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INCREMENTAL VALIDITY OF THE DISTRIBUTED LEADERSHIP SCALE

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ABSTRACT

The present study explored the incremental validity of distributed leadership. We measured a goodness-of-fit model for distributed leadership; analyzed the discriminant and concurrent validities for distributed leadership, participative leadership, and collective leadership; and examined four proposed hypotheses. The study sample consisted of 557 vocational high school faculty members from Taiwan. Five different scales for each leadership type, overall job satisfaction, and affective commitment were used. Confirmatory factor analysis (CFA), χ^2, and hierarchical regression were used to analyze the data. There were four major findings. The distributed leadership scale demonstrated excellent goodness of fit for the model. All leadership types had discriminant validity. All aspects of each type of leadership were significantly correlated with outstanding concurrent validity. Finally, empirical support was found for all four proposed hypotheses.

Keywords: Distributed Leadership, Incremental Validity, Scale Development

INTRODUCTION

In preliminary research for this study, we developed a scale of distributed leadership (see Appendix 1) from organizational theories. This provided conceptual validity for a distributed leadership scale. This scale has three dimensions, each consisting of two factors: autonomy and participation (including the factors work autonomy and decision-making participation), self-management teamwork (team building and team sharing), and mutual beneficial relationship (economic support and emotional support). All relevant indexes acquired from the results of exploratory factor analysis and confirmatory factor analysis met satisfactory criteria, indicating sufficient validity of the scale to justify further verification.

Our goal was to determine if this scale could have concurrent validity and discriminant validity at the same time, that is, to verify its incremental validity. To this end, we measured a goodness-of-fit model for distributed leadership; analyzed the discriminant and concurrent validities for distributed leadership, participative leadership, and collective leadership; and examined four proposed hypotheses. The following four hypothesis were tested: participative leadership has a significant and positive effect on job satisfaction and organizational commitment; collective leadership has a significant and positive effect on job satisfaction and organizational commitment; distributed leadership has a significant and positive effect on job satisfaction and organizational commitment; and (4) distributed leadership has a significant and positive effect on job satisfaction and organizational commitment, when controlling for participative leadership and collective leadership.

LITERATURE REVIEW

Participative Leadership, Job Satisfaction, and Organizational Commitment

Participative leadership is defined as leadership behavior under rational guidance and certain norms, which allows followers to enact autonomous, self-motivated, and spontaneous efforts. Given that participative leadership is achieved by collective discussion and joint decision-making, faculty leaders might encourage members to be actively involved in decision-making processes, which in turn could produce higher job satisfaction (Kim, 2002; Sosik, Avolio, & Kahai, 1997, 2004). Conversely, as faculty are subjected to policy constraints and curriculum control, their autonomy and level of job satisfaction drops (Archbald & Porter, 1994).

A number of empirical studies have suggested that participative leadership can have a significantly positive relationship with job satisfaction and organizational commitment ($r = .43$, $p < .05$; $r = .50$, $p < .05$) (Mulki, Jaramillo & Locander, 2006). A significantly positive relationship between work autonomy and decision-making participation with organizational commitment has also been demonstrated ($r= .54$, $p < .01$, Somech & Bogler, 2004; $r = .36$, $p < .05$; $r = .37$, $p < .05$, Somech & Bogler, 2004; $r = .55$, $p < .001$) (Hulpia, Devos & Van Keer, 2011). Lastly, some studies have found that faculty work autonomy has a significant and positive effect on job satisfaction ($\beta = .25$, $p < .05$) (Skaalvik & Skaalivik, 2007). The following hypothesis was derived from these findings:

Hypothesis one: participative leadership has a significant and positive effect on job satisfaction and organizational commitment.

