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Meta-analysis of Transformational School Leadership Effects on School Outcomes in Taiwan and the USA

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Researchers have suggested that transformational leadership is an important aspect of effective schools; however, whether the effects vary across related studies and the robustness of the overall effect size remain unclear. A meta-analysis technique was used to synthesize the results of 28 independent studies and to investigate the overall relationship between transformational school leadership and three measures of school outcomes. The study found that, in terms of the mean effect sizes, transformational school leadership does have positive effects on teacher job satisfaction, school effectiveness perceived by teachers, and student achievement.

Key words: transformational leadership, school outcomes, meta-analysis

Introduction

During the last three decades, there has been a growing body of research dealing with transformational leadership. Initially outlined by Burns in his book of 1978, the theory of transformational leadership was reconceptualized and developed by Bass. Bass views transformational leadership as an expansion of traditional leadership that goes beyond simple exchange rewards and promises of reward for effort (Bass, 1985). Rather than focusing just on the leader or on the follower, transformational leadership examines the relationship between leader and follower and considers that by engaging the higher needs of the followers, instead of merely working for the greater good, the followers become self actualizing and finally grow to be leaders themselves.

Theoretically, the concept of transformational leadership redefines the vision and mission of an organization by proposing that leadership is not just a set of behavior or traits of an individual but a process whereby the individual interrelates with the organization as a whole. Transformational leadership is a process to shape and elevate goals and abilities so as to achieve significant improvements through common interests and cooperative actions (Bennis & Nanus, 1985).

Transformational school leaders, in a practical context, believe that the participants in the organization constitute resource rich in ideas and knowledge whose power can be tapped by creating motivating school environments. By encouraging the constant growth and participation of the followers, school members, such as teachers may develop new roles and skills required for a process of building human capital in the organization (Owen, 1998; Sergiovanni, 1995).

Empirical research has chiefly tested models of transformational and transactional leadership by using the Multifactor Leadership Questionnaire (MLQ). Developed by Bass in 1985, the MLQ includes items describing leader behavior and measures various aspects of transformational leadership (Avolio, Bass, & Jung, 1999). Bass (1985) originally identified four components as measured by the

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MLQ that are known as the four "Is": idealized influence, inspirational motivation, intellectual stimulation, and individual consideration. The component of idealized influence and inspirational motivation were combined into a single charismatic inspirational dimension which encompasses the quality as the charismatic leaders who can motivate and inspire people in an organization by providing meaning and enthusiasm for a vision of the future.

Premised on the conception of transformational leadership, this article first presents the conceptual background and beliefs of transformational leadership developed by Bass and other researchers. It is followed by a review of the literature on the relationship between the transformational leadership of school leaders and measures of school outcomes including teacher job satisfaction, school effectiveness perceived by teacher, and student achievement. Next, the specific research questions are presented followed by an outline of the methodology of the meta-analysis, findings of the study, and a discussion of the results.

Effects of Transformational School Leadership

Literature relevant to relationships between transformational school leadership and the three measures of school outcomes that are central to the theoretical analysis in the study are discussed in this section.

As a whole, transformational leadership has been shown to be effective for obtaining superior performance, a higher perception of the leader's effectiveness by subordinates, more subordinate satisfaction, and a greater willingness by the subordinates to make extra effort for the leader (Hater & Bass, 1988; Hoernemann, 1998; Howell & Avolio, 1993; Philbin, 1997). Studies by Blasé (1990) and Thurston, Clift, and Schacht (1993) also support transformational leadership as an effective approach for school principalship.

Furthermore, principals of effective and exemplary schools were described as transformational leaders (Kendrick, 1988; Liontos, 1993; Rodgers, 1994; Sagor, 1992). Principal leadership was related to certain attributes of effective schools, namely, increased student achievement (Kendrick, 1988; Liontos, 1993; Sagor, 1992); declining drop out rates (Liontos, 1993); high student and faculty morale (Sagor, 1992); and improved school climate (Kendrick, 1988).

