

**The Impact of Transformational Leadership Style of the School Principal
on School Learning Environments and Selected Teacher Outcomes: A Preliminary Report**

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The Impact of Transformational Leadership Style of the School Principal on School Learning Environments and Selected Teacher Outcomes: A Preliminary Report

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The purpose of this paper is to report on an investigation of the relationships between the transformational and transactional leadership behaviours of school principals in New South Wales State secondary schools and some selected teacher outcomes and school learning environment constructs.

A survey was carried out in 52 randomly selected schools involving 458 teachers from across New South Wales. The Multifactor Leadership Questionnaire Form 5X (Short) developed by Bass and Avolio (1997) was used to measure leadership behaviour, while, the School Learning Environment Questionnaire developed by Fraser (1986) was used to assess school learning environment. Factor analysis was used to determine the validity of the leadership model developed by Bass and Avolio (1997) and the school learning environment model developed by Fraser (1986) in the Australian school context. A factor analysis of leadership items suggested that one transformational factor (vision), one transformational / transactional hybrid factor (individualised consideration) and one non-leadership factor (laissez-faire) factor were evident. An analysis of school learning environment items identified seven factors. Four outcome factors were incorporated; overall satisfaction with leadership, perceptions of teacher influence, perceptions of teacher effectiveness, and perceptions of teacher control.

Multilevel modelling analysis was used to explore the relationship between leadership behaviours, school learning environment factors and teacher outcomes. Contrary to what might be expected, results from the analysis of the leadership behaviours factors with teacher outcomes suggested that teacher outcomes like overall satisfaction with leadership is more closely and highly correlated with individualised consideration rather than with vision. Further, the leadership behaviour factors demonstrated differential correlations with each of the school learning environment factors, indicating that principals may target their leadership behaviour to have maximum impact in any effort at modifying school learning environment.

Introduction

Much effective school research over the past two decades has concentrated on examining the relationship between the leadership behaviour of school principals and the enhancement of organisational performance (Shum and Cheng, 1996). Of particular interest have been studies that have highlighted the mediating role principals serve between teachers and learners (Silins and Murray-Harvey, 1999). Interestingly, results from these studies have suggested that principals have the ability to indirectly effect student achievement by improving the tone or learning environment of a school (Johnson, Livingston, Schwartz and Slate, 2000). However, while the concepts of school leadership and school learning environment seem to be intuitively linked, there have been few studies that have related these concepts together (Griffith, 1999).

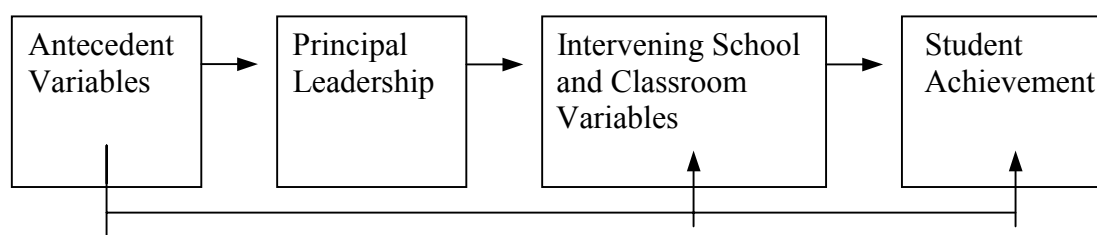
Further, recent paradigm shifts in conceptualising leadership have also encouraged educational researchers to consider these relationships from the perspective of new leadership models. Prominent among them is the transformational and transactional leadership model (Burns, 1978, Bass, 1985, Bass and Avolio, 1994; Leithwood and Jantzi, 1990), which suggests that follower performance can be lifted to beyond what is normally considered to be acceptable (Bass, 1985). Further, transformational leaders are able to manipulate and alter their environmental constraints in order to achieve their performance goals (Kirby, King and Paradise, 1992).

Theoretical Framework

The theoretical framework presented in this paper is based on a mediated-effects model of effective schools as discussed by Hallinger and Heck (1998, p.162). This mediated-effects model provides a more complex representation of administrator effects within schools than does a simple direct effects or a moderated effects approach. It is acknowledged that antecedent variables can have an important causal influence that effect desired outcomes such as student achievement. However, the focus of this study is to examine the relationship between the leadership practices of the principal and school and classroom variables, namely school learning environment and teacher satisfaction.

In this model, the variable of the principal's role is assumed to be both a dependent and an independent factor (Hallinger and Heck, 1998). As a dependent variable, the principal is subject to the influence of external antecedent factors such as socioeconomic status, or prevailing external environment conditions such as technological change. As an independent variable, the principal is considered to be the agent of change, influencing directly the actions of teachers, the learning conditions within the school, and the attainment of outcomes such as teacher job satisfaction and indirectly, student learning outcomes.

