (1)=PD Network, (2)=Collaborative Research, (3)=Mentoring, (4)=Dialogue about teaching, (5)=Textbook discussion, (6)=Exchange teaching materials (7)=Team Conferences, (8)=Discuss Learning, (9)= team teaching, (10)=observation/feedback, (11)=Joint Class, (12)=Coordinate HW Practice

3.8.3 Results – Research Question 3

3.8.31 Denmark. In Denmark, the index of teacher collaboration is positively associated with teachers' job satisfaction. What this implies is that the odds of teacher satisfaction are higher when teachers frequently engage in a variety of collaborative activities ($p<0.05$). Teachers in Denmark who teach in public schools have lower odds of satisfaction ($p<0.01$). In Denmark, teacher autonomy with respect to curriculum is associated with higher odds of teacher satisfaction. Given that on average teachers in Denmark report a high level of autonomy[28]this result is consistent with the literature that claims high levels of teacher autonomy are associated with higher teacher satisfaction (Moore, 2012; Perie & Baker, 1997; Renzulli, 2011). The odds of teacher satisfaction are lower when teachers spend more time on classroom discipline issues. This finding is also consistent with the literature on teacher satisfaction. In fact, student discipline issues have been cited as a major reason for teacher dissatisfaction (Kennedy, 2005; Liu & Meyer, 2005; Stockard & Lehman, 2004). Finally, there appears to be a positive and statistically significant association between teacher efficacy and teacher satisfaction in Denmark and this finding is consistent across the countries analyzed.

3.8.32 Poland. In Poland, the odds of teacher satisfaction are higher if teachers engage frequently in a breadth of collaborative activity. Poland appears to have a shortage of school personnel[29]. Reflecting this school climate, the odds of teacher satisfaction are lower when there is a shortage of school personnel. The odds of teacher satisfaction are lower when teachers spend more of their class time maintaining discipline. Teachers in Poland are overwhelmingly female (75%). Female teachers in Poland report higher odds of job satisfaction. Finally, there is

[28] See table of descriptives (table 16). Level of autonomy is 0.77 on a scale from -1 to 1 where a higher value indicates more autonomy.

[29] The average shortage of school personnel in Poland is -0.74 on a scale of -1 to 1 where 1 indicates this is not a problem.

a positive and statistically significant relationship between teachers' job satisfaction in Poland and teacher efficacy.

3.8.33 Brazil. In Brazil, the odds of teacher satisfaction are higher when teachers engage frequently in a breadth of collaborative activities. Teachers who work in public schools in Brazil report lower odds of being satisfied with their jobs. Teachers in Brazil who spend more of their class time maintaining discipline report lower odds of being satisfied with their jobs. Additionally, female teachers in Brazil report higher odds of job satisfaction. From table 16 we know that in Brazil 73% of teachers are female. Further, Brazilian teachers who are more experienced (>10 yrs) have lower odds of job satisfaction. Finally, the odds of teacher satisfaction are higher among teachers who report high level of teacher efficacy.

3.8.34 Mexico. In Mexico, the odds of teacher satisfaction are higher if teachers engage frequently in a breadth of collaborative activity. Teachers teaching classes in which 60% or more of the students have at least one parent who has completed higher secondary or higher (ISCED level 5) report higher odds of job satisfaction. In other words, the odds of teacher satisfaction are higher when the level of parent education is high. The odds of satisfaction are lower if teachers spend more class time maintaining order. This finding is fairly intuitive and consistent across the countries analyzed. Finally, the odds of teacher satisfaction in Mexico are higher when teachers report high teacher efficacy.