Collective Leadership, Job Satisfaction, and Organizational Commitment

Collective leadership is a type of strategic leadership (Denis, Lamothe & Langley, 2001). Under collective leadership, decision-making is achieved through collective responsibility, not solely decided by any one individual. Collective leadership includes planning and organizing, problem solving, providing support to other decision makers, developing the ideas of others, and mentoring new team members. (Hiller, Day & Vance, 2006). Because collective leadership can forge high cohesion among members of an organization, such members may have a higher degree of job satisfaction and commitment (Friedrich, Vessey & Schuelke, et. al. 2009). Moreover, collective leadership may positively influence decisions regarding work objectives and increase work motivation, while indirectly motivating subordinate achievement (Leithwood & Mascall, 2008). Nevertheless, empirical studies supporting these assertions are generally lacking in the literature.

Like participative leadership, collective leadership has been found to have a significant and positive influence on job satisfaction and organizational commitment. Collective leadership features a collective efficacy (Goddard, Hoy & Hoy, 2000) in which each team member's expertise is used to analyze problems; that is, members' individual abilities are merged to achieve commonly shared goals (Bandura, 1997). Klassen (2010) confirmed a significantly positive relationship between collective efficacy and member work attitude.

Collective leadership may also augment patience among team members by fostering a collective team atmosphere and encouraging members to listen to each other (Skaalvik & Skaalivik, 2010). Previous studies have confirmed that feelings of belonging driven by team support may lead to more job satisfaction and reduced impetus to leave the faculty. Finally, collective leadership is also capable of fostering the exchange of career advice between team members, and providing

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positive role models to new team members (Hargreaves, 2005). Colleagues can have a significant and positive effect on the socialization of new faculty by supporting career development in initial work stages, and influencing the working attitude of new faculty. Therefore, we predicted that collective leadership would also have a positive effect on faculty job satisfaction and commitment. We proposed the following hypothesis:

Hypothesis two: collective leadership has a significant and positive effect on job satisfaction and organizational commitment.

Distributed Leadership, Job Satisfaction, and Organizational Commitment

Under distributed leadership, activities are scattered across members within the organization. It is an organizational atmosphere built on members' perception of and participation in leadership practices. Given that distributive leadership includes attributes of participative leadership (Gibb, 1958) it can similarly have a positive effect on job satisfaction, organizational commitment, and working attitude. Distributive leadership encourages faculty involvement in organizational decision-making, while also providing a degree of work autonomy. Work autonomy refers to a feeling that one has control over certain aspects of working life; in the context of educational institutions, this may include scheduling, curriculum development, textbook selection, and instruction planning.

Like collective leadership, distributive leadership is achieved through the cooperation of all team members. The distributed aspect of this approach is fulfilled by collective participation and management, and by establishing institutions that share value frameworks (Liu, Zhang & Wang, 2011). Previous studies have shown a significant and negative relationship between mutual support of team members and intention to leave. Therefore, we may deduce that distributive leadership can have a positive influence on job satisfaction, organizational commitment, and work attitude.

Distributive leadership incorporates relationships between organizations and members that sustain and contribute to the management process. This may also include providing economic assistance and emotional support. In cases when organizations provide their members support in excess of their corresponding contributions, members may have higher job satisfaction and organizational commitment. From a social exchange point of view, as faculty are aware of organizational support, it has a positive effect on job satisfaction and organizational commitment. Meta-analyses have indicated a significant and positive relationship between job satisfaction and organizational commitment, as well as member awareness of organizational support (Riggle, Edmondson & Hansen, 2009). Tekleab and Chiaburu (2011) showed a significant and positive relationship between job satisfaction and organizational commitment, and member support. Based on these findings, we hypothesized that distributive leadership would have a positive influence on job satisfaction, organizational commitment, and working attitude. We also posited that this leadership type would produce incremental validity when compared to participative leadership and collective leadership, because distributive leadership more effectively emphasizes sustaining relationships between organizations and members.

Hypothesis three: distributed leadership has a significant and positive effect on job satisfaction and organizational commitment.

Hypothesis four: after controlling for participative leadership and collective leadership, distributed leadership has a significant and positive effect on job satisfaction and organizational commitment.