A number of researches produced in the second half of the 1990's were systematically conducted to examine the influences of transformational school leadership on teacher behavior and school effectiveness. For example, a review of twenty empirical studies on transformational school leadership offers modest amounts of evidence for the contributions of such leadership to student participation in school with a variety of psychological teacher states mediating student learning such as professional commitment, job satisfaction (Leithwood, Tomlinson, & Genge, 1996). It was also found that organizational commitment and perceptions of school environment are significantly and positively associated with transformational leadership.

Using vocational administrators as the study sample, Daughtry and Finch (1997) conducted a study in which they addressed the leadership effectiveness of vocational administrators as a function of leadership style. Their results revealed that transformational leaders were more effective than those who had other types of leadership styles. Additionally, significant correlations exist between transformational leadership factors and perceived effectiveness. Similarly, in his research, Masi (2000) contended that there is a significant relationship between transformational leadership and motivation, together with the negative relationships between transactional leadership and both commitment to quality and organizational productivity.

In an effort to identify how to create and sustain teacher efficacy, Hipp (1997) found that transformational leadership had a great impact on teacher efficacy. Hipp found that those principals who believed in teacher capacity, promoted teacher empowerment, recognized the accomplishments of teachers, provided support, managed student behavior, and promoted a sense of community, had a great impact upon teacher efficacy. Moreover, data analyzed by multiple regression analysis revealed that there is a statistically significant relationship between leadership styles and teacher satisfaction, teacher perceptions of effectiveness, and teacher willingness to exert extra effort (Small, 2003).

Based on a chosen population of 500 teachers and principals, Martino (2003) found that there was a significant correlation between transformational leadership style and job satisfaction but also found that no significant correlation existed between leadership style and teacher empowerment. On the other hand, in the same year, Dono-Koulouris (2003) indicated that there was a significant correlation between transformational leadership and two aspects of teacher empowerment (status and professional growth) as well as between transformational leadership style and job satisfaction. Study results from Gunigundo (1998) indicated that both principal leadership style and student SES were not significant predictors of student academic achievement in schools.

Layton (2003) concluded that the transformational leadership of middle school principals in Indiana was not found to be linked to increased student learning measured by Indiana's achievement tests. Nevertheless, it was found that transformational leadership was related to teacher satisfaction, perception of principal effectiveness, and the willingness of teachers to give extra effort. Similar results also were found from the study of Niedermeyer (2003).

In sum, one may notice that studies of principal transformational leadership lack consistent quantitative evidence of a significant impact on student achievement. While studies suggested that there are significant relationships between principal leadership and student academic achievement when teachers evaluate the transformational leadership of their principals (Edington & Di Benedetto, 1988; Sillins, 1993), or proposed that student achievement can be linked to transformational leadership of school principals (Leithwood, 1994; Sergiovanni, 1990), not all studies concluded that principal leadership has a direct affect on student learning. For example, Valente (1999) suggested that the leadership of principals does not have a statistically significant affect on student test scores. Barnett and his colleagues (1999) reported that transformational leadership behaviors, such as 'vision' even had a negative impact on intrinsic motivation for learning. Additionally, Hoernemann (1998) found that transformational leadership was not linked to increased student learning as measured in performance in annual achievement tests in Indiana State regardless of schools' contextual factors. However, another study conducted in Indiana indicated that transformational leadership was linked to increased student learning in the highest strata of SES but not in the lowest strata of contextual factors (Philbin, 1997).

Additionally, it was found that few meta-analysis studies have been done in this area. A rare meta-analysis study conducted by Witziers, Bosker and Kruger (2003) examined to what extent of educational leadership (including the concept of transformational leadership) affect student outcomes among multinational research reports. Positive effects were found between educational leadership and student outcomes.

Despite the inconsistency, there is still considerable evidence that transformational leadership is an important aspect of effective schools. Most studies have demonstrated that transformational school leadership is positively related to indicators of leadership effectiveness or educational outcomes including follower satisfaction, motivation and student performance. However, the question as to whether the effect sizes vary across related studies as well as questions surrounding the robustness of the overall effect size remain unanswered.