3.8.35 Hungary. In Hungary, the odds of teacher satisfaction are higher if teachers frequently engage in a breadth of collaborative activities. Among school factors, the odds of teacher satisfaction are lower for teachers teaching in public schools in Hungary. The odds of teacher satisfaction are also lower when the number of students who speak a language different

Table 23: Table of Results for Teacher Satisfaction & Index of Collaboration

	DNK	POL	BRA	MEX	HUN
Teacher Satisfaction (DV)					
Index of Collaboration (IV)	2.193**	5.956***	11.49***	9.810***	2.587***
	(0.663)	(1.353)	(2.102)	(3.459)	(0.445)
School Controls					
Public	0.442***	1.423	0.652*	1.286	0.593*
	(0.075)	(0.417)	(0.166)	(0.610)	(0.163)
Language Difference	1.021	1.024	0.977	0.883	0.577***
	(0.088)	(0.100)	(0.113)	(0.137)	(0.116)
Parent Education	0.942	1.083	1.566	2.402**	1.286**
	(0.135)	(0.281)	(0.625)	(0.881)	(0.131)
School Climate					
Index of Curricular Autonomy	1.241**	1.177**	0.986	1.041	0.951
	(0.113)	(0.084)	(0.063)	(0.102)	(0.084)
Index of Lack of School Personnel	1.038**	0.968***	1.010	0.992	1.008
	(0.018)	(0.007)	(0.009)	(0.011)	(0.008)
% Time on Classroom Disruption	0.974***	0.965***	0.990***	0.981***	0.978***
	(0.005)	(0.004)	(0.003)	(0.004)	(0.004)
Teacher Controls					
Teacher Gender (Female)	0.967	1.246**	1.260**	1.174	1.297***
	(0.090)	(0.111)	(0.112)	(0.122)	(0.105)
Teacher Experience	0.835	0.986	0.718***	1.159	0.862
	(0.113)	(0.083)	(0.045)	(0.124)	(0.096)
Teacher Efficacy	1.529**	1.581***	2.136***	1.876***	4.779***
	(0.263)	(0.214)	(0.264)	(0.270)	(0.906)
Constant	10.05***	5.550***	2.916***	5.421***	9.543***
	(2.977)	(1.935)	(0.978)	(2.974)	(2.975)
N	1,147	2,725	4,014	2,301	2,532

Notes:

1. All numbers reported are odds ratios. 2. Numbers in parentheses represent standard errors

3. Significance is given by p<0.01 ***; p<0.05 **; p<0.10*

from the language of instruction increases. Presumably, this is so because communication with the student becomes more challenging when language is a barrier. In Hungary, as in the other countries analyzed the odds of teacher satisfaction are lower when more of a teacher's class time is given over to maintaining discipline. Female teachers in Hungary have higher odds of job

satisfaction and there is a significant positive relationship between job satisfaction and teacher efficacy in Hungary.

3.8.36 Summary – RQ3 Results. To summarize, we observe a consistently significant positive relationship between teacher satisfaction and frequent teacher engagement in a breadth of collaborative activities across all the countries analyzed. We also observe that across all five countries more class time spent maintaining discipline is significantly associated with lower odds of teacher job satisfaction. This makes intuitive sense since, time spent in maintaining order is time taken away from instruction which is an integral part of a teachers work. Demographically, we see that in three of the five countries (Poland, Brazil, and Hungary) the odds of teacher satisfaction are higher for females than for males and this association is significant ($p<0.05$). This may simply reflect the fact that traditionally teaching has been a female dominated profession or it may be due to the fact that in these countries over 70 percent of the teachers are female. Finally, across all five countries we see a statistically significant relationship between teacher efficacy and teachers' job satisfaction. This finding is consistent with the literature on teacher efficacy (See Capara et al, 2006; Lee, Dedrick, & Smith, 1991; Tschannen-Moran et al. 1998; Tschannen-Moran & Hoy, 2007).

The following section provides a detailed look at how recent policy changes and country context serve as an explanatory framework within which to make sense of the results in Mexico.

3.9 Contextual Discussion of Results in Mexico

3.9.1 The National Context: In 2009 Mexico ranked as the world's fourteenth largest economy (OECD 2011). Improving the quality of education is a political and social priority in Mexico given the high poverty rates and high inequality in the system (OECD, 2010; OECD, 2011). A wide range of reforms over the past twenty years have led to improvements in school enrolment and school quality. Despite previous efforts to institute systemic improvement

however, one in two 15 year olds in Mexico failed to reach even the baseline achievement level (level 2) in PISA 2006 as compared to the OECD average of 19.2 percent (OECD, 2010). Similarly, though attainment rates in Mexico have risen sharply since 2000 the proportion of adults who have attained at least an upper secondary education in Mexico is one of the smallest among the OECD countries (36 percent) and considerably lower than the OECD average of 75 percent (OECD, 2013).

