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ABSTRACT

This study examined a new measure of ecological dissonance (ED), whether different degrees of ED existed within levels of a university's power hierarchy, the relationship between ED and worker morale as a function of administrative power levels, and ED theory. Ninety-four faculty members at Mississippi State University completed the Index of Power Discrepancy, the Index of Worker Morale (Job Satisfaction Index, Work Alienation Scale, and Job Involvement Index), and a demographic data questionnaire. Three regression models predicted job satisfaction, work alienation, and job involvement. A repeated measures analysis of variance on four ED scores tested whether the mean of ED scores did not differ in the four influence systems in the organizational hierarchy. Respondents experiencing ED exhibit alienation, non-high involvement, and job dissatisfaction. Subjects reported a larger discrepancy between preferred and perceived power usage when examining the power use of the provost and college president than when examining that of the department head and dean. Correlations between ED and worker morale are similar for positions most distant from subordinates. The ED measure predicts worker morale best when dealing with superiors who have regular contact and immediate power over faculty members. Faculties perceive more ED in coercive and legitimate powers, but less ED in expert and reward powers when individually comparing the five preferred power styles with the five perceived superior power styles. Three tables are included. (RLC)

Measurement of Ecological Dissonance with Bases of Power

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MEASUREMENT OF ECOLOGICAL DISSONANCE WITH BASES OF POWER

Introduction

After Lewin, Lippitt, and White (1939) first successfully conceptualized and defined the effects of social climate on worker attitudes and performance, much research has been focused on this field. Generally, organizational climate can be defined as a set of characteristics of an organization that distinguish one organization from another. These characteristics are relatively enduring over time, and they influence the behavior of people in the organization (Forehand & Gilmer, 1964).

The organizational climate has also been defined by Campbell, Dunnette, Lawler, and Weick (1970) as a set of attributes specific to a particular organization that is induced from the method the organization uses to deal with its members and its environment. This climate takes the form of set attitudes and expectancies that describe the organization by static characteristics, behavior-outcome, and outcome-outcome contingencies. Organizational climate is considered a perceptual measure that describes the organization and that is different from attitudinal, valuative, and need-satisfaction variables.

McCelland and Burnham (1976) indicated that the process of acquisition and maintenance of power is one of the most obviously socially motivating processes in organizations. Person A will

have power over another if he or she can perform an act that will result in a change in person B. If a power relationship exists between two persons, the source of this power needs to be composed of at least two components: person A's resource of power and another person's motive base of power (i.e., his certain needs or values). For example, before person A can have power over another, person A must have certain resources to control or influence person B's needs or values.

French and Raven (1959) asserted that social influence happens when a social agent, O, produces an influence on a person, P; O could be either another person, a role, a norm, a group, or a part of a group. French and Raven distinguished five common bases of power:

> (a) reward power, based on the P's perception that O has the ability to mediate rewards for him; (b) coercive power, based on the P's perception that O has the ability to mediate punishments for him; (c) legitimate power, based on the perception by P that O has a legitimate right to prescribe behavior for him; (d) referent power, based on the P's identification with O; (e) expert power, based on the P's perception that O has some special knowledge or expertness. (p. 150)

In the past 20 years, most of the measurement research on bases of power stems from the work of French and Raven (1959). Those researchers ascertained that the five kinds of power have existed and have been widely applied in the organizational control system; they also have been commonly observed by members in the organization.

Price (1972) defined bases of influence as referring to the reasons for doing things suggested by a superior. Bachman (1968) used the five categories of French and Raven's (1959) bases of power as a measurement to examine the relationship between the satisfaction of faculties and the different levels of influence of the academic deans in 25 different colleges. He found the effective dean's influence was based upon a relatively high degree of competence and personal attractiveness and a relatively low dependence upon his legitimate power and coercive power. Expertise was considered the most prominent basis of the dean's influence. There also existed a positive relationship between satisfaction and the total amount of influence at all levels. Bachman concluded that when the academic dean enjoyed a relatively high degree of influence and when this influence was based upon expertise and personal attractiveness, the faculty's satisfaction with the academic dean was higher.