RESEARCH DESIGN AND IMPLEMENTATION

Research Objectives and Data Collection

We utilized a random sample of institutions based on the Ministry of Education of Taiwan's 2012 national register of vocational high schools. A total of 23 vocational schools were initially selected according to geographic distribution: 9 schools in the northern region, 4 in the central region, 8 in the southern region, and 2 from the Hualian and Taitung areas. The sampling process also considered whether schools were public or private, resulting in the selection of 14 public and 9 private schools. Schools were also sampled based on category, including 10 commercial vocation schools, 6 agricultural and engineering schools, and 7 in an "other" category. A total of 30 questionnaires were delivered to each school, resulting in a total of 690 distributed questionnaires. This sampling method is robust because it accurately reflects the population structure.

We received 557 valid responses, for a response rate of 80.7%. Basic demographic statistics of our sample were as follows: 53.1% female and 69.7% unmarried, 57.8% held a master's degree and 39.1% held a bachelor's degree, 56.4% were student advisors in addition to teachers and 20.1% were full-time teachers, 27.5% had less than 5 years teaching experience and 22.8% had 5–10 years teaching experience, 62.3% served in public schools, and 32.3% served in schools with a student population between 1001 and 2000 and 18.1% served in schools with a student population between 2001 and 3000. According to the statistical profile of faculty members of vocational high schools for the whole nation, published by the Directorate-General of Budget for Accounting and Statistics of the Executive Yuan in 2012, the gender ratio for faculties is 34 males for every 66 females, the educational credentials ratio is 66 bachelors for every 32 masters and 2 doctorate degrees, and the marital status ratio is 34 married for every 66 unmarried. A chi-squared analysis was used to compare sample ratios to official statistics for gender, educational credential, and marital status. This analysis indicated consistency between our sample structure and that of the overall population.

Research Tools

Scale for Participative Leadership

We adopted the participative leadership scale developed by Arnold, Arad, Rhoades, and Drasgow (2000). The scale consists of six items (α = .94). Because all data in this study was acquired by self-reporting, the scale was fashioned using a Likert seven-point scale to reduce interference from common method variance (CMV). Possible responses ranged from "strongly disagree" to "strongly agree." An example statement follows: "This department (e.g., English Department) is eager to encourage faculty members to express their own perspectives."

Scale for Collective Leadership

We adopted the collective leadership scale developed by Hiller, Day, and Vance (2006). The scale consists of four dimensions and 16 items. The first dimension, Planning and Organizing, consists of four items (α = .88). An example of an item under this dimension is when resource allocation within a department is prioritized based on the teaching demands of faculty. The

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second dimension, Problem-solving, contains four items (α = .95). An example is when a department selects the best action plan to address a given issue. The third dimension, Support and Consideration, has four items (α = .92). An example is when colleagues in a department provide timely assistance to other faculty members needing help. The fourth dimension is Development and Mentoring and consists of four items (α = .91). An example is when a department always encourages faculty to exchange viewpoints garnered from teaching experience. The scale is graded using a seven-point Likert scale ranging from "strongly disagree" to "strongly agree."

Scale for Distributive Leadership

The distributive leadership scale was developed during preliminary research for this study. It includes three dimensions and six items. The first dimension consists of work autonomy and decision-making participation factors. The second dimension consists of team building and team sharing factors. The third dimension consists of economic support and emotional support factors. The work autonomy factor consists of four items (α = .87), e.g., "This school will never intervene too much with faculty class management." Decision-making participation consists of four items (α = .88), e.g., "The faculty at this school have opportunities to be involved with establishing and amending school institutions." The team building factor consists of four items (α = .81), e.g., "The faculty in this school may participate in the discussion of curriculum programming and the design of their own department." Team sharing consists of four items (α = .91), e.g., "The faculty in this school are willing to share their own experiences of class management." Economic support consists of four items (α = .91), e.g., "This school will take the initiative to take care of welfare and benefits for faculty." Finally, emotional support consists of four items (α = .87), e.g., "This school will take the initiative to assist as faculty members require help." This scale is graded using a seven-point Likert scale ranging from "strongly disagree" to "strongly agree." Two questions were negatively worded.