Location, ethnic background, and poverty are all factors associated with inequality in school enrolment in Mexico. In Chiapas for example, for every 1,000 students who entered basic education at the appropriate age in the year 2000, only 476 exited on time versus 747 in Aguascalientes (OECD, 2011). Issues of educational coverage and equity continue to be fundamental problems at the forefront of educational service provision in Mexico.

3.9.2 Overview of the Educational System. In 2010, Mexico spent approximately 6.2 percent of its GDP on education (OECD, 2013). This is slightly below the OECD average of 6.3 percent but higher than the proportion of GDP spent on education in some developed countries like Australia, Spain, and Switzerland (OECD, 2013). Yet, in the Mexican context increasing expenditure on education does not necessarily translate into more spending per student. Thus, average annual expenditure per student (from primary to tertiary education) at 20 percent in Mexico continues to lag the OECD average of 28 percent of GDP per capita (OECD, 2013).

Schools in Mexico operate with scarce resources. These resources are allocated mostly to staff compensation. Mexico devotes 93.3 percent of its education budget to staff compensation (OECD, 2013).

The Mexican education system is organized into three major levels. These are basic education (consisting of pre-school, primary, lower secondary), upper secondary education and

higher education (comprising university education, technological education and normal education) (Guevara et al., 2004). Primary education in Mexico is compulsory and consists of six grades. In 1993 lower secondary education was made obligatory. Mexico is now changing coverage of compulsory education to include upper secondary education with the aim of attaining universal upper secondary education by 2022 (OECD, 2013).

Compared to other OECD countries, Mexico has the highest student-teacher ratios at all levels of compulsory education (OECD, 2013). In 2011, the average pupil-teacher ratio for primary education in Mexico was 28 students per teacher (OECD, 2013). For the same year the average pupil-teacher ratio for secondary education in Mexico was even higher - 30 students per teacher (OECD, 2013).

Since Mexico's efforts to decentralize in 1992, it has been the state educational authorities' responsibility to provide, organize and supervise basic education and teacher training in Mexico (Guevara et al, 2004). Nonetheless, the Ministry of Education (SEP) still has considerable control in setting the curriculum, selecting the textbooks, hiring and firing school personnel and setting salary schedules for teachers. According to Guevara and Gonzalez (2004), the Ministry of Education (SEP) and the teachers' union are two key actors in the education policy arena within Mexico. The World Bank and the Inter-American Development Bank also have a major external presence in Mexican education (Guevara et al. 2004).

3.9.3 Profile of Teachers in Mexico. The largest proportion of teachers in Mexico is concentrated at the level of basic education. Primary school teachers constitute the bulk of this number (OECD, 2010). Further, the majority of teachers (around 80 percent) are public school teachers (Guevara et al. 2004). According to Guevara and Gonzalez (2004), primary school teachers attend to just one group of children for the whole school year. This implies that the

same teacher teaches all the subjects for the corresponding grade in the academic year. A characteristic of secondary school teachers, however, is the specification of the number of hours because a teacher teaches certain subjects to different groups/grades. Thus, secondary teachers may attend to different groups of students in different schools. This fact complicates the labor situation with respect to secondary school teachers and may also interfere with the nature and extent of teacher collaboration in Mexico (Guevara et al, 2004).

The TALIS 2007 data show that 57 percent of lower secondary teachers in Mexico are female which is consistent with the fact that in most TALIS countries there is a predominance of female teachers at the lower secondary level (TALIS, 2008). Further, around half of all lower secondary teachers in TALIS 2007 have ten or more years of experience. In Mexico, teacher education is organized by level. Teachers in basic education receive their preparation in higher education institutions called Teachers' Colleges (OECD, 2010). Upper secondary school teachers however, are prepared in universities in their subjects often without any specific training to develop teaching skills (OECD, 2010).

Almost all teachers, principals, and administrative personnel associated with basic education, training of teachers, and federal and state services of the Department of Public Education are members of the National Union of Educational Workers (SNTE) created in 1943. The SNTE deducts 1 percent of the salary of its members and also has considerable say in the hiring of new teachers (Guevara et al. 2004). Given its large membership (well in excess of a million education workers) the SNTE thus enjoys considerable economic and political clout in Mexico (Guevara et al, 2004).