Figure 1. Theoretical framework guiding research on leadership, school learning environment and selected teacher outcomes (adapted from Hallinger and Heck, 1998, p.732).



Transformational and Transactional Leadership

Transformational leadership is hypothesised to occur when leaders and followers unite in pursuit of higher order common goals, when "one or more persons engage with others in such a way that leaders and followers raise one another to higher levels of motivation and morality" (Burns, 1978, p. 20). This implies that the leader-follower relationship is one in which the purposes of both become fused, creating unity and collective purpose (Barker, 1990). The leader motivates followers to "work for transcendental goals instead of immediate self-interest, for achievement and self-actualisation rather than safety and security" (Murray and Feitler, 1989, p. 3), and creates within followers a capacity to develop higher levels of commitment to organisational goals (Leithwood and Jantzi, 2000).

Transactional leadership is hypothesised to occur when there is a simple exchange of one thing for another. Burns (1978, p. 19) argued that transactional leadership occurs "when one person takes the initiative in making contact with others for the purpose of exchange of valued things". In this relationship the leader and the led exchange needs and services in order to accomplish independent objectives (Barker, 1990; Kirby, Paradise and King, 1992).

Bass et al. (1997) conceptualised a third type of leadership, laissez -faire leadership, which was hypothesised to occur when there is an absence or avoidance of leadership. In this case decisions are delayed, and reward for involvement absent. No attempt is made to motivate followers, or to recognise and satisfy their needs (Bass and Avolio, 1997).

Transformational leadership models emphasize that "transformational leaders are able to alter their environments" to meet their desired outcomes (Kirby, King and Paradise, 1992, p. 303). Transformational school leaders do this by promoting educational restructuring and innovation, focusing on building vision, encouraging collaborative participation and raising the role of followers to that of leader (Silins, 1994).

School Learning Environment

School learning environment refers to that set of factors that can be regarded as influencing the feel or personality that a school exudes. School learning environment can also be defined as that set of internal characteristics that distinguishes one school from another and influences the behaviour of its members, both staff and students (Hoy and Miskel, 1987).

Fraser (1986) argued that school learning environment factors can operate at both classroom and at school levels. Although both are related, school-level environments are more global. A classroom climate may be limited to involve relationships between student and student and between student and teacher within the boundaries of an individual room.

While not all inclusive, this study seeks to examine those school learning environment constructs identified by Fraser (1986) which operate at the school level rather than the classroom level, namely student supportiveness, affiliation, professional interest, centralisation, formalisation, innovation, resource adequacy and achievement orientation.

The Purpose Of The Study

Recent reviews of research in school leadership have indicated that few studies have examined the effects of transformational and transactional leadership on teacher outcomes such as perceived satisfaction with leadership and perceptions of teacher effectiveness. Even fewer studies have addressed the issue of the effects of leadership behaviour on aspects of a school's learning environment (Griffith, 1999).

Specifically, this paper focuses on examining two leadership behaviours, namely, the dissemination of vision (transformational behaviour) and individualised consideration (a hybrid transformational / transactional behaviour) and their role in influencing teacher perceptions of school learning environment and aspects of teacher job outcomes.

Method

Government schools in New South Wales have been grouped into forty administrative districts, each with its own District Office, District Superintendent and support staff. Schools were randomly ordered within their administrative districts. The first, second and third schools within each district were contacted regarding possible involvement in this study. Of the 117 schools contacted, 52 secondary schools from 31 regions agreed to participate in this study. After data cleaning, the total sample size consisted of 458 staff and 49 principals.

Teacher Demographics

The staff sample size (n=458) consisted of 200 males (43.7%) and 235 (51.3%) females (missing = 23 or 5.0%), the majority of whom (60.0%) were full time teachers. A smaller number (n=132) came from promotions positions held within their schools (28.9%). The majority of respondents (n=340; 74.2%) had more than 11 years teaching experience, and had been in their current school for more than 6 years (49.1%). 291 staff (63.5%) reported teaching within their current principal for more than 2 years.

Instruments

The Multifactor Leadership Questionnaire (5X - Short) (Bass and Avolio, 1997) was used to examine transformational and transactional leadership constructs. Although this instrument reportedly measures 5 transformational and 4 transactional constructs, data analysis, particularly confirmatory factor analysis could only identify one transformational factor, vision and one hybrid transformational / transactional factor, individualised consideration. A non-leadership factor, laissez-faire leadership, was also extracted from the data set.