Purpose of this Study

In an initial step toward addressing these questions, this article aims to investigate the effects of transformational school leadership on three measures of school outcomes (teacher job satisfaction, school effectiveness as perceived by teachers, and student achievement) used as dependent measures in selected studies. The study reported here used a quantitative meta-analysis to estimate the effect size of transformational leadership on measures of school outcomes among multinational research reports. The study also included consideration of which study descriptors (such as school type) might account for any variation in effect sizes.

Selection of Studies

The major function of meta-analysis is to convert diverse outcome measures derived from different researches into a common standardized scale that can be combined for analysis. Studies can present results that are produced by many different statistical tests, such as means, variances, and correlations. The studies used in this meta-analysis are studies using quantitative designs that focus on the effects of transformational leadership on school outcomes. The criteria for inclusion in this study were as follows:

1. Quantitative results of transformational school leadership and measures of school outcomes including teacher job satisfaction, school effectiveness as perceived by teachers, and student achievement.
2. Use of MLQ as an instrument to measure school transformational school leadership.
3. Sample size of at least 40 subjects.
4. Release date of studies of 1990 or later.
5. Statistical data to include sample size, Pearson *r* or t value or F value for calculation of the effect size.

A search of databases containing abstracts and contents of empirical studies related to transformational leadership and school outcomes was conducted. The keywords used in searching the studies were 'transformational leadership', 'job

satisfaction', 'school effectiveness', 'student achievement', and 'school outcomes'. Rosenthal (1984) has indicated that the effect sizes favoring the experimental treatments were greater among published research. Accordingly, it was necessary to make a special effort to locate research that was not published. In this study, both published and unpublished, electronic database searches and manual searches were conducted. Unfortunately, only a small number of published papers met the criteria for inclusion in this meta-analysis because of either inadequate or insufficient reporting of statistics such as the value of Pearson *r* or correlation matrix that were needed for calculation of effect sizes.

In consequence, studies analyzed in this study were collected mainly from two electronic databases: the Taiwan Dissertation and Thesis Abstract System and the ProQuest. The former is sponsored and maintained by the central government of Taiwan; the latter is a database for information about doctoral dissertations and master's theses from over 1,000 graduate schools and universities.

Studies were collected from the United States as well as Taiwan. Taiwan presents a unique opportunity to study the relationship between transformational school leadership and school outcomes since transformational leadership is a relatively new phenomenon in a traditionally centralized educational system that is undergoing major reforms toward a deregulation of school bureaucracy. In the past ten years, Taiwan has played a major role in educational reform in East Asia. Since 1999, principles of elementary and secondary school in Taiwan are selected by a committee constituted of members of parents, teachers, ex-principles and scholars and no longer controlled by the local government. Additionally, the employment and dismissal of teachers are decided by a separate Teacher Evaluation Committee of each school. Considering the above, currently the administrative and leadership patterns of Taiwan are rather more 'Americanized' when compared with other countries in the East Asia.

In this study, by searching of databases containing contents of empirical studies related transformational leadership and school outcomes, it was found that teacher job satisfaction, teachers' perceptions of school effectiveness and student achievement were three of the most commonly used variables to assess school outcomes. In total, 28 studies met the criteria for inclusion in the following meta-analysis. They were acquired in full text and reviewed. Among them, 21 studies provide an explicit measure of the association between transformational leadership and teacher job satisfaction; 13 between transformational leadership and school effectiveness as perceived by teacher; and 11 between transformational leadership and student achievement.

Statistical Procedure

Meta-analysis is utilized because that it can, as a secondary analysis, provide additional information by integrating statistically the quantitative results of primary research (Rosenthal, 1984). The essence of meta-analysis is the conversion of diverse outcome measures into a common standardized scale that can be combined for analysis. To permit comparability across studies, the results of each study were converted to a standardized effect size. Hedges and Olkin (1985) referred to effect sizes derived from different scales of measurement as a scale-free index of effect magnitude. The results can be combined meaningfully in statistical analysis. The software used for analysis in this study was the Comprehensive Meta-Analysis Version 2 (Borenstein, Hedges, Higgins, & Rothstein, 2005).