Scale of Overall Job Satisfaction

We utilized the overall job satisfaction scale developed by Brayfield and Rothe (1951). There are a total of five items in the scale (α = .82). For example, "Usually, I am fond of my teaching career." This scale is graded using a five-point Likert scale ranging from "strongly disagree" to "strongly agree." Two questions are negatively worded.

Scale of Affective Commitment

Affective commitment is similar to the concept of organizational commitment in that it indicates feelings of attachment, identification, and involvement of employees in organizations (Meyer, Allen & Smith, 1993; Mowday, Porter & Steers, 1982). Carmeli and Freund (2004) confirmed affective commitment as a significant example of organizational commitment. In the present study, we adopted the affective commitment scale of Meyer, Allen and Smith (1993) for measuring organizational commitment. It consists of six items (α = .88), e.g., "I will be very satisfied should I commit my teaching career to the school where I serve now." This scale is graded using a five-point Likert scale from "strongly disagree" to "strongly agree." Three questions were negatively worded.

ANALYSIS

The first analytical step was to conduct a normality test on the data structure. Test results indicated skewness coefficients between .517 and .157 (< 0.3), and kurtosis coefficients from .838 to .126 (< 0.8). We adopted a maximum likelihood method as the assessment model for further appraisal. This study was conducted in two stages. The first stage built a measurement model for verifying construct validity by confirmatory factor analysis, and selected indexes for measuring a goodness-of-fit model, including the chi-square test (χ^2), non-normed fit index (NNFI), normal fit index (NFI), comparative-fit index (CFI), and root mean square error of approximation (RMSEA). In the second stage, a regression model was conducted by block regression analysis to verify hypotheses 1 to 4 (H1–H4).

RESULTS

Analysis of Measurement Models

Measurement of goodness-of-fit model

We conducted a confirmatory factor analysis on collective leadership and distributive leadership using AMOS to examine construct validity. Measurement model analysis of distributive leadership indicated excellent goodness of fit for our model ($\chi2 = 656.6$, $df = 229$, $\chi2 / df = 2.9$, $p < .001$; CFI = .96, GFI = .94, NNFI = .96, RMSEA = .06 and SRMR = .05). Standardized factor loadings were between .54 and .97. The maximum value of average variances extracted (AVE) was .73 and the minimum value was .56. The maximum constructed reliability value was .91 and the minimum was .83, indicating that the observed indexes contained convergent validity for each latent variable. Measurement model analysis of collective leadership indicated excellent goodness of fit for our model ($\chi2 = 290.51$, $df = 187$, $\chi2 / df = 1.55$, $p < .001$; CFI = .98, GFI = .94, NNFI = .98, RMSEA = .06 and SRMR = .05). Standardized factor loadings were between .54 and .97. The maximum value of AVE for the four variables was .80, and the minimum was .62. The maximum constructed reliability value was .94 and the minimum was .87, both above the proposed cutoff value of .50 (Fornell & Larcker, 1981), indicating that the observed indexes contained convergent validity for each latent variable.

Discriminant Validity

To test whether distributive leadership (DL), collective leadership (CL), and participative leadership (PL) are different constructs, we constructed a three-factor model (DL; CL; PL), a two-factor A model (DL+CL; PL), a two-factor B model (DL; CL+PL), and a one-factor model (DL+CL+PL). These models were examined using a chi-square test to determine which model had a better goodness of fit. Confirmatory factor analysis showed that the goodness of fit for the three-factor model ($\chi2 = 266$, $df = 88$, $\chi2 / df = 3.0$, $NFI = .964$, $NNFI = .967$, $CFI = .976$, $RMSEA = .060$) was better than that of the two-factor A model ($\chi2 = 398$, $df = 90$, $\chi2 / df = 4.4$, $NFI = .947$, $NNFI = .944$, $CFI = .958$, $RMSEA = .078$), two-factor B model ($\chi2 = 596.7$, $df = 90$, $\chi2 / df = 6.6$, $NFI = .920$, $NNFI = .908$, $CFI = .931$, $RMSEA = . 101$), and one-factor model ($\chi2 = 965.3$, $df = 91$, $\chi2 / df = 10.6$, $NFI = .870$, $NNFI = .843$, $CFI = .881$, $RMSEA = .131$).