The School Learning Environment Questionnaire (SLEQ) developed by Fraser (1986) was used to examine eight learning environment constructs. Again, confirmatory factor analysis could only find support for seven of Fraser's (1986) eight original constructs, and included Student Supportiveness, Affiliation, Professional Interest, Centralisation, Innovation, Resource Adequacy and Achievement Orientation.

Four scales were developed to examine selected teacher outcomes. These included satisfaction with leadership (taken from MLQ-5X (Short)), perceptions of teacher effectiveness and perception of teacher influence (taken from Patterns of Adaptive Learning Questionnaire - (Maehr, Midgley, Hicks, Roeser, Urdan, Anderman and Kaplan, 1996)), and perceptions of teacher control (taken from School Learning Environment Questionnaire).

Data Analysis

Data was collected using the MLQ-5X (Short) and SLEQ instruments along with a number of demographic and teacher outcome based questions. Initially the data were screened and examined for outliers and missing data using PRELIS 2.30 (Joreskog and Sorbom, 2001; Rowe, 2000) before fitting explanatory multilevel models. Cases with more than 20% missing data were discarded. The EM method (Joreskog and Sorbom, 2001) of estimation of missing data was employed to impute missing values for the remaining cases, which in total accounted for less than 5% of the data set.

Factor scale scores for each of the variables used in the study were calculated. Confirmatory factor analysis was then used to examine each of the constructs developed in the questionnaires used.

Results And Discussion

The scope of this paper does not permit a complete discussion of all the results of this investigation. Therefore, consideration will be made of the major findings of this study - the development of the leadership, teacher outcomes and school learning environment constructs, and the results of fitting the variance components and multilevel models for teacher outcomes and some selected school learning environment factors.

The Development of Leadership, Teacher Outcomes and School Learning Environment Constructs

Leadership

Confirmatory factor analysis of the data gathered from the MLQ-5X (Short) instrument provided support for three leadership constructs. This was a disappointing result, as the MLQ-5X (Short) claims to be based on ten constructs: five transformational constructs (idealised influence - attributes; idealised influence - behaviours; inspirational motivation; intellectual stimulation; individualised consideration), three transactional leadership constructs (contingent reward; management by exception - active; management by exception - passive), and one non leadership factor (laissez-faire) (Bass and Avolio, 1997, p. 34). However, the data did support one transformational construct, "vision"; one hybrid transformational / transactional construct, "individualised consideration"; and one non leadership construct, "laissez-faire".

The construct "vision" consisted of items that emphasised the leader's concern in setting in place a desirable future state for their school. Key item phrases included values and beliefs, optimistic about the future, enthusiasms about what needs to be accomplished, having a strong sense of purpose and articulating a compelling vision for the future. The Cronbach alpha for this construct was $\alpha = .7991$.

The construct "individualised consideration" consisted of items that demonstrate the leader's concern in dealing individually with each follower. Items included treats me as an individual, considers me as having different needs, abilities and aspirations from others and provides me with assistance in exchange for my efforts. The Cronbach alpha for this construct was $\alpha = .8228$.

Lastly, the construct "laissez-faire" consisted of items that demonstrated the leader's non-interest in their leadership function. Items included in this factor highlighted the leader's avoidance of decision making, for example, is absent when needed, avoids making decisions and avoids getting involved when important issues arise. The Cronbach alpha for this construct was $\alpha = .8280$.

Factor correlations between each of the three leadership variables are shown below in Table 1.

Table 1 : Correlation Matrix of the Three-Factor Leadership Model

	VI	IC	LF
Vision (VI)	1.00		
Individualised Consideration (IC)	0.69 <i>0.03</i>	1.00 .	
Laissez-Faire (LF)	-0.55 <i>0.04</i>	-0.63 <i>0.04</i>	1.00 .

(significance levels shown in italics)

a. Teacher Outcomes

Four teacher outcome constructs were developed that examined differing aspects of teacher perceptions of their role and function in their schools. They included teacher perceptions of overall satisfaction with their leader (Cronbach alpha $\alpha = .8960$); perceptions of influence (Cronbach alpha $\alpha = .7254$); perceptions of teacher effectiveness (Cronbach alpha $\alpha = .6405$) and perceptions of focus of control (Cronbach alpha $\alpha = .5938$).

Factor correlations between the four teacher outcome variables are given below in Table 2.