Sheridan and Vredenburgh (1978) used a regression model to explain the relationship of the head nurses' leadership behavior and French and Raven's (1959) bases of power variables. They examined the validity of leadership behavior and social power variables to predict the behavioral criteria of subordinates' job performance and their decisions to terminate employment as well as their perceived stress on the job. Sheridan and Vredenburgh found that leader consideration was inversely associated with tension, terminations, and job performance. They also reported

that task structure had a significant interactive effect with expert and coercive power in predicting terminations. More specifically, coercive power had a significantly positive correlation with job tension in the highly structured situations, and expert power had a significantly negative correlation with job tension in the unstructured situations.

Miller, Topping, and Wells-Parker (1989) developed Ecological Dissonance Theory, which is conceptually related to Festinger's (1957) Cognitive Dissonance Theory and Barker's (1968) Ecological Theory, to help explain the complexity of the interplay of systems that provides both the structure and the dynamics of organizational climate. Barker believed that different ecological environments produce and affect different behavior. He defined the ecological environment of humans as a set of homeostatically governed eco-behavioral entities consisting of non-human components and human components. The ecological environment might possess an important role in modifying these human and non-human components in predictable ways to maintain the environmental entities in their characteristic states. He indicated that the ecological environment varied systematically from inhabitant to inhabitant; also, if the inhabitant's own ecological properties changed, the programs of the whole environment would change sequentially. Miller et al. explained that cognitive dissonance exists when personal subsystems conflict, and ecological dissonance exists

when two or more environmental systems conflict or when one or more personal subsystems conflict with one or more environmental systems. Miller et al. indicated that ecological dissonance can be present when cognitive dissonance is not present or after cognitive dissonance has been resolved.

Miller et al. (1989) provided five propositions of ecological dissonance theory:

> (1) Ecological dissonance is a state of conflict which will result in the mobilization of forces directed at its attenuation. Conflicts exist when two or more systems are pushing the inhabitants toward goals which are incompatible with each other.
>
> (2) The energy expended in the removal of ecological dissonance is a function of the amount of dissonance existing within the ecological unit. Energy is defined as the number and intensity of the interactions among the inhabitants directed at the removal of the conflict.
>
> (3) The amount of ecological dissonance is a function of the proximity and power of the systems in conflict, with the greatest dissonance occurring between systems of equal power which are functionally close to each other.
>
> (4) Reduction of ecological dissonance: (a) Changing the systems in conflict will reduce ecological dissonance. Mechanisms used to bring about the change would include, but are not limited to, bargaining, mediation, arbitration, legal and organizational adjudication, and voluntary capitulation on the part of the weakest system; (b) Compartmentalization of the systems in conflict will also reduce ecological dissonance.
>
> (5) If ecological dissonance cannot be immediately reduced, the ecological system will continue pressuring the inhabitants until some degree of consonance is achieved or until the system disintegrates. Disintegration is unlikely, however, since overstressed inhabitants will probably leave the setting, being replaced by new inhabitants who would initially be able to cope with the pressure. (p. 164)

Miller et al. (1989) recommended using measures of equal opportunity in organizational environments as useful operational definitions for ecological dissonance. They also recommended using Bachman's "Base of Influence" (Price, 1972) to assess the

degree of ecological dissonance between the organizational control system and the individual preferences for certain types of control or influence. Their recommendations conceptualized the core of the present study.

There have been a series of studies conducted to measure equal opportunity as a specialized form of organizational climate (Burton, 1990; Fisher, 1988; Hooper, 1988; Majors, 1989). Fisher developed an equal opportunity climate assessment instrument. She found there was a significant correlation between equal opportunity climate and satisfaction, commitment, and other measures of organizational climate. Hooper also developed an equal opportunity climate measure; her measure assessed equal opportunity for females in an academic setting. Majors and Burton, in validating Hooper's measure, found that the measurement of equal opportunity climate predicted students' satisfaction and provided evidence in support of ecological dissonance theory.