Lipsey and Wilson (2001) have provided a list of the research finding forms that can be represented with effect size statistics. They include a central tendency description, pre-post contrasts, group contrasts, and association between variables. In this study, all the selected studies belong to the category of correlational research that examines the covariation between two continuous variables (e.g., transformational school leadership vs. student achievement) to determine if there is an association between them.

To investigate the effect of transformational school leadership, Fisher's Zr transformation of the correlation coefficient was used. When the research findings involve bivariate relationships in which both the variables are continuous, the product-moment correlation coefficient is the straightforwardly appropriate effect size statistic (Lipsey & Wilson, 2001). The correlation coefficient is already a standardized index and therefore is usable as an effect size statistic in its raw form even if the variables being correlated are differently operationalized. Fisher's Zr transformation can be defined as

$$ES_{zr} = 0.5\log(\frac{1+ES_r}{1-ES_r})$$

where r is the correlation coefficient, and ES_{zr} is the corresponding individual or mean Zr-transformed correlation. Expressed in the forms we have used for other effect size statistics, the correlation coefficient can be presented as an effect size statistic. From a statistical perspective, effect size values based on larger samples are more precise estimates of the corresponding population value than those based on

smaller samples. Once the Fisher's Zr was calculated, the next step was to measure the actual weights based on the inverse of the standard error value of the squares to produce the inverse variance weight. For convenience in conducting some of the analyses, the researcher may use a Zr-transformed version of this effect size statistic, then convert the results back into regular correlation coefficients for interpretation.

Once the effect size value (mean r) is calculated, the next step needed is to put the effect sizes into some interpretable context. There are various ways to do this but none is completely satisfactory. In this study, a widely used convention for appraising the magnitude of effect of sizes as established by Cohen (1988) was utilized. Cohen reported his general observation that correlation effect sizes fell into the following three ranges: (1) small, when r < = .10; (2) medium, when r = .25; (3) large, when r >= .40.

After the values of r have been estimated, the next question to ask is whether the various effect sizes that are averaged into a mean value all estimate the same population effect size (Hedges & Olkin, 1985). Statistically, it is a question of the homogeneity of the effect size distribution. In a homogeneous distribution, an individual effect size differs from the population mean only by sampling error. In contrast, if the statistical test rejects the null hypothesis of homogeneity, such a result thus indicates that each effect size does not estimate a common population mean. In other words, there are differences among the effect sizes that have some source other than subject-level sampling errors, perhaps

Table 1

Correlations of Transformational Leadership and Teacher Job Satisfaction in the Meta-Analysis

Studies	Year	*N*	Country	Type of School	Teacher Job Satisfaction	
					ES_r	ES_{zr}
Chu	1993	627	Taiwan	Secondary	.600	.693
Liao	1997	117	Taiwan	Elementary	.580	.662
Philbin	1997	218	U.S.	Elementary	.724	.916
Hoernemann	1998	468	U.S.	Secondary	.880	1.375
Chiou	1999	915	Taiwan	Secondary	.670	.810
Palczewski	1999	495	U.S.	Secondary	-.060	-.060
Tsai	1999	875	Taiwan	Secondary	.616	.718
Wu	2000	666	Taiwan	Elementary	.613	.713
Chang	2001	761	Taiwan	Elementary	.694	.855
Liang	2001	686	Taiwan	Elementary	.880	1.375
McAdam	2002	146	U.S.	Elementary	.720	.907
Wang	2002	318	Taiwan	Secondary	.570	.647
Chang	2003	688	Taiwan	Secondary	.572	.650
Dono-Koulouris	2003	42	U.S.	Elementary	.505	.555
Fisher	2003	640	U.S.	Elementary	.876	1.358
Layton	2003	478	U.S.	Secondary	.846	1.241
Martino	2003	381	U.S.	Elementary	.430	.459
Niedermeyer	2003	403	U.S.	Elementary	.620	.725
Small	2003	253	U.S.	Elementary	.820	1.156
Stobaugh	2003	340	U.S.	Elementary	.950	1.831
Wang	2003	525	Taiwan	Elementary	.666	.803

differences associated with differences in study descriptors.