Table 2 Four factor teacher outcome correlations

	SAT	INFLU	TEFF	TCON
Global satisfaction with leadership (SAT)	1.00			
Perceptions of influence (INFLU)	.23 <i>.06</i>	1.00 .		
Perceptions of effectiveness (TEFF)	.47 <i>.05</i>	.13 <i>.07</i>	1.00	
Perceptions of control (TCON)	.31 <i>.06</i>	.19 <i>.08</i>	.85 <i>.05</i>	1.00 .

(significance levels shown in italics)

b. School Learning Environment

Confirmatory factor analysis techniques were applied to the data gathered using the SLEQ (Fraser, 1986), which was designed to measure eight constructs of school learning environment. Confirmatory factor analysis found support for seven of the original eight variables, which included student supportiveness, affiliation, professional interest, centralisation, innovation, resource adequacy and achievement orientation. An analysis of the data could not support the inclusion of the eighth factor, formalisation, in this study.

The first variable, student supportiveness, referred to teacher's perceptions regarding the amount of support students received in their respective schools. Items included "most students are pleasant and friendly to teachers" and "students get along well with teachers". The Cronbach alpha for this construct was $\alpha = .7873$.

The construct, affiliation referred to teacher's perceptions of collegiality among the staff they worked with, and included items such as "I feel accepted by other teachers" and "I feel I could rely on my colleagues for assistance if I should need it". The Cronbach alpha for affiliation was $\alpha = .7266$.

The third construct, professional interest, measured teacher perceptions of the degree to which they talked about matters relating to their teaching positions in their respective schools. Items included "teachers frequently discuss teaching methods and strategies with each other", and "teachers show considerable interest in the professional activities of their colleagues". The Cronbach alpha for professional interest was $\alpha = .6667$.

The next construct, centralisation, referred to teacher's perceptions of the decision making processes within their schools, and their part in it. Items included "teachers are frequently asked to participate in decision concerning administrative policies and procedures", and "I have very little say in the running of the school". The Cronbach alpha for this construct was $\alpha = .7100$.

The fifth construct, resource adequacy, measured teacher perceptions of the availability of teaching resources for them to adequately perform their teaching function. Items emphasised the availability of videos, tape recorders and photocopying facilities. The Cronbach alpha for this construct was $\alpha = .7143$.

The construct innovation measured the degree to which teachers perceived they could implement new ideas in their teaching function. Key item phrases included that teachers were encouraged to be innovative, and that experimentation was encouraged in the school. The Cronbach alpha for this construct was $\alpha = .6107$.

The last construct measured was achievement orientation, or teacher's perception of pressure to be engaged in their work. Items included that "teachers have to work long hours" and "It is hard to keep up with your work load". The Cronbach alpha for this construct was $\alpha = .6862$.

Congeneric models were fitted to each of the constructs used in this study. An analysis of fit statistics indicated that each was at appropriate levels (Rowe, 2000; Goldstein, 1995). Finally, a correlation matrix (shown in Table 3) was calculated for each of these factors, with the majority of correlations being at levels of .450 and under.

Table 3: Seven factor school learning environment model correlations

	Student Supportiveness (SS)	Affiliation (AFF)	Professional Interest (PI)	Centralisation (CEN)	Innovation (INN)	Resource Adequacy (RA)	Achievement Orientation (AO)
Student Supportiveness (SS)	1.00						
Affiliation (AFF)	0.44 <i>0.05</i>	1.00					
Professional Interest (PI)	0.20 <i>0.06</i>	0.60 <i>0.05</i>	1.00				
Centralisation (CEN)	0.27 <i>0.05</i>	0.48 <i>0.05</i>	0.49 <i>0.05</i>	1.00			
Innovation (INN)	0.22 <i>0.06</i>	0.47 <i>0.05</i>	0.77 <i>0.04</i>	0.81 <i>0.04</i>	1.00		
Resource Adequacy (RA)	0.42 <i>0.05</i>	0.44 <i>0.05</i>	0.27 <i>0.06</i>	0.41 <i>0.05</i>	0.41 <i>0.06</i>	1.00	
Achievement Orientation (AO)	0.02 <i>0.06</i>	0.01 <i>0.06</i>	-0.01 <i>0.06</i>	-0.08 <i>0.06</i>	-0.03 <i>0.06</i>	-0.07 <i>0.06</i>	1.00

(significance levels shown in italics)

Multilevel Modelling

Introduction

Multilevel modelling provides a useful analytical tool to examine relationship between the explanatory variables (vision, individualised consideration and laissez-faire leadership) and the school learning environment response variables (student supportiveness, affiliation, professional interest, centralisation, innovation, resource adequacy and achievement orientation) and selected teacher outcomes (global satisfaction with leadership, perceptions of influence and effectiveness, and teacher control).