Teacher promotion in Mexico (at the basic level) is addressed via two national programs. These are the vertical scale (EV) and the teaching career (CM). The CM is essentially a system

of horizontal promotion that allows teachers mobility and access to a higher income on a base salary. Evaluation criteria include seniority, academic degree, professional training, professional upgrading, professional performance and student progress. Notably, the CM system seeks to connect teacher performance to teacher salary (Guevara et al. 2004; OECD, 2010).

The vertical scale (EV) mechanism for promotion on the other hand only takes into account a teacher's seniority, educational qualification and professional development not their performance (Guevara et al., 2004). Promotion in the EV is conditional on the creation of positions via retirement or resignation of teachers. Promotions can occur within the same level from teaching to administrative or between teaching levels from primary to secondary. For those teachers who are in interim teaching positions and competing for permanent positions, evaluations by principals via teacher observations become quite relevant (Guevara et. al 2004). Although both career ladders (the CM and the EV) partially help to identify high performing teachers there are few negative consequences associated with identification of poor performance in Mexico.

Recent reform efforts in Mexico with respect to school management have included recommendations for a teacher evaluation system that is both summative and formative in nature. The OECD Steering group recommendations (2009) promote teacher evaluation that provides teachers feedback on how to improve their practice. The main purpose of evaluating teachers (as stated in these recommendations) is to improve their practice with the ultimate goal of improving student achievement.

Overall, Mexican teachers operate under fairly difficult conditions. Many hold more than one job at a time in order to supplement their income (OECD, 2010). This second job may or may not be related to the teaching profession but it is made possible by the fact that schools of

basic education work in two shifts (morning/afternoon) that are each five hours long. Mexico does not have formal induction programs for beginning teachers and teachers do not have adequate support and mentoring or a probationary period before obtaining a permanent position (OECD, 2010).

3.9.4 Leadership in Mexico. My analysis shows that only 36 percent of school principals in Mexico are women. This is consistent with what we know about leadership in Mexico perhaps indicating a "glass ceiling" for promotion possibilities for women within schools (TALIS, 2008). Around 62 percent of principals have 10 or more years of experience in Mexico and about 73 percent of schools in Mexico are public schools.

School administrators have virtually no role in personnel decisions or allocation of resources (OECD, 2010). It is the SNTE that negotiates directly with the SEP to set teacher salary schedules and yearly pay increases. By law all principals must belong to the SNTE, which is the teachers' union. The placement and hiring of teachers is often negotiated by state SNTE factions with corresponding state education authorities (OECD, 2010).

The role of the principal extends to evaluating the performance of their teachers, managing the assigned budget for their school, managing the school's relationship with the Parents' Association, and school maintenance. Parents' Associations mainly support the school authorities in the collection of funds and the organization of voluntary work related to school maintenance. Additionally, principals in Mexico spend a good bit of their time in paperwork compiling school statistics and completing school documents.

Because schools in Mexico operate in multiple shifts it is challenging to develop the school as a learning community where students can engage in extended discussions and extra-

curricular activities. Similarly, teachers too have little time to interact with parents and students, evaluate students individually and even prepare their classes (Santibanez et al. 2005). .

Given these sorts of constraints in the school environment it is not surprising that the aspect of transformational leadership that appears to matter positively for teacher collaboration in the context of Mexico is the principal's role in establishing a positive school climate (Factor B). Collaboration is only possible when school facilities are adequate and the principal is supportive of such teacher interaction. The index measuring lack of school personnel in my analysis has a low value of -0.73 for Mexico (on a scale from -1 to 1) thus indicating that schools in Mexico lack adequate instructional and other support personnel.

The variables that load onto Factor B are the principal's role in creating an orderly atmosphere in the school, principal and teacher collaboration on creating a school development plan, the principals role in fostering a task-oriented atmosphere in the school and the principals interaction with parents. In particular, one can see the relevance of the variable *parent_outreach,* (principal interaction with parents) which gets at the principals efforts at community fundraising. This is a powerful way in which principals in Mexico try to compensate for poor school infrastructure. Funds collected in this manner are subsequently utilized for building improvements and the purchase of essential office equipment such as a fax or copy machine. The relevance of the principal's role in creating an orderly atmosphere in the school (the variable *schorder*) for teacher collaboration is also somewhat intuitive. Presumably, less time spent on maintaining discipline helps foster opportunities for professional collaboration. Teachers in Mexico report that around 12 percent of their class time is spent maintaining discipline.