In this article, two study descriptors, school type (elementary and secondary) and study nation (the USA and Taiwan), were tested followed by the significance test of the *Q* values. The rejection of homogeneity, a significant value of *Q*, means that the variability across effect sizes is greater than expected from sampling error alone (Lipsey & Wilson, 2001). In this study, excess variability is assumed to be either zero or completely systematic, that is, associated with study descriptors in the meta-analysis (fixed effects model). Since

Table 2

Correlations of Transformational Leadership and School Effectiveness as Perceived by Teachers in the Meta-Analysis

Studies	Year	*N*	Country	Type of School	Effectiveness	
					ES_r	ES_{zr}
Philbin	1997	218	U.S.	Elementary	.604	.699
Hoernemann	1998	468	U.S.	Secondary	.857	1.281
Tsai	1999	875	Taiwan	Secondary	.677	.823
Wu	2000	666	Taiwan	Elementary	.627	.736
Chang	2001	761	Taiwan	Elementary	.797	1.090
Lin	2001	219	Taiwan	Secondary	.219	.222
Lin	2002	521	Taiwan	Elementary	.350	.365
McAdam	2002	146	U.S.	Elementary	.710	.887
Wang	2002	318	Taiwan	Secondary	.318	.329
Niedermeyer	2003	403	U.S.	Elementary	.670	.810
Small	2003	253	U.S.	Elementary	.710	.887
Stobaugh	2003	340	U.S.	Elementary	.940	1.738
Wang	2003	525	Taiwan	Elementary	.733	.935

Table 3

Correlations of Transformational Leadership and Student Achievement in the Meta-Analysis

Studies	Year	*N*	Country	Type of School	Student Achievement	
					ES_r	ES_{zr}
Gunigundo	1998	1,153	U.S.	Elementary	.030	.030
Tsai	1999	875	Taiwan	Secondary	.429	.458
Wu	2000	666	Taiwan	Elementary	.363	.380
Chang	2001	761	Taiwan	Elementary	.494	.541
Wang	2002	318	Taiwan	Secondary	.318	.329
Chang	2003	688	Taiwan	Secondary	.497	.545
Fisher	2003	640	U.S.	Elementary	.893	1.436
Layton	2003	478	U.S.	Secondary	.843	1.234
Nicholson	2003	114	U.S.	Secondary	.010	.010
Stobaugh	2003	340	U.S.	Elementary	.280	.287
Wang	2003	525	Taiwan	Elementary	.525	.583

the study descriptors analyzed are categorical variables, a method analogous to the ANOVA was utilized to model the systematic variance in effect sizes.

Results of the Meta-analysis

This section reports the results of meta-analysis conducted to answer the following two major questions.

Question 1: How much of the effect in transformational school leadership is accounted for by school outcomes in term of teacher job satisfaction, school effectiveness as perceived by teachers, and student achievement?

Three separate meta-analyses were performed to explore the overall relationship between transformational school leadership and measures of school outcomes. From the studies included in Table 1, twenty-one effects sizes representing the relationship between school transformational leadership and teacher job satisfaction were analyzed. The mean of the 21 effect sizes（r） was .707 with the range -.060 to .950. From the studies included in Table 2, 13 effect sizes representing the relationship between transformational school leadership and school effectiveness as perceived by teachers were analyzed with a mean of .695 and the range .219 to .940. Table 3 includes 11 effect sizes related to the relationship between school transformational leadership and student achievement with a mean of .487 and the range .010 to .893.