While multilevel modelling does not infer causality between the variables examined, it is particularly suited to this application, as the data has a nested data structure. This allows relationships to be examined both at a teacher level and a school level.

b. Variance Component Models

Initially, a two level variance component model was fitted to the data in order to determine the proportion of variance in both the response and explanatory variables. The results are shown in Table 4. Fixed residual estimate values (school intercepts) are close to zero, reflecting that they have been standardised and then normalised. Standardisation transforms all values regardless of their distributions and original unit of measurement to a distribution with a mean of zero and a standard deviation of 1, which in turn allows comparison across variables. Normalisation further adjusts standardised scores so that cross comparisons between variables can be made using a common metric. The ratio of parameter estimates to their associated standard errors have yielded significant t-values (> 1.96 , critical t-value), and

indicate that at the school level (σ_u^2) residual variance is statistically significant at the $p < 0.05$ level for the three leadership response variables, global teacher satisfaction with leadership and teacher perceptions of effectiveness, and the school learning environment variables of student supportiveness and innovation. At the teacher level (σ_e^2), all response variables are indicated as being statistically significant at the $p < 0.05$ level.

Table 4 also indicates that 20.8% of the variation in the leadership factor vision is due to differences between schools, and while 79.2% is due to differences within teachers. Further, this variation is statistically significant at both levels to the $p < 0.05$ level. Between school differences in individualised consideration (19.7%) and laissez faire leadership (25.1%) were also found, while within teacher differences accounted for 80.3% (individualised consideration) and 74.9% (laissez faire leadership) respectively. Clearly, most of the variation between the three leadership factors under consideration is at the teacher level, which is not an unreasonable finding. This simply reflects that each school has its own principal in a position of leadership, who brings a unique leadership style to their position.

A further finding is that most of the variation in leadership (vision, 79.2%; individualised consideration 80.3% and laissez faire 74.9%) can be found at the teacher level. This suggests that leaders form relationships with individual followers rather than with followers as a total group (Barnett, McCormick and Connors, 2000).

As with the variation in leadership factors, the majority of the variation in the school learning environment occurred at the teacher level (σ_e^2), which were statistically significant to the $p < 0.05$ level. Variation at this level was found to be high - student supportiveness (73.2%), affiliation (98.5%), professional interest (95.1%), achievement orientation (93.4%), centralisation (93.7%), innovation (83.5%) and resource adequacy (94.9%). At the school level (σ_u^2), only two variables, student supportiveness (26.8%) and innovation (16.5%) were found to be statistically significant at the $p < 0.05$ level. This results indicates that while some variation in school learning environment occurs at the between school levels, they are confounded by the variation that occurs at the teacher level.

Statistically significant variations within teachers were also found for the teacher outcome variables examined in this study. For the variable global satisfaction with leadership, 77.1% of the variation was accounted for at the within teacher level, while perceptions of teacher influence (96.5%), perception of teacher effectiveness (76.8%) and perceptions of teacher control (95.1%) all accounted for statistically significant, high variations. Only global satisfaction with leadership (22.9%) and perceptions of teacher effectiveness (23.2%) were found to be significant at the between school level.

Table 4: Base variance components for leadership, teacher outcomes and school learning environment variables showing proportions of between-schools and within-teachers residual variance. Parameter estimates and standard errors in parentheses.

Response Variables	Fixed		Random (Residual Variance)				Total T ²	Dev. Statistic -2* log (lh)
	Sch Intercept		Between-schools		Within teachers			
	%00 (s.e)		σ_u^2 (s.e)	%	σ_e^2 (s.e)	%		
LF ^A	-0.27(.081)		.242(.065)*	25.1	.721(.050)*	74.9	.963	1218.309
IC ^A	.000(.075)		.193(.057)*	19.7	.787(.055)*	80.3	.980	1247.486
VI ^A	.036(.076)		.198(.057)*	20.8	.752(.053)*	79.2	.950	1228.995
SS ^B	-.005(.081)		.252(.067)*	26.8	.689(.048)*	73.2	.941	1200.875
AFF ^B	-.011(.048)		.014(.023)	1.5	.924(.064)*	98.5	.938	1270.179
PI ^B	-.003(.055)		.048(.030)	4.9	.921(.054)*	95.1	.969	1281.432
AO ^B	-.009(.057)		.062(.057)	6.6	.883(.062)*	93.4	.945	1267.101
CEN ^B	.001(.058)		.062(.033)	6.3	.925(.065)*	93.7	.987	1287.616
INN ^B	-.014(.072)		.161(.051)*	16.5	.811(.057)*	83.5	.972	1254.508
RA ^B	-.012(.055)		.048(.030)	5.1	.886(.062)*	94.9	.933	1264.190
SAT ^C	-.014(.079)		.227(.064)*	22.9	.763(.053)*	77.1	.990	1239.846
INFLU ^C	-.018(.052)		.033(.027)	3.5	.902(.063)*	96.5	.936	1266.677
TEFF ^C	-.026(.079)		.223(.062)*	23.2	.736(.052)*	76.8	.959	1224.255
TCON ^C	-.007(.055)		.047(.030)	4.9	.922(.064)*	95.1	.969	1281.406

* Note statistically significant at the p < 0.05 level by univariate two tailed test.