My analysis also shows specific collaborative activities that matter in the Mexican context are all school-based (see table 21, activities (3) to (8)) and pertain more to sharing of

instructional materials and improving instructional practice via teacher discussion rather than providing teacher observation and feedback.

Finally, the finding in table 23 that the odds of teacher satisfaction are higher in Mexico if the teachers engage in a breadth of collaborative activity is also explicable in terms of the poor support infrastructure in most schools there. Presumably, engagement in a variety of collaborative activities provide teachers the opportunity to form closer ties with colleagues and thus establish a sense of teacher community difficult for the most part in a majority of schools in Mexico due to the challenging work conditions there.

In sum, a key contribution of my work is that it extends knowledge about teacher collaboration - a less explored aspect of teacher policy in Mexico, as well as school management using large-scale comparative data for Mexico. This research is particularly relevant in the Mexican context given that teacher quality and school management are two aspects of education policy prioritized by the SEP (OECD, 2010; Santibanez et al., 2005).

3.10 Conclusion & Limitations

This analysis finds that different aspects of a principals' transformational leadership pertaining to staff development consistent with school goals, developing a positive school culture, and joint management of classroom issues are significantly associated with the frequency and breadth of teacher collaboration in the countries analyzed. This index of collaboration is also significantly and consistently associated with teacher satisfaction across all five countries. Additionally, teacher efficacy is positively associated with the index of collaboration as well as teachers' job satisfaction controlling for a range of teacher, principal and school factors and these findings appear to be quite robust across contexts.

There is a vast body of literature that documents that teachers' self-efficacy beliefs are related to the efforts teachers invest in the classroom, their persistence when things are less than smooth sailing and their resilience in the face of adversity. These behaviors are important because ultimately they impact students. From a policy perspective, principals would do well to address issues of teacher efficacy in their schools given the apparently strong and consistent association that exists between efficacy and teacher job satisfaction and also between efficacy and the frequency of teacher participation in a breadth of collaborative activities in schools. Leaders can address issues of teacher self-efficacy by providing institutional support (via sustained opportunities for formal and informal teacher collaboration that enable shared norms and values among teachers) and verbal endorsement of the job that teachers do. Research has shown that self-efficacy is stronger among teachers who perceive a positive school climate with a strong sense of teacher community. Transformational school leaders can help to create this strong teacher community within schools. For example, research has shown that "principals play an important role in allocating time for teachers to meet and for providing increased opportunities for job-embedded professional development (Wahlstrom & Louis, 2008, p.463)."

This analysis also shows that more class time spent maintaining discipline is negatively associated with teacher satisfaction and is also negatively associated with the index of collaboration across diverse national contexts. From a policy perspective the percent of time spent managing class disruption is reflective of school climate, a factor that is subject to policy manipulation by school principals.

This study relies primarily on the TALIS 2008 data to analyze the relationships between transformational leadership, teacher collaboration and teacher satisfaction in a subset of countries. A methodological limitation of this dataset is that the data are cross-sectional

permitting only correlational analyses. We cannot infer causality in the identified associations between transformational leadership and teacher collaboration or between collaboration and satisfaction because it is typically difficult to measure and identify all confounding variables and to include these in the quantitative model (Schneider, Carnoy, Kilpatrick, Schmidt & Shavelson, 2007). Thus, there is considerable potential to replicate similar analyses using longitudinal data which offer more flexibility for causal modelling. Additional analyses using different data would provide a valuable opportunity to examine whether and to what extent the results generated in this analysis hold true across diverse contexts and over time.

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CHAPTER 4

CUMULATIVE SYNTHESIS

The main purpose of this chapter is to synthesize results across the three earlier chapters in this dissertation. Accordingly, the next section succinctly summarizes key findings followed by a discussion of how these findings contribute to the literature on teacher satisfaction, leadership and collaboration. Next, I examine whether these findings are similar to or different from the extant U.S. based literature. Additionally, I address the limitations of the current study and discuss the policy implications of my findings. The chapter concludes by suggesting directions for future research.