The results of the chi-square test also indicated obvious differences between the three-factor model and alternative models ($\Delta\chi2 = 132 \sim \Delta\chi2 = 699.3$, $p = < .001$). This indicates that no pairing of any latent constructs is totally identical, proving discriminant validity among the variables (Anderson & Gerbing, 1988). In summary, the three-factor model used in this study

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Vol. 2. No. 1. January 2013

was acceptable, and discriminant validity did exist among different variables. Another supplementary test for discriminant validity is to examine the confidence interval (± two standard deviations) around the variables to determine if it contains a zero value. Previous research has shown that the three pairs of corresponding confidence intervals used in this study do not contain the value zero (Anderson & Gerbing, 1988). Taken together, these data indicate that all of our variables had excellent reliability, convergent validity, and discriminant validity.

Table 1. Discriminant validity analysis of participative leadership, collective leadership, and distributive leadership

	χ2	*Δχ2*	*df*	*χ2 / df*	*NFI*	*NNFI*	*CFI*	*RMSEA*
DL; CL; PL	266		88	3.0	0.964	0.967	0.976	0.060
DL + CL; PL	398	132**	90	4.4	0.947	0.944	0.958	0.078
DL; CL + PL	596.7	330.7**	90	6.6	0.920	0.908	0.931	0.101
DL + CL + PL	965.3	699.3**	91	10.6	0.870	0.843	0.881	0.131

Concurrent Validity

We examined the concurrent validity of the distributive leadership scale by verifying participative leadership and collective leadership. As shown in Table 2, the four dimensions of participative leadership and collective leadership had correlation coefficients ranging from .28 to .62 among the dimensions of distributive leadership. All were significant at the 0.01 level. Among them, team building and team sharing had the highest correlation values of .43 and .62, respectively. The corresponding confidence intervals did not include zero, indicating that a significant and positive relationship exists between collective leadership and participative leadership.

Table 2. Concurrent validity analysis of participative leadership, collective leadership, and distributive leadership

	Work Autonomy		*DM Participation*		*Team-Building*		*Team Sharing*		*Economic Exchange*		*Emotional Exchange*	
	r	95% CI	r	95% CI	r	95% CI	r	95% CI	r	95% CI	r	95% CI
Leadership Participation	0.31**	[.22;.40]	0.31**	[.22;.40]	0.53**	[.45;.60]	0.43**	[.33;.52]	0.31**	[.22;.40]	**0.28****	[.19;.39]
Planning Organizing	0.31**	[.22;.39]	0.34**	[.25;.43]	0.58**	[.50;.65]	0.45**	[.36;.54]	0.39**	[.31;.48]	0.38**	[.29;.46]
Problem-solving	0.34**	[.25;.43]	0.39**	[.32;.47]	**0.62****	[.55;.68]	0.53**	[.43;.61]	0.43**	[.35;.51]	0.40**	[.32;.49]
Support consideration	0.29**	[.20;.39]	0.31**	[.22;.39]	0.52**	[.44;.59]	0.53**	[.43;.61]	0.31**	[.24;.40]	0.34**	[.26;.43]
Master-Pupil Development	0.28**	[.18;.37]	0.36**	[.27;.44]	0.53**	[.46;.60]	0.52**	[.42;.60]	0.38**	[.29;.46]	0.38**	[.29;.46]
	β	t	β	t	β	t	β	t	β	t	β	t