There were three purposes for the present study. The first was to investigate a new measure of ecological dissonance. The measure was constructed by using the "bases of power measure" developed by Bachman (Price, 1972). Specifically, the differences between the rates assigned to the subject's perception of actual power usage and the rates assigned to the subject's preferred power usage were used as an operational definition of ecological dissonance. The measure of ecological

dissonance was correlated with a measure of job satisfaction, with a measure of alienation, and with a measure of involvement. It was hypothesized that those respondents who experience ecological dissonance as shown by the "bases of power measure" would exhibit a feeling of alienation, would not exhibit high involvement, and would also be dissatisfied with their jobs.

The second purpose of the study was to determine if different degrees of ecological dissonance existed within the levels of the power hierarchy. The means of ecological dissonance, which were examined at each influence system, were compared by using repeated measure: analysis of variance. Specifically, it was hypothesized that the subjects would report a larger discrepancy between preferred and perceived power usage when examining the power use of the provost and the college president than when examining the power use of the department head and the dean. That is, a positive linear relationship was expected between ecological dissonance and the variable of administrator authority: the higher the administrative level, the greater the ecological dissonance.

The third purpose was the examination of the strength of the relationship between ecological dissonance and worker morale as a function of the administrative power levels being examined. All four ecological dissonances were examined in three regression models to predict job satisfaction, work alienation, and job involvement, respectively. It was hypothesized that correlations

between ecological dissonance and worker morale would be smaller for the positions most distant from the subordinate; i.e., the provost and college president.

Methods

The subjects were 94 general faculty members in various academic departments at Mississippi State University, responding rate was 63 percent (94 out of 150). The names of the subjects were selected by using simple random sampling through the 1991 Mississippi State University campus telephone directory. In order to increase the response rate and keep absolute anonymity, no further background questions were asked. No incentive was offered to the subjects for participation.

Two instruments comprised the survey: the Index of Power Discrepancy and the Index of Worker Morale (including the Job Satisfaction Index, the Work Alienation Scale, and the Job Involvement Index). In addition, each subject received a simple demographic data questionnaire.

The Index of Power Discrepancy was developed by the author in an attempt to obtain a measure of ecological dissonance for the members of an organization. Questions were adopted from French and Raven's (1959) definition of bases of power and items from Bachman's (1968) study. The instructions for the questionnaires were given at the beginning of each page of the Index of Power Discrepancy. The subjects were instructed to rate

the five bases of power in terms of the power they would prefer their supervisors to use in leading their work group. They were also instructed to rate the same five reasons they do things their department head, dean, provost, and president of the university want them to do. After taking the difference from the subject's response to the preferred leadership styles versus the subject's response to the actual administrator's leadership styles for the same base of power, a difference number was generated in each of the bases of power. By taking the absolute value of every difference number and then summing the difference numbers of the five bases of power, an ecological dissonance number was generated in a single influence system. Ecological dissonance levels in all the four influence systems were generated by the same procedure.

The Index of Worker Morale contained 18 items from Brayfield and Rothe's (1951) Job Satisfaction Index, 5 items from Miller's (1967) Work Alienation Scale, and 6 items from Lodahl and Kejner's (1965) Index of Job Involvement. Job satisfaction was defined as the degree of peoples' feelings about different jobs, work alienation was defined as the degree of a person subjectively experiencing powerlessness to control his or her own work activities, and job involvement was defined as the degree of a person's work performance affecting his or her self-esteem. A scale ranging from strongly disagree (1) to strongly agree (4) was used to assess the responses given by subjects in those items

of the Alienation Scale, the Involvement Index, and the Job Satisfaction Index.

The subjects received the questionnaire combined with the Index of Power Discrepancy and the Index of Worker Morale. The order for subjects to indicate the preferred or perceived type of power use was: (1) response to power use of expectation, (2) response to power use of the department head, (3) response to power use of the dean, (4) response to power use of the provost, and (5) response to power use of the president of the university.

The subjects were instructed to respond to the survey by following the instructions provided for each part. Because the major purpose was to analyze the ecological dissonance based on four different influence systems, the repeated measures design provided a better control on subject differences; i.e., by adapting the repeated measures design, the variability due to difference between subjects could be eliminated from the experimental error. Therefore, the means of four different "Ecological Dissonance" numbers that subjects used to respond to the power usage of the department head, the dean, the provost, and the president of the university were also analyzed and compared by using a repeated measures analysis of variance in the SPSS.