4.1 Summary of Findings

The guiding question in chapter 1 of this dissertation was - *Is there variation in contextual factors associated with teacher satisfaction in a multi-country setting?* Here, I explored whether variation in student, teacher, and school backgrounds is associated with teacher satisfaction cross-nationally. Additionally, I examined the organizational context within schools to parse out which organizational factors matter for teacher satisfaction. This analytic review revealed several gaps in the literature on satisfaction. First, it indicated that multi-country work on teacher satisfaction is limited to a handful of studies leaving ample scope for further analysis. Second, an emphasis on leadership within the U.S. emerged, revealing the importance of this organizational factor for teacher satisfaction. Third, the review suggested the potential to explore teacher collaboration in settings other than the U.S. given the paucity of such work across multiple countries. Substantively, several of the international studies reviewed indicated that the wider social context of which the school is a part is an important predictor of teacher

satisfaction. Thus, the respect and recognition accorded to teachers by the community mattered for teacher satisfaction internationally.

Chapter 2 in this study capitalized on the results of the analytic review undertaken in the first chapter by focusing on principals' leadership style in a multi-country setting. Specifically, in this chapter, I examined both principal and teacher perspectives on teacher satisfaction for several countries in Asia and the U.S. after accounting for an extensive range of aggregated student and teacher demographic variables and school controls. Results of this analysis (Analysis III (PRTS – school level)) showed that principals' transformational leadership, is significantly associated with principal reported teacher satisfaction across all the Asian countries analyzed as well as the United States ($p<.01$)[30]. This result appears to indicate that a visionary and supportive leadership style as measured by the transformational leadership index is important for teacher satisfaction in Asia at least from the perspective of the school principals in these countries. The finding that two dimensions of transformational leadership - the principal's role in '*setting directions*' for the school and in '*developing people*' were associated with higher odds of teacher satisfaction in the countries analyzed is consistent with the U.S. literature on transformational leadership in schools (Bass & Avolio, 1994; Leithwood & Sun, 2012; Leithwood & Jantzi, 2005; Silins, 1994).

Interestingly, however, this pattern did not hold across all countries[31] when I analyzed transformational leadership factors and teacher perspectives on satisfaction. Teachers of a representative sample of students in Mongolia, Taiwan and Thailand seem to attach more importance to student and school background variables (with respect to their satisfaction levels) than particular aspects of transformational leadership. In Mongolia at least, a plausible reason

[30] See table 9 in chapter 2.
[31] The exceptions being Hong Kong, Indonesia, and Malaysia.

for this divergence may be a heavy emphasis on policy borrowing (See Steiner-Khamsi, 2004 for an understanding of policy borrowing in this country). It is possible that a similar phenomenon is reflected in Taiwan and Thailand. Implicit in the notion of policy borrowing is the possibility that principals in these countries are applying a predominantly western conceptualization of leadership considered appropriate by their Ministries but that these conceptualizations are less well understood or internalized by the teachers in these countries because many of these countries are still in the process of transitioning from centralized to decentralized systems. This may explain why principals in all the countries analyzed perceive these dimensions to be highly significant while teachers in this sample (with the exception of Hong Kong, Indonesia and Malaysia) do not. An alternative explanation is that the divergence in perspectives simply mirrors the centrality of the school for the principal versus the centrality of the classroom for the teacher.

Again, drawing on insights from chapter 1, chapter 3 focused on an empirical exploration of teacher collaboration in five OECD countries – Denmark, Brazil, Mexico, Poland and Hungary. Much has been written about the purported benefits of teacher collaboration but the notion of collaboration particularly with respect to leadership and satisfaction internationally has not received similar attention. I found that different aspects of a principals' transformational leadership pertaining to staff development consistent with school goals, developing a positive school culture, and joint management of classroom issues were significantly associated with the index of teacher collaboration (indicative of frequency and breadth of collaboration) in the countries analyzed. This index of collaboration was also significantly and consistently associated with teacher satisfaction across all five countries. Additionally, I also found that teacher efficacy (which I used as a control in these regressions) is positively associated with the

index of collaboration as well as teachers' job satisfaction even after controlling for a range of teacher, school, and student variables.