The results of estimated effect size from the three meta-analyses in terms of r indicated that transformational school leadership does have a positive and significant effect on teacher job satisfaction （r =.707）, school effectiveness as perceived by teachers（r =.695）, and student achievement（r =.487）. It can be concluded that the overall relationship between school transformational leadership and measures of school outcomes seems fairly robust. In Cohen's terminology, the values of three mean effect sizes all demonstrate high effect. The results also indicate that 49.98%, 48.30%, and 23.81% of variance in teacher job satisfaction, school effectiveness perceived by teacher, and student achievement are associated with differences in transformational school leadership.

Question 2: With reference to the total variation in transformational school leadership as accounted for by measures of school outcomes, are there study descriptors that might account for the variation in effect sizes?

The above question concerns a need to analyze whether effect sizes vary across studies. The rejections of the null hypothesis of the homogeneity indicate that there are differences associated with different study descriptors. In other words, there may be independent variables that have profound influences on the estimated effect sizes. Results from Table 4 indicated that all three Q values are significant. Followed by the rejection of homogeneity, analyses dealing with bivariate relationships between study descriptors (school type and study nation) were conducted. The results and effect sizes generated from transformational school leadership with job satisfaction, school effectiveness as perceived by teachers, and student achievement are presented respectively in Table 5 and Table 6.

Statistically, an approach of analog to the ANOVA was used in this study to test the ability of a categorical variable (such as type of school in this study) to explain the excess effect sizes variability. Total variability was divided into the portions explained by the categorical variable (QB) and the residual portion (Q_W). Both were distributed as a chi-square, the former is an index of the variability between the group means with the degrees of freedom of the number of categories minus 1; the latter is an index of the variability within the groups with the degrees of freedom of the number of effect sizes minus the number of categories. If significant variability can be explained by the study descriptors, then the mean effect sizes across categories differ by more than sampling errors.

The results indicate that in terms of effect sizes, both school type and study nation, serving as study descriptors in this study, show significant results (significant values of Q_B). However, even though significant, the results are not altogether consistent in direction. For example, the effect sizes in elementary schools are significantly higher than the effect sizes in secondary schools from studies related to transformational leadership with teacher job satisfaction as well as school effectiveness as perceived by teachers. However, studies of transformational leadership and student achievement show that the effect sizes in secondary schools are significant higher than those in elementary schools. In addition, all the studies conducted in Taiwan have lower average effect sizes than those in the United States. The findings of question 1 and 2 are summarized in Table 7.

Table 4
Meta-analytic Results of Homogeneity Analysis

	k	N_{total}	$\overline{ES}_r$	Q
Job Satisfaction	21	10,042	.707***	1458.392***
School Effectiveness	13	5,713	.695***	707.110***
Student Achievement	11	6,558	.487***	1129.533***

*** p <.001

Table 5
Meta-analytic ANOVA for School Type

	Q_B	Q_w	Q_{total}	Elementary $\overline{ES}_r(k)$	Secondary $\overline{ES}_r(k)$
Job Satisfaction	151.412***	1306.980	1458.392	.762***(13)	.637 ***(8)
School Effectiveness	14.912***	692.199	707.110	.713***(9)	.655***(4)
Student Achievement	15.522***	1114.011	1129.533	.458***(6)	.534***(5)

*** p <.001

Table 6
Meta-analytic ANOVA for Study Country

	Q_B	Q_w	Q_{total}	Taiwan $\overline{ES}_r(k)$	U. S. $\overline{ES}_r(k)$
Job Satisfaction	71.336***	1387.055	1458.391	.672*** (10)	.756*** (11)
School Effectiveness	166.024***	541.086	707.110	.629*** (7)	.803*** (6)
Student Achievement	22.684***	1106.849	1129.533	.449*** (6)	.539*** (5)

*** p <.001

Table 7
Summary of Meta-analysis

	Job Satisfaction	School Effectiveness	Student Achievement
$\overline{ES}_r$	.707	.695	.487
School Type	Elementary>Secondary	Elementary>Secondary	Secondary >Elementary
Study Country	U.S. > Taiwan	U.S. > Taiwan	U.S. > Taiwan