Leadership Participation	.14*	2.14	.02	.37	.11*	2.08	.02	.40	-.04	-.66	-.13*	-2.10
Planning Organizing	.03	.34	.03	.35	.16*	2.48	-.01	-.12	.13	1.80	.18*	2.39
Problem-solving	.26**	2.76	.37**	4.13	.45**	5.90	.24**	2.84	.44**	5.00	.28**	3.11
Support consideration	.01	.08	-.24**	-2.68	-.09	-1.20	.18*	2.25	-.30**	-3.52	-.10	-1.09
Master-Pupil Development	-.06	-.69	.22**	2.61	.04	.51	.15*	1.99	.20*	2.46	.19*	2.28
R^2	.13		.17		.41		.31		.21		.18	
F	15.7		22.7		74.9		48.5		29.2		24.7	

*p < .05; **p < .01
CI: confidence interval

Regression Model Analysis

Verification of Hypotheses One and Two

We adopted a hierarchical regression analysis to test all hypotheses. First, control variables and then independent variables were added to the regression model, to examine whether the measured effect of the independent variables on dependent variables was significant.

Table 3. Regression analysis of participative, collective, and distributive leadership

	Work Satisfaction				*Organizational Commitment*			
	M1	*M2*	*M3*	*M4*	*M5*	*M6*	*M7*	*M8*
Gender	.12**	.10*	.07	.06	.11**	.08*	.06	.04
Marital Status	.04	.02	.02	.03	.09*	.07	.07	.08*
Service Duration	.08	.10*	.10*	.09*	.18**	.20**	.21**	.19**
Ownership	.17**	.17**	.23**	.13**	.04	.04	.10*	.00
Participative Leadership		.22**	-.14*	-.13*		.28**	-.10	-.09
Collective Leadership			.45**	.18**			.48**	.19**
Distributive Leadership				.45**				.48**
ΔR^2	.07	.05	.08	.12	.08	.08	.09	.14
Adjusted R^2	.07	.11	.19	.31	.08	.15	.24	.38
F	11.0	15.2	22.5	37.1	12.3	21.0	29.9	50.0

*p < .05; **p < .01

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As shown in Table 3, participative leadership had a significant positive effect on job satisfaction and emotional commitment (β.22, p＜.01; β＝.28, p＜.01), after controlling for gender, marital status, service duration, and ownership of educational institutions. In addition, collective leadership had a significant positive effect on job satisfaction and emotional commitment (β＝.45, p＜.01; β＝.48, p＜.01). These results support hypotheses H1 an H2.

Verification of Hypotheses Three and Four

When the control variables were excluded, distributive leadership still had significant net explanatory power for both job satisfaction and emotional commitment (β=.45, p＜.01; β＝.48, p＜.01). This result supports hypothesis H3. In addition, there was an effect on job satisfaction (ΔR^2 = .12, p < .01) and emotional commitment (ΔR^2 = .14, p < .01). These findings support hypothesis H4. As seen from these results, distributive leadership has a significant effect on job satisfaction and organizational commitment, but also exhibits incremental validity.

DISCUSSION

Findings and Contributions of this Study

There is dearth of empirical studies on distributive leadership, and consequently a consistent theoretical basis for the distributive leadership construct is lacking. This study represents an extension of previous studies in three ways. First, we adopted organizational theories as the basis for developing a distributive leadership scale. Using EFA and CFA, we concluded that there are six factors in the distributive leadership construct. Second, by verifying the external validity of distributive leadership, with nationwide samples, we confirmed discriminant validity shared by distributive, participative, and collective leadership. Third, our results demonstrate that distributive leadership can have a significant and positive effect on job satisfaction and organizational commitment, and also have an extra interpretational effect, which was shown by controlling for participative leadership and collective leadership in regression models.

