

A Discriminant Analysis of Teacher Autonomy

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Autonomous teachers were compared to nonautonomous teachers on several work-related attitudes and perceptions and their reaction to conditions in their work environment to determine which variables best differentiate the two groups. The participants in the study consisted of a representative sample of public school teachers in a large urban school district in Florida. The data were gathered through a mailed survey titled Survey of Teacher Characteristics and Activities (STCA). The results of a stepwise discriminant function analysis suggest that autonomous teachers can be reliably distinguished from nonautonomous teachers by the pattern of work-related attitudes and perceptions and reactions to conditions in the work environment. Autonomous teachers were more apt to teach at the elementary level; were more satisfied with their jobs; perceived their paper-work load to be lighter; and had a more positive attitude towards parents, students, and administrators.

Attrition in the teaching profession has continued to be a major problem facing both large and small school districts throughout the nation (Duke, 1984; Mark & Anderson, 1985; Murphy, 1982; Rosenholtz & Smylie, 1984; Seyfarth & Bost, 1986). Evidence exists that teachers' uncertainty about their chosen profession registers almost immediately after they enter teaching. For example, in studies of first-year teachers, Villeme & Hall (1983-84) found that over 25% of new teachers expressed the intention to quit teaching or admitted that they were considering quitting. One of the main reasons that teachers contemplate quitting the profession is the lack of empowerment to make decisions (e.g., regarding class composition and size, scheduling, curriculum and text content, and planning and allocation of space). Most of these decisions are made by legislatures or by school boards and their administrators (Feir, 1985; Nyberg & Farber, 1986; Retsinas, 1982). As a result of these conditions, many teachers are interested in securing the right to manage themselves and their job environment. This right is necessary if young professionals who respect themselves and their work are to be attracted to and kept within the teaching profession (Grant et al., 1983; Hall, Villeme, & Phillippy, 1989; Heid & Leak, 1991; Kremer & Hofman, 1981; Sacks, 1984).

Several motives (Kremer & Hofman, 1981) account for teachers leaving the profession. The most frequently mentioned include (a) burnout, (b) lack of encouragement, (c) low professional status, (d) lack of promotional opportunity, and (e) lack of teaching autonomy. These suggest that teacher turnover might be decreased if administrators were more sensitive to the teachers' needs for more

personal autonomy, greater job satisfaction, and higher professional identity. Hall, et al. (1989) have shown that the degree of autonomy perceived by new teachers is indicative of current job satisfaction and a positive reaction to teaching. Those new teachers who expressed the greatest satisfaction had higher autonomy scores, and those teachers who had higher autonomy scores expressed willingness to enter teaching again if faced with that decision.

In a study that examined the long-range plans of experienced teachers, those teachers who planned to quit the profession expressed less satisfaction with their current employment and their current salary, and had a more negative attitude toward both teaching as a career and the school administration. These teachers also described themselves as having less autonomy and were more apt to perceive limited opportunity for advancement in teaching as an important explanation of why teachers leave their jobs (Hall, Pearson, & Carroll, 1993). Perception of autonomy has also been found to be related to factors within the work environment and teacher attitudes; and not traditional variables such as academic ability, years of teaching experience, gender, age, and quality of prior training (Pearson & Hall, 1993). Teacher autonomy seems to be an important attribute that needs further examination in the exploration of school reform and teacher retention, especially since lack of autonomy has been cited as a critical reason why teachers leave the profession. Perhaps identifying those factors that relate most strongly to autonomy will provide more focus for the study of this important attribute, and insight into reducing attrition from the profession.

Purpose

The purpose of this study was to investigate teacher autonomy. Autonomous individuals were compared to nonautonomous individuals on several variables to determine those that best differentiate the two groups. The two groups of teachers were compared in terms of their work-related attitudes and perceptions and their reaction to conditions in their work environment. The variables that were examined were implicated in earlier investigations of professional persistence (Chapman & Hutcheson, 1982; Hall & Carroll, 1987; Hall et al., 1993; Kremer & Hoffman, 1981; Seyfarth & Bost, 1986), autonomy (Pearson & Hall, 1993), and job satisfaction (Rinehart & Short, 1993). The intent was to identify the linear combination of the attitudinal and work-related variables that maximized discrimination between the two groups.

Method

Subjects

The participants in the study consisted of a representative sample of public school teachers in a large urban school district in Florida. The district's population of about 6400 teachers (K-12) was stratified by school and a 12% proportional random sample ($N = 770$) was drawn from each school. The response rate was 54% ($N = 416$ cases). Of the 416 cases, four were deleted from the analysis because they were outliers, many of the cases had a missing group code or at least one discriminating variable, and a large number of the cases were excluded for cross validation. Approximately 60% of the cases ($N = 193$) were randomly selected to compute the discriminant function (program used was SPSSx), and the remaining approximate 40% ($N = 117$) of the cases were used for cross-validation. Of the 193 cases used for the analysis, 87 were autonomous versus 106 who were not autonomous. The two groups were determined by blocking on the autonomy score, i.e. those teachers who were +1 standard deviation and above were considered autonomous and those teachers who were -1 standard deviation and below were considered nonautonomous.