4.2 Study Contributions

This dissertation informs the literature on teacher satisfaction, leadership, and teacher collaboration in a number of ways. First, despite a growing awareness of the importance of context in leadership, it has not been adequately explored previously. By attempting to parse out the type of leadership that matters for teacher satisfaction in diverse geographic, social and cultural contexts and comparing these results to what is known about leadership within the U.S,, this dissertation empirically tests whether specific leadership phenomena that are U.S. based hold across diverse contexts. As such, it makes a valuable contribution to the field of Educational Leadership.

Second, only a few scholars (Sargent & Hannum, 2005 and Michaelowa & Wittman, 2007) have attempted to use large-scale survey data to understand and explore the issue of teacher satisfaction. Large-scale survey data have the advantage of generalizability of inferences within and across countries which is not necessarily true of self-collected or administrative data. By using two large-scale education datasets (TIMSS 2007 and TALIS 2008) that are international in scope, my dissertation addresses this limitation in previous literature on satisfaction.

Third, empirical analysis especially focused on six Asian countries in this dissertation addresses the issue of paucity of multi-country research (as identified in Table 1) that is Asia-based.

Fourth, in chapter 3, I show that a collaborative school climate matters for teacher satisfaction in international contexts. Additionally, my study contributes to the literature on

collaboration by deconstructing how different types of collaboration are associated with different measures of transformational leadership across countries. To date, large-scale empirical analysis on collaboration that is international in scope has been somewhat limited.

4.3 Comparative Insights

This analysis provides support for the view that organizational variables explain much of the variation in teacher satisfaction (see Johnson, Kraft & Papay, 2011; Ladd, 2011). Thus, I find that two aspects of transformational leadership – the principal's role in 'setting directions' and in 'developing people' are positively associated with teacher satisfaction in Asia. The results for Asia do provide support for what we know in a general sense about transformational leadership within the United States.

Additionally, my analysis in chapter 2 shows that there is no clear and consistent pattern across all six Asian countries analyzed in the role of teacher demographic and school context variables vis-à-vis teacher satisfaction. Findings with respect to teacher age and experience vary by country. For example, table 9 in chapter 2 indicates that principals in Hong Kong, Taiwan and Thailand perceive the odds of teacher satisfaction are higher when the teacher is more experienced. In Indonesia, however, this relationship is negative and significant. The literature on teacher experience within the U.S. is also somewhat contradictory with Perie and Baker (1997) indicating that very young (less than 3 years of experience) and very experienced teachers (more than twenty years) have lower levels of satisfaction and Liu and Ramsey (2008) contending that satisfaction increases with years of experience.

With respect to teacher gender, principals in Hong Kong and Indonesia perceive that the odds of satisfaction are lower for female teachers. In the other countries (including the U.S.) however, this variable is not statistically significant. This finding is consistent with earlier U.S.

literature that corroborate that the role of gender is not important in explaining variation in teacher satisfaction as compared to other school organization factors (Culver, Wolfle, & Cross, 1990, Johnson et al. 2011)

Previous research has found that school infrastructure is important for teacher satisfaction at least in the context of urban schools within the U.S. Results for the U.S. shown in table 9 appear to corroborate this finding. Table 9 shows that within the U.S. there is a positive correlation between good school facilities and teacher satisfaction. Results in other Asian work environments are not consistent with this finding perhaps indicating that in these schools leadership is more important as an explanatory factor for teacher satisfaction. Since not many scholars internationally have focused on the role of school infrastructure however, further research is necessary to support these results.

Finally, results from chapter 3 indicate a positive and significant relationship between the index of teacher collaboration and teacher satisfaction in the five OECD countries analyzed. This appears to be consistent with some of the U.S. literature that underscores the importance of teacher collaboration for teacher outcomes (See Culver et al, 1990; Johnson & Birkeland, 2003; Ladd, 2011; and Rosenholtz, 1990). I also find (in chapter 3) a negative and statistically significant relationship between student discipline issues and teacher satisfaction that is mirrored in research that is U.S. based (Ingersoll, 2001; Kennedy, 2005; Liu & Meyer, 2005; Perie & Baker, 1997; Stockard & Lehman, 2004).