A - Leadership; LF = Laissez Faire Leadership; IC = Individualised Consideration; VI = Vision. B - School Learning Environment; SS = Student Supportiveness; AFF = Affiliation; PI = Professional Interest; AO = Achievement Orientation; CEN = Centralisation; INN = Innovation; RA = Resource Adequacy. C - Teacher Outcomes; SAT - Global satisfaction with leadership; INFLU = Perceptions of Teacher Influence; TEFF = Perceptions of Teacher Effectiveness; TCON = Perceptions of Teacher Control.

c. Multilevel regression models

In total, eleven multilevel regression models were fitted to each of the four teacher outcome constructs and seven school learning environment constructs. Present space constraints allow only the reporting of two of those models - namely, teacher perceptions of global satisfaction with leadership, and the school learning environment construct of affiliation.

Teacher perceptions of global satisfaction with leadership

Table 5 below shows the results of fitting multilevel regression models to teacher perception of global satisfaction with leadership. The effect of the leadership variables on global satisfaction with leadership are shown in Multilevel Model Four, and indicate that the three explanatory variables, vision, individualised consideration and laissez-faire together with the demographic variables accounted for 36.4% of the total variation in this outcome, with all of the variation (100%) being recorded at the teacher level (σ_e^2). The final multilevel model indicates only those explanatory factors that have a statistically significant influence (to the $p < 0.05$ level) on teacher perceptions of satisfaction with leadership. They are, at the teacher level, the demographic variables tpos and tcur (teacher position in the school, and the amount of time served by the teacher in their current school), and at the school level, the leadership variables of individualised consideration and laissez faire leadership. Together, these explanatory variables accounted for 35.5 % of the variance recorded for this factor, all of which was recorded at the teacher level.

The fixed part of this model indicates that the two leadership explanatory variables, individualised consideration and laissez-faire, have a significant impact on teachers perception of satisfaction with leadership. Of particular note is the high proportion of variance account for by individualised consideration. It is evident that teachers perceptions of satisfaction with leadership is more likely to be manifested as the leader shows individualised care and concern for their staff.

Further, as expected, laissez-faire type leadership behaviours act to have a negative influence on teacher perceptions of satisfaction with leadership. A leader who delays decision making, or alternatively displays a "hands off" attitude to leadership is likely to encourage a negative impact of teacher perceptions of satisfaction with leadership

Table 5: Variation in 458 teachers' Global Satisfaction with Leadership scores in 52 schools, showing IGLS solutions: fitted estimates with standard errors in parentheses.