Procedure

The data were gathered through a mailed survey titled Survey of Teacher Characteristics and Activities (STCA). The STCA was placed in the school boxes of the teachers selected for the study, along with a cover letter explaining the survey, and the completed survey was mailed directly back to the university via an enclosed stamped envelope. All responses were anonymous. A follow-up reminder was sent two weeks after the initial request. Complete data were received from 416 teachers for a return rate of 54%. Of the 416 respondents, 186 taught elementary school, 97 taught middle school, and 110 taught high school. The remaining 29 held other types of teaching positions.

Instrumentation

The initial section of the STCA sought to determine teachers' descriptive attributes and their current employment conditions (e.g., age, gender, teaching level, subject matter emphasis). Another section of the STCA inquired into conditions in the teachers' work environment, including satisfaction with current employment, current salary, perceived paper work load, instructional load, and stress level. A third section recorded the teachers' perceptions of their classroom autonomy. A fourth section asked the teachers for their attitudes toward teaching as a career (6 items), toward students (6 items), and toward the school administration (5 items). A two-item efficacy measure adopted from Berman and McLaughlin (1977) was used to measure the teachers' beliefs about their influence with students. Cronbach alpha reliabilities for the various measures ranged from .76 to .92.

Statistical Analysis

Prior research (Chapman & Hutcheson, 1982; Hall & Carroll, 1987; Hall et al., 1993; Kremer & Hoffman, 1981; Pearson & Hall, 1993; Rinehart & Short, 1993; Seyfarth & Bost, 1986) was used to identify 11 variables that had potential for use in a stepwise discriminant function analysis. The variables included those that were demographic (teaching level), attitudinal (teacher efficacy, parents, teaching, administration, students), and work-related (job stress, salary, perceived paperwork load, instructional load, job satisfaction). Teaching level was the only demographic variable that yielded any prior relationship to autonomy (Pearson & Hall, 1993). Prior to data analysis, all statistical assumptions were examined to insure that the solution was as accurate as possible. All of the variables were eligible to enter the equation, and the retention of variables in the analysis was determined by Wilk's lambda. The 11 predictor variables were used to discriminate between those teachers who were autonomous versus those teachers who were not autonomous.

Results

The statistical assumptions that are associated with discriminant function (e.g., sample size, linearity, univariate and multivariate outliers, multivariate normality, homogeneity of variance-covariance matrices, and multicollinearity and singularity) were examined and met.

Descriptive Statistics

Group means and standard deviations for the 11 predictor variables are provided in Tables 1 and 2. On examination of the group means, the variables seemed to have the ability to discriminate between the two groups of teachers. On teaching level, those teachers who were more autonomous tended to be secondary teachers, were more satisfied with their work, perceived a lighter instructional load, a lighter paper work load, less on-the-job stress, and were more satisfied with their salary. On the attitudinal variables, the more autonomous teachers had a more positive

Table 1
Means and Standard Deviations on the Demographic and Work-Related Variables

	Autonomous (N = 87)		NonAutonomous (N = 106)	
	M	SD	M	SD
Level	1.65 ^a	.47	1.50	.50
Satisfaction	1.65 ^b	.77	2.22	.97
Load	2.32	.79	1.96	.89
Paper	1.96	.89	1.53	.77
Stress	2.12	.99	1.66	.67
Salary	3.39 ^b	1.11	3.45	1.11

^a High mean reflects secondary teaching

^b Low mean reflects more job satisfaction, more satisfaction with salary

attitude toward the administration, students, parents, and felt that they had more influence with students.

Stepwise Discriminant Analysis

Univariate *F* ratios and Wilk's lambda for each of the 11 predictor variables are shown in Table 3. Univariate *F*s represent a test of the equality of means for the two groups for each variable. Based on the *F* ratio, all of the variables showed statistically significant differences in means between those teachers who were autonomous versus those teachers who were not autonomous except for two (parental attitude and salary).

The results of the stepwise discriminant analysis with all variables considered for analysis are presented in Table 4. On the basis of Wilk's lambda, however, parental attitude, which was not originally eligible, entered into the equation. The six variables that discriminated between the

two groups were job satisfaction and perceived paperwork load (work-related), teaching level (descriptive), and attitude towards students, parents, and administration (attitudinal). Since there were only two groups, only one discriminant function was calculated and its significance was determined using the χ^2 test ($\chi^2 = 51.0$, $df = 6$, $p = .0001$). The square of the canonical correlation coefficient (.49) indicated that about 24% of the variance was shared by the linear combination of the variables.