4.4 Policy Implications & Limitations

What are the implications of these findings for leadership behavior in schools? Research has shown that "principals play an important role in allocating time for teachers to meet and for providing increased opportunities for job-embedded professional development (Wahlstrom &

Louis, 2008, p.463)." Thus, transformational school leaders can help to create a strong teacher community within schools.

From a policy perspective, this analysis shows that principals would do well to also address issues of teacher efficacy in their schools given the apparently strong and consistent association that exists between efficacy and teacher job satisfaction and also between efficacy and the frequency of teacher participation in a breadth of collaborative activities in schools. Transformational Leaders can address issues of teacher self-efficacy by providing institutional support (via sustained opportunities for formal and informal teacher collaboration that enable shared norms and values among teachers) and verbal endorsement of the job that teachers do.

Finally, this analysis finds that more class time spent maintaining discipline is negatively associated with teacher satisfaction and is also negatively associated with the index of collaboration across diverse national contexts. By altering the disciplinary climate in schools, principals can help to minimize the percent of time teachers spend managing classroom disruptions and maintaining order.

While the results mentioned above indicate promising evidence of the relationship between transformational leadership, collaboration and teacher satisfaction, it should be noted that the analyses presented here have some limitations which warrant discussion. Notably, although the literature indicates that aspects of transformational and instructional leadership may overlap (such as creation of a school vision, professional development of teachers etc) care was taken in chapter 2 to minimize such overlaps in order to avoid issues of multicollinearity. Thus, investigating the complexity of interrelationships between the different types of leadership behaviors[32] was not attempted in this dissertation.

[32] See for example Marks & Printy (2003) who show that instructional leadership may also be transformational in some instances.

Second, TIMSS 2007 data mainly allow analysis of one or at most two teachers per principal. This deviates from the literature on teacher satisfaction which ideally references a larger sample of teachers than was available to me via TIMSS. This limitation is somewhat offset by the fact that the TIMSS data are the only publicly available large-scale data that have rich contextual information on students, teachers and schools for several countries in Asia.

Third, all the analyses presented in this dissertation are correlational in nature. Thus, the findings pertaining to the relationships between transformational leadership and satisfaction or collaboration and satisfaction should not be interpreted in a causal manner. In other words, we cannot infer from the analyses presented that transformational leadership *causes* teacher satisfaction or that participation in collaborative activities *causes* teachers to be more satisfied with their jobs.

A final limitation of the study is that it does not include any measures of teacher salary although there is some international evidence to indicate that salary may be associated with teacher satisfaction (Zembylas & Papanastasiou, 2004). Neither TIMSS 2007 nor TALIS 2008 include salary information for the teachers sampled. While, country level salary information may be obtained this figure is not appropriate to use as a control because it lacks within country variation and is thus essentially a constant in the within country regressions.

4.5 Directions for Future Research

Some of the limitations mentioned may be addressed in future work in one of two ways. First, the use of qualitative fieldwork may provide valuable insight into the satisfaction-leadership relationship by adding finer grained level of information at the teacher level not generally available through survey data.

Second, the use of sub-scales measuring the satisfaction construct rather than a single measure of satisfaction as used in this analysis may facilitate a more nuanced understanding of teacher satisfaction.

Third, this study indicated that teacher efficacy is positively correlated with teacher satisfaction even after controlling for a range of student, teacher, school, and organizational variables. Building on this result, research into the processes by which teacher efficacy may influence teacher and student outcomes may be quite valuable for leaders attempting to improve school effectiveness.

Fourth, we know from chapter 1 that satisfaction is a known antecedent of teacher turnover, student achievement and teacher commitment. Future research could also pursue an exploration of the pathways by which teacher satisfaction may influence these other more distal outcomes.

Additionally, given the apparent importance of the school infrastructure variable noted in other studies (Kloep & Tarifah, 1994; Rogers-Jenkinson & Chapman, 1990; Sargent & Hannum, 2005) a fruitful area of future research would be to analyze the role of school infrastructure vis-à-vis teacher outcomes in the developing country context.