Also, the "Ecological Dissonance" numbers were correlated with the scores from the Job Satisfaction Index, the Work Alienation Scale, and the Job Involvement Index using the Pearson

product-moment correlation coefficient and regression analyses.

Results and Discussion

Reliability

The reliability of the scales was computed by calculating product-moment correlation coefficients between halves of the scales, using order items as the split in SPSS. The split-half correlations were: 0.53 for preferred power scale, 0.57 for department head's actual power usage, 0.56 for dean's actual power usage, 0.44 for provost's actual power usage, and 0.73 for president's actual power usage.

Correlation analysis

Pearson product-moment correlation coefficients for each of the measures of ecological dissonance (generated from the influence systems of the department head, the dean, the provost, and the president of the university) were calculated among the Work Alienation Scale, the Job Involvement Index, and the Job Satisfaction Index. These analyses were performed to see if the ecological dissonance scores had any significant relationship with the Work Alienation Scale, the Job Involvement Index, and the Job Satisfaction Index.

There were significant positive correlations between the respondents' ecological dissonance scores (the department head's influence system) and the Work Alienation Scale (r = .43, p<.001). There were also significant negative correlations

between the Job Involvement Index (r = -.35, p<.001), the Job Satisfaction Index (r = -.37, p<.001), and the respondents' ecological dissonance scores (the department head's influence system). These correlations suggest that those respondents who perceived ecological dissonance in the department head's influence system were alienated from their work, not involved in their jobs, and appeared to be dissatisfied with their jobs.

There was a significant positive correlation between the respondents' ecological dissonance scores (the dean's influence system) and the Work Alienation Scale (r = .30, p<.01). Also, there was a significant positive correlation between the respondents' ecological dissonance scores (the influence system of the dean) and the Job Satisfaction Index (r = .22, p<.05). These two correlations suggest that those respondents who perceived ecological dissonance in the power usage of the dean were alienated from their work and appeared to be dissatisfied with their jobs. There was no significant correlation between the respondents' ecological dissonance scores (the dean's influence system) and the Job Involvement Index.

There was a significant positive correlation between the respondents' ecological dissonance scores (the provost's influence system) and the Work Alienation Scale (r = .26, p<.01). Also, there was a significant positive correlation between the respondents' ecological dissonance scores (the provost's influence system) and the Job Satisfaction Index (r = .20,

$p<.01$). These two correlations suggest that those respondents who perceived ecological dissonance in the power usage of the provost were alienated from their work and appeared to be dissatisfied with their jobs. There was no significant correlation between the respondents' ecological dissonance scores (the provost's influence system) and the Job Involvement Index.

There were no significant correlations between the Work Alienation Scale, the Job Involvement Index, the Job Satisfaction Index, and the respondents' ecological dissonance scores (the influence system of the president of the university).

The results of the present study supported the first hypothesis: respondents who had experienced ecological dissonance, as measured by the Index of Power Discrepancy, also experienced alienation, non-involvement, and dissatisfaction with their jobs. The ecological dissonance in the department head, dean, and provost's influence system were all significantly related to faculty work morale. Majors (1989) and Burton (1990) reported a similar relationship between student satisfaction and the equal opportunity measure of ecological dissonance. There was an indication that the ecological dissonance of the president's influence system was high but had no significant relationship with faculty work morale; however, the fact that the president is much farther away from the faculty than other administrators may suggest that the faculty was unsure about the type of power usage of the president. This phenomenon may have

caused the higher dissonance score without having a significant effect on the faculty's work morale.

Regression Analysis

Using the regression analysis helps explain the prior correlation analysis. Three independent stepwise multiple regression analyses were performed to examine the ecological dissonance scores generated from the influence systems of the department head, the dean, the provost, and the president as predictors of work alienation, job involvement, and job satisfaction.