Explanatory Variables	Multilevel Model 1	Multilevel Model 2	Multilevel Model 3	Multilevel Model 4	Multilevel Model 5	Final Model
Fixed:						
Constant						
($\beta_0; X_0$):	-.014(.079)	-.018(.075)	-.022(.071)	-.002(.037)	-.002(.037)	-.002(.037)
<i>School Level Demographic</i>						
X_1 Tpos (β_1)		-.100(.076)	-.048(.073)	-.028(.042)	-.013(.048)	
X_2 Texp (β_2)		-.001(.116)	.084(.115)	.017(.075)	-.094(.095)	
X_3 Ssiz (β_3)		-.098(.074)	.048(.133)	.147(.117)	.158(.117)	
X_4 Tage (β_4)		-.101(.113)	-.114(.110)	.016(.070)	.093(.080)	
X_5 Tgen (β_5)		.086(.076)	.053(.073)	-.007(.043)	-.068(.055)	
X_6 Pgen (β_6)		.035(.077)	.111(.233)	.075(.218)	.040(.219)	
<i>Teacher Level Demographic</i>						
X_7 Tpos (β_7)			-.211(.043)*	-.197(.040)*	-.201(.040)*	-.185(.038)*
X_8 Texp (β_8)			-.057(.070)	-.077(.068)	-.075(.067)	
X_9 Tcur (β_9)			-.183(.053)*	-.171(.048)*	-.167(.048)*	-.197(.038)*
X_{10} Ssiz (β_{10})			-.156(.119)	-.166(.115)	-.163(.115)	
X_{11} Tage (β_{11})			.020(.065)	.024(.062)	.022(.062)	
X_{12} Tgen (β_{12})			.024(.043)	.021(.041)	.022(.041)	
X_{13} Pgen (β_{13})			-.099(.225)	-.103(.217)	-.102(.216)	
X_{14} TSCP (β_{14})			-.066(.054)	.009(.043)	-.012(.046)	
<i>School Level Leadership</i>						
X_{15} VI (β_{15})				.052(.068)	.033(.075)	
X_{16} IC (β_{16})				.310(.072)*	.262(.080)*	.361(.049)*
X_{17} LF (β_{17})				-.169(.056)*	-.208(.055)*	-.159(.049)*
<i>School Level School Learning Environment</i>						
X_{18} SS (β_{18})					.055(.055)	
X_{19} AFF (β_{19})					-.008(.053)	
X_{20} PI (β_{20})					.155(.064)*	
X_{21} CEN (β_{21})					.020(.068)	
X_{22} INN (β_{22})					-.072(.076)	
X_{23} RA (β_{23})					-.033(.054)	
X_{24} AO (β_{24})					.010(.056)	
Random:						
σ^2_{0u} (School-level)	.227(.064)*	.189(.056)*	.169(.050)*	.000(.000)	.000(.000)	.000(.000)
(%)	22.9%	19.9%	20.1%	0	0	0
σ^2_e (Teacher-level)	.763(.053)*	.761(.053)*	.673(.047)*	.630(.042)*	.621(.041)*	.639(.042)*
(%)	77.1%	80.1%	79.9%	100%	100%	100%
% of Variance Explained		4.0%	14.9%	36.4%	37.3	35.5%
-2 (Log-Likelihood)	1239.846	1232.416	1176.996	1088.243	1081.743	1094.752

*Statistically significant beyond the $p < 0.05$ level by univariate two tailed test i.e. the parameter estimate is greater than twice its standard error.

2. *Affiliation*

Table 6 below shows the results of fitting multilevel regression models to the school learning environment variable affiliation. Affiliation is the perception among teachers as to the degree of collegiality they share on their respective staffs.

The power of multilevel analysis lies in the fact that the influence of explanatory variables can be considered on multiple levels. Further, the constructs of school learning environment and leadership are group perception constructs and lend themselves to analysis from a group level perspective. To facilitate this individual teacher responses were aggregated to obtain group level means, which were used in the analysis. The analysis could also consider the variation in teacher level scores of group level variables.

Table 6 indicates that the three leadership explanatory variables, vision (VI), individualised consideration (IC) and laissez faire leadership (LF), along with the other demographic variables, accounted for 5.5% of the total variation in teachers perceptions of affiliation, with all of this variation being accounted for at the teacher level (Multilevel Model 4). While the addition of the leadership variables was demonstrated as being statistically significant (as shown by the difference between the log-likelihood scores of 1256.123 and 1244.256), only laissez faire leadership was initially shown to be significant to the $p > 0.05$ level. The Final Model (Table 6) indicates that the leadership variables individualised consideration (IC) and laissez faire leadership (LF) both had statistically significant positive effects on teacher perception of affiliation.

The reasons for this effect may be several. The individualised consideration (IC) behaviours that the principal models to staff may well be repeated in staff interactions with each other, thus promoting a greater sense of collegiality. If staff feel individually known and cared for by their principal, they may well show the same concern towards other staff members. Further, the laissez faire leadership behaviours of principals, including avoiding decision making and being absent when needed, can have the effect of encouraging staff to look to collegial work groups as a substitute for leadership (Dionne, Yammarino, Atwater and James, 2002, p. 455).

Table 6: Variation in 458 teachers' Affiliation scores in 52 schools, showing IGLS solutions: fitted estimates with standard errors in parentheses