Construct of Distributive Leadership

Organizational theories were adopted as the basis for developing a distributed leadership scale and as the basis for constructing validity for distributive leadership. Distributive leadership, as constructed by organizational theories, may include three major distributive relationships: individual vs. work, individual vs. team, and individual vs. organization. The individual-work relationship balances the traditional leadership roles of superior and subordinate with new work concepts in which individuals have work autonomy and are encouraged to participate in organizational decision-making. The individual-team relationship may involve peer-level interaction processes between specific teams. In distributive leadership organizations members operate in a self-management teamwork style. Finally, the individual-organization relationship is a mutually beneficial relationship between individuals and the organization based on a social exchange. In preliminary EFA and CFA analyses leading up to this study, these three major concepts identified six factors of the distributive leadership construct.

Distributive Leadership and Work Attitude

We interpreted and verified our results concerning job satisfaction and emotional commitment. Empirical research on the effect of distributive leadership on work satisfaction and emotional commitment is still quite limited, and most cases examined come from western countries.

Compared to the findings of previous studies, the present research provides reliable interpretative material on the six-factor distributive leadership construct as it corresponds to job satisfaction and emotional commitment. This study also provides a more comprehensive interpretation of job satisfaction, because the six-factor distributive leadership construct was established based on the three distributive relationships: individual-work, individual-team, and individual-organization.

Distributive Leadership, Participative Leadership, and Collective Leadership

This study provides data on the discriminant validity of distributive, participative, and collective leadership. In previous research, collective leadership was recognized as a type of participative leadership. Distributive leadership and collective leadership have been perceived as similar concepts, but empirical research elaborating the differences among these three matters has been lacking. Our results advance this empirical basis. We confirmed that certain overlaps exist between distributive, participative, and collective leadership. For example, the individual-team relationship is highly correlated for both distributive and collective leadership. A higher concurrent validity does exist between these two types, but discriminant validity also exists. Because these three types of leadership originate from different theoretical bases, these findings further extend each of these bases and also help clarify the relationships among them.

Implications for Management

Our results also reveal that the three leadership types (distributive, participative, and collective leadership) do significantly affect the job satisfaction and emotional commitment of faculty. There are certain leadership implications for each type. Empirical studies have demonstrated that distributive leadership is an extension of both the participative and collective leadership concepts. This does not negate the influence of participative and collective leadership towards individual work attitude, but rather emphasizes that organizational management should hold more comprehensive viewpoints towards organizational leadership. Because the individual-work relationship can be seen as the traditional superior-subordinate relationship, leaders of organizations need to provide work autonomy to specific individuals and also encourage participation in organizational decision-making. Second, because differences exist among individuals with complementary functions, faculty leadership needs to enhance individual-team interaction. Finally, under traditional leadership, subordinates view leaders as proxies for the organization, and such proxy relationships are unavoidable in a distributive leadership organization. As a result, managers should also provide economic resources and emotional consideration.

Research Constraints and Directions for Future Research

There are some constraints to the present research. First, this study was based on cross-sectional data, and therefore it cannot be used for causal inferences. Although a causal relationship between distributive leadership and work attitude has been established in previous theories and empirical tests, this study only found that a significant association does exist between distributive leadership, job satisfaction, and emotional commitment. Valid causal reasoning can only be acquired by using an experimental design with a longitudinal approach.

Second, measuring the relationship between distributive leadership and job satisfaction and emotional commitment may still be affected by CMV. The data that we used were self-reported by study subjects. Nonetheless, this approach may still be subject to CMV. To reduce the impact of CMV, a five-point scale and seven-point scale were used for independent variables and

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Vol. 2. No. 1. January 2013

dependent variables, accordingly. Some items were negatively worded. Hannan's one-factor *post hoc* test was adopted to test for the existence of CMV (Podsako, MacKenzie, Lee, and Podsako, 2003). The test showed a total variance of 70.2%. The explained variance of the first factor was 38.1%, illustrating that CMV did not seriously affect the study. When necessary, further measures must be adopted to totally exclude CMV impact.