For work alienation, a one-predictor model with the ecological dissonance of the influence system of the department head was chosen as the optimum model. This procedure indicated that the ecological dissonance generated from the department head's influence system was the best predictor of the work alienation score. The ANOVA indicated a weak multiple regression relationship between the Work Alienation Scale and the ecological dissonance which generated from the department head's influence system [$F(1,93) = 21.1$, $R^2 = .19$, $R_A^2 = .18$].

For job involvement, a one-predictor model with the ecological dissonance of the influence system of the department head was chosen as the optimum model. This procedure indicated that the ecological dissonance, which was generated from the department head's influence system, was the best predictor of the job involvement score. The ANOVA indicated a weak multiple

regression relationship between job involvement and the ecological dissonance which was generated from the department head's influence system [$F(1,93) = 13.1$, $R^2 = .12$, $R_A^2 = .11$].

For job satisfaction, a one-predictor model with the ecological dissonance of the influence system of the department head was chosen as the optimum model. This procedure indicated that the ecological dissonance, which was generated from the department head's influence system, was the best predictor of the job satisfaction score. The ANOVA indicated a weak multiple regression relationship between job satisfaction and the ecological dissonance which was generated from the department head's influence system [$F(1,93) = 14.2$, $R^2 = .13$, $R_A^2 = .12$].

Repeated Measures Analysis of Variance

To test the null hypothesis that the mean of ecological dissonance scores did not differ in the four influence systems in the organizational hierarchy, the four dissonance scores were analyzed by a repeated measures analysis of variance. Table 2 summarizes the results of the analysis of variance on the ecological dissonance scores of the influence systems of the department head, the dean, the provost, and the president.

The analysis indicated that these four ecological dissonance scores did differ significantly based on the perceived versus the preferred power usage [$F(3,279) = 6.77$, $p<.001$]. This analysis suggested that subjects did perceive different ecological dissonance, generated from subjects' preferred versus the

perceived different types of the superior's power usage. Table 3 lists the means of the four ecological dissonance scores.

The LSD post-hoc test indicated that the ecological dissonance generated from the influence system of the provost (M = 3.670) was significantly different from the ecological dissonances from the other three influence systems. Additionally, the ecological dissonance generated from the influence system of the department head (M = 2.596) was significantly different from the ecological dissonances generated from the influence systems of the dean (M = 3.000) and the

TABLE 2
SUMMARY OF REPEATED MEASURES ANALYSIS OF VARIANCE RESULTS FOR ECOLOGICAL DISSONANCE SCORES

Source	d.f.	S.S.	M.S.	F-value	Sig. of F
Between subject	93	1553.37	16.70		
Supervisors	3	56.65	18.88	6.77	.000
Error	279	778.35	2.79		
Total	375				

TABLE 3
THE MEANS OF ECOLOGICAL DISSONANCES

VARIABLES	MEAN	S.D.
ECOLOGICAL DISSONANCE (DEPARTMENT HEAD)	2.596	2.76
ECOLOGICAL DISSONANCE (DEAN)	3.000	2.48
ECOLOGICAL DISSONANCE (PROVOST)	3.670	2.52
ECOLOGICAL DISSONANCE (PRESIDENT)	3.223	2.225

president ($\underline{M}$ = 3.223). However, the ecological dissonance generated from the influence system of the dean was not significantly different from the ecological dissonance generated from the influence system of the president.

The results supported the second hypothesis that ecological dissonance would be greater for the higher levels of administration. The post-hoc tests of the means of ecological dissonance suggest that the greater the distance between the faculty and an administrator, the larger the ecological dissonance within that influence system. Although the differences in ecological dissonance levels could be a product of bias in the perceptions of the faculty, it is possible that real differences in power usage do exist. If they exist, they may be legitimate reactions to the differences in management functions that characterize the different levels of management. That is, a president or provost position may be performed more effectively

and efficiently using influence systems that would not work well for a department head.

Finally, the results indicated that different degrees of ecological dissonance created a different strength of relationships with the worker morale measures; this finding supports the third hypothesis that the ecological dissonance generated within different influence systems affects different degrees of worker morale. This outcome could be supported by comparing the correlations between the work morale and the means of the three ecological dissonance scores of the influence systems of the department head, the dean, and the provost. It was found