Discussion and Conclusion

As mentioned before, researches regarding school leadership and school outcomes have shown contradictory results. While some researchers found that school leadership has significant influences on school outcomes, others indicated no effects of leadership on school outcomes. However, the statistical results of the meta-analysis in this study suggest that the direct effects of transformational leadership on school outcomes, including teacher job

satisfaction, school effectiveness, and student achievement, are significant and positive. In other words, a high degree of transformational leadership is seen as superior by the school teachers in promoting satisfaction with the leadership of the principal, causing a heightened perception of effectiveness as perceived by teachers, and producing a higher student achievement.

These findings are consistent with the results of other researches (Avolio, Bass, & Jung, 1999; Erez, 1987) that indicated leaders, who show understanding and take an individual interest in teachers, and who are proactive, produced positive results for teachers such as greater satisfaction and higher school effectiveness as perceived by the teachers.

Based on these findings, principals who wish to influence school outcomes should assess their leadership styles and set goals for higher levels of the dimensions (such as idealized influence, inspirational motivation, intellectual stimulation, individual consideration) of transformational leadership as identified by the MLQ. As Leithwood (1992) has indicated, transformational leaders are sensitive to organization building, developing a shared vision, distributing leadership, and building the school culture necessary to accomplish the current restructuring effects in schools. Exhibiting transformational leadership behaviors will help principals establish constant and sustained reform in their schools. Leithwood and Jantzi (1999) also found that transformational leaders work with teachers in groups in order to develop better solutions to immediate problems, stimulate a greater commitment to the goals of the school and contribute to the long-term growth of the problem solving capacities of teachers.

In practice, since measures of school outcomes and transformational leadership are positively related with one another, there is strong support for the idea that teaching and training in transformational leadership behaviors as a part of professional development is well justified for current and aspiring principals. Such preparation can lead to an increase in the number of schools that will benefit from the principals' transformational leadership. Additionally, it seems to be appropriate to place some emphasize on the transformational leadership literature in the training courses of colleges and universities for all educational administrators.

In this study, analyses in which differences between countries are modeled give consistent indications that transformational leadership matters less in Taiwan than in the United States. Bass (1998) has found that transformational leadership is more likely to emerge in settings that are unstable, uncertain and turbulent in nature. This finding may explain why studies conducted in Taiwan have smaller average effect sizes than studies conducted in the United States. As mentioned earlier, the educational and school systems have been highly centralized in the past half of the century while transformational leadership is a relatively new phenomenon in the educational settings of Taiwan. When compared to their American counterparts, the homogeneous nature of the school settings of Taiwan may have been a factor that contributed to the smaller average effect sizes. Although the government of Taiwan has tried to deregulate the school bureaucracy, the tradition of homogeneity among public schools, their staff and administration may still have influenced the effects of transformational leadership on school outcomes.

In this study, the effect of transformational leadership on student achievement was found to be relatively smaller than teacher job satisfaction and student achievement when the contextual factors, such as student SES and the attitudes of the community, are playing positive roles. Where a stable educational environment exists and school education is valued by the people of the community, the effects of transformational leadership on student achievement are more measurable and incremental. For example, Hoy and Hannum (1997) indicated that principal effects are mediated by four crucial organizational properties that include internal pressure for academic achievement, community pressure for achievement, commitment of teachers, and resource support. They are key ingredients that influence independently as well as collectively student achievement. Statistically, the homogeneity of contextual factors among the studies analyzed in the meta-analysis might influence the effect sizes between transformational leadership and student achievement.

Finally, it should be remembered that the correlation coefficients between transformation and other dependent variables such as teacher job satisfaction are measured and calculated based on the perceptions of teachers. If the perceptions of teachers are somehow tied to the surrounding environment (such as school culture), the use of Pearson correlations may have underestimated or overestimated the relationship between transformational school leadership and related dependent variables. Further research is recommended to include situational factors in order to provide a more complete picture of school transformational leadership and how it influences others involved in the functioning of a school.

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