Third, the sample group for this study was selected from vocational school faculties and thus external validity was constrained. The objective of distributive leadership in an educational context is to cover elementary, junior high, and senior high schools. This study only examined results from teachers in vocational school teachers in Taiwan. Explanatory efficacy will require further verification from other cases because different institutions and organizational climates influence the actions and attitudes of individuals. Further research should not only consider more diverse sample groups, but also incorporate multilevel research design, which would facilitate greater understanding of the results (Bledow, Schmitt, Frese, & Kühnel, 2011; Li, Ahlstrom, & Ashkanasy, 2010).

Correlation Coefficients

All values for means, standard deviations, and correlation coefficients are presented in Table 4. As the results show, four controlled variables and dependent variables satisfied the criteria for a significant and positive correlation ($r = .12$~$.24$, $p < .01$). Therefore, controlling for gender, marital status, service duration, and ownership is essential. Also, there was a significant and positive correlation between distributive leadership and participative leadership ($r = .47$, $p < .01$). There was also a significant and positive correlation between distributive leadership and collective leadership ($r = .58$, $p < .01$), indicating a significant correlation among the three types of leadership. Subsequent analysis also revealed a significant and positive correlation between distributive leadership and job satisfaction ($r = .53$, $p < .01$) as well as emotional commitment ($r = .57$, $p < .01$).

Table 4. Correlation among variables (N=557)

	M	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
1. Gender	.47	.50								
2. Marital Status	1.69	.46	.12**							
3. Serice Duration	2.66	1.41	.09*	.48**						
4. Ownership	.62	.49	.23**	.19**	.26**					
5. Participative Leadership [a]	5.39	1.05	.10*	.05	-.04	.00				
6. Collective Leadership [a]	5.30	.99	.10*	.01	-.08	-.11**	.79**			
7. Distributive Leadership [a]	4.89	.88	.14**	.05	.04	.16**	.47**	.58**		
8. Job Satisfaction [b]	3.71	.73	.17**	.12**	.15**	.22**	.23**	.32**	.53**	
9. Organizational Commitment [b]	3.74	.68	.15**	.20**	.24**	.13**	.28**	.39**	.57**	.68**

*p<.05; **p<.01
a Rating scale: 1=Strongly disagree; 7=Strongly agree
b Rating scale: 1=Strongly disagree; 5=Strongly agree

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Appendix 1. Sample Structure

Category	*Item*	*Quantity*	*Percentage*	*Category*	*Item*	*Quantity*	*Percentage*
Gender	Female	296	53.1	Service Duration	Less than 5 years	153	27.5
	Male	261	46.9		5~10 years	127	22.8
Marital Status	Married	168	30.2		11~15 years	115	20.6
	Unmarried	388	69.7		16~20 years	73	13.1
Education Level	Bachelor	218	39.1		Above 21 years	88	15.8
	Master	322	57.8	Ownership	Private	210	37.7
	Doctorate	11	2.0		Public	347	62.3
Position	Lecturer Only	112	20.1	Scale of Institution	<1000	67	12.0
	Lecture & Advisor	314	56.4		1001~2000	180	32.3
	Advisor & Dept. Head	21	3.8		2001~3000	101	18.1
	Lecturer & Director	68	12.2		3001~4000	89	16.0
	Lecturer & Dept. Head	35	6.3		>4001	120	21.5

CFA

Structure Aspect		α	χ2	df	χ2/ df	NFI	NNFI	CFI	RMSEA	Average Extraction	Composite Reliability
Distributive Leadership	Work Autonomy	0.87	656.6	229	2.9	0.938	0.959	0.959	0.058	0.65	0.88
	Decision-making Participation	0.88								0.68	0.89
	Team Building	0.81								0.57	0.84
	Team Sharing	0.91								0.72	0.91
	Economic Exchange	0.91								0.73	0.91
	Emotional Exchange	0.87								0.56	0.83
Collective Leadership	Planning Organization	0.88	215.5	79	2.7	0.978	0.979	0.986	0.056	0.62	0.87
	Problem Solving	0.95								0.80	0.94
	Supportive Consideration	0.92								0.70	0.91
	Master-Pupil Development	0.91								0.72	0.91