The standardized canonical discriminant function coefficients support the importance of the student attitude and perceived paper work load variables. The standardized coefficients for the full model indicate that these two variables were highest after adjusting for all other variables in the analysis. The loading matrix of correlations (structure coefficients) between the six predictor variables and the

Table 2
Means and Standard Deviations on the Attitudinal Variables

	Autonomous (N = 87)		NonAutonomous (N = 106)	
	M	SD	M	SD
Admin	17.55	4.64	15.30	4.49
Teach	27.77	4.97	25.10	5.64
Student	24.36	5.58	21.33	5.58
Parent	19.12	5.47	17.66	5.50
Efficacy	6.98	1.80	6.02	2.01

Table 3
Univariate F Ratios and Wilk's Lambda for Predictor Variables

Variable	Wilk's lambda	F Ratio (df = 1,191)	Sig.
Level	.98	4.20	.04
Job Satisfaction	.91	19.56	.01
Instructional Load	.93	14.68	.01
Paperwork Load	.94	12.73	.01
Job Stress	.93	14.86	.01
Salary	.99	.15	.70
Administration	.94	11.62	.01
Teaching	.94	11.64	.01
Students	.93	14.04	.01
Parents	.98	3.37	.07
Efficacy	.94	11.89	.01

discriminant function suggests that the two highest variables in distinguishing between autonomous teachers and nonautonomous teachers were teaching level and perceived paperwork load.

Cross Validation

To determine how well the classification coefficients functioned, a cross validation was performed (Table 5). Approximately sixty percent of the cases were randomly selected initially to calculate the discriminant function, and the remaining approximate 40% of the cases were held as a new sample for cross-validation. The new sample was kept from the initial analysis to avoid classification bias (i.e., using the same cases for analysis and classification) and the need for correction due to shrinkage. Results of the cross validation indicated that 33 (76.6%) of the nonautonomous teachers were correctly classified into that

group and 10 (23.3%) were misclassified into the autonomous group. Within the autonomous group, 36 (69.2%) cases were correctly classified into that group and 16 (30.8%) were incorrectly classified into the nonautonomous group. There were 22 ungrouped cases, 10 and 12 in each group, nonautonomous and autonomous, respectively. Overall, the percentage of correctly "grouped" cases was 72.6%.

Conclusions

The results suggest that autonomous teachers can be reliably distinguished from nonautonomous teachers by the linear combination of two work-related variables (job satisfaction and perceived paper work load), a demographic variable (teaching level), and three attitudinal variables (attitude towards students, parents, administration). Those

Table 4
Standardized Canonical Discriminant Function Coefficients and Structure Coefficients for the Six Predictor Variables

Predictor Variable	Standardized Coefficient	Structure Coefficient
Level	.43	.88
Job Satisfaction	-.41	-.46
Paperwork Load	.55	.66
Administration	.29	.06
Student	.74	.13
Parent	-.39	-.07

Table 5
Results of Classification of Cross-Validation Sample

Case	Predicted	
	Nonautonomous	Autonomous
Nonautonomous (<i>N</i> = 43)		
No.	33	10
%	76.7	23.3
Autonomous (<i>N</i> = 52)		
No.	16	36
%	30.8	69.2

Note. The percentage of "grouped" cases correctly classified was 72.6%.

teachers who indicated autonomy had higher job satisfaction and perceived a lighter paperwork load. They also tended to be secondary teachers and had more favorable attitudes toward students, their parents, and the administration. Autonomous teachers, however, were not distinct from nonautonomous teachers on such work-related factors as perceived instructional load, job stress, and salary; nor on attitudinal factors such as teaching as a career and efficacy.

These findings are consistent with the findings of prior researchers (Hall, VILLEME, & PHILLIPPY, 1989; RINEHART & SHORT, 1993) in that the degree of autonomy perceived does have a bearing on job satisfaction. Both studies indicated that the autonomous teachers were more satisfied with their jobs, and were also willing to enter teaching again (Hall, VILLEME, & PHILLIPPY, 1989). It has also been demonstrated that for those who do leave the profession, lack of autonomy was cited as a reason for leaving (KREMER & HOFFMAN, 1981). Recent research concerning job persistence (CHAPMAN & HUTCHESON, 1982; HALL & CARROLL, 1987; HALL et al., 1993; KREMER & HOFFMAN, 1981; SEYFARTH & BOST, 1986) had suggested that attitudes and work-related conditions may yield more meaningful relationships with autonomy than traditional variables such as academic ability, years of teaching experience, and quality of prior training (PEARSON & HALL, 1993). The findings of this study support these prior results in that the autonomous teachers were discriminated from nonautonomous teachers on several of these attitudinal and work-related variables. It is interesting, however, that several of the work-related variables such as job stress and perceived instructional load did not serve as good discriminators.

The results of this study support Chapman and Hutcheson (1982) and Hall, Villeme, and Phillippy (1989)

in highlighting the role that perceptual variables play in teacher retention. Although perceptions, per se, are not reality, the perceptions that teachers hold about their work environment can clearly be harbingers of job persistence. The inability of the multiple regression weights to classify correctly over 25% of the cross-validation sample suggests that other important variables that influence a teachers' perception of autonomy remain to be identified and examined. Future studies should be broadened to include other variables that may provide insight into autonomy. Perhaps other professionalization factors, such as committee involvement at the school and district level and professional memberships/activity, will provide additional areas of study. The more we understand about the attribute of autonomy and its relationship to other indicators of job persistence, the better equipped we will be in preparing teachers for a long and successful commitment to their chosen profession.

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