Explanatory Variables	Multilevel Model 1	Multilevel Model 2	Multilevel Model 3	Multilevel Model 4	Multilevel Model 5	Final Model
Fixed:						
Constant						
($\beta_{0j}X_0$):	-.011(.048)	-.012(.045)	-.012(.045)	-.012(.044)	-.012(.043)	-.012(.044)
School Level						
Demographics						
X_1 <i>Tpos</i> (β_1)		.031(.048)	.034(.049)	.060(.050)	.036(.056)	
X_2 <i>Texp</i> (β_2)		.024(.081)	.006(.089)	-.003(.089)	-.056(.112)	
X_3 <i>Ssiz</i> (β_3)		-.068(.047)	-.186(.139)	-.150(.139)	-.157(.138)	
X_4 <i>Tage</i> (β_4)		.024(.077)	.056(.084)	.064(.083)	.102(.093)	
X_5 <i>Tgen</i> (β_5)		.087(.047)	.089(.050)	.092(.052)	.050(.064)	
X_6 <i>Pgen</i> (β_6)		.050(.047)	-.218(.261)	-.172(.259)	-.161(.258)	
Teacher Level						
Demographics						
X_7 <i>Tpos</i> (β_7)			-.065(.048)	-.058(.048)	-.065(.047)	
X_8 <i>Texp</i> (β_8)			-.027(.081)	-.032(.080)	-.028(.080)	
X_9 <i>Tcur</i> (β_9)			.068(.058)	.068(.057)	.075(.057)	
X_{10} <i>Ssiz</i> (β_{10})			.129(.139)	.125(.137)	.131(.135)	
X_{11} <i>Tage</i> (β_{11})			.054(.075)	-.052(.074)	-.055(.073)	
X_{12} <i>Tgen</i> (β_{12})			.019(.050)	.018(.049)	.019(.048)	
X_{13} <i>Pgen</i> (β_{13})			.176(.261)	.175(.258)	.176(.255)	
X_{14} <i>TSCP</i> (β_{14})			.028(.050)	.053(.051)	.020(.054)	
School Level						
Leadership						
X_{15} <i>VI</i> (β_{15})				.084(.080)	.115(.086)	
X_{16} <i>IC</i> (β_{16})				.152(.085)	.138(.091)	.182(.061)*
X_{17} <i>LF</i> (β_{17})				.202(.067)*	.247(.087)*	.209(.048)*
School Level						
School Learning Environment						
X_{18} <i>SS</i> (β_{18})					.001(.065)	
X_{19} <i>AFF</i> (β_{19})					na	na
X_{20} <i>PI</i> (β_{20})					.121(.073)	.124(.048)*
X_{21} <i>CEN</i> (β_{21})					-.031(.080)	
X_{22} <i>INN</i> (β_{22})					-.014(.090)	
X_{23} <i>RA</i> (β_{23})					.114(.062)	.102(.046)*
X_{24} <i>AO</i> (β_{24})					-.020(.067)	
Random:						
σ^2_{0u} (School-level)	.014(.023)	.000(.000)	.000(.000)	.000(.000)	.000(.000)	.000(.000)
(%)	1.5%	0	0	0	0	0
σ^2_e (Teacher-level)	.924(.064)*	.920(.061)*	.909(.060)*	.886(.059)*	.866(.057)*	.887(.059)*
(%)	98.5%	100%	100%	100%	100%	100%
% of Variance Explained		1.9%	3.1%	5.5%	7.7%	5.4%
-2 (Log-Likelihood)	1270.179	1261.677	1256.123	1244.256	1233.719	1244.670

* Statistically significant beyond the $p < 0.05$ level by univariate two tailed test i.e. the parameter estimate is greater than twice its standard error.

Summary and Conclusions

This study reports some preliminary findings of an investigation into the impact of transformational and transactional leadership styles of secondary school principals on teacher perceptions of selected school learning environment and teacher outcome variables. Several issues are raised as far as the relationship between these variables is concerned.

Firstly, most of the variation found in the data was at within teacher level rather than at the between school level. This is indicative of the relationship that exists between the principal as leader and the teacher as a follower, rather than between the principal and a group of followers. It is not surprising, therefore, that the hybrid transformational / transactional factor individualised consideration has a greater impact on teacher perceptions of overall satisfaction with leadership than did the transformational factor of vision. Individual teachers seem to be motivated more by the care and individualised concern shown to them by their leader rather than by having their aspirations motivated and elevated by a vision. This is a controversial finding and contrary to the literature in that proponents of transformational leadership claim that this is the way to obtain performance from their staff beyond that which would normally be expected (Bass, 1985).

This preliminary analysis also demonstrated that principals as leaders in schools are able to manipulate their leadership behaviours and so produce a differential effect on aspects of a school's learning environment. As highlighted earlier, the hybrid transformational / transactional leadership behaviour of individualised consideration had a greater impact on affiliation than did vision. This may well reflect the importance of modelled behaviour as far as promoting collegiality in school communities is concerned. Further, the importance of laissez faire leadership needs to be considered when principals wish to manipulate school learning environment variables.

Several other of the school learning environment variables show evidence of indirect effect through centralisation. This was certainly the case with student supportiveness, affiliation and innovation, and will be reported on in another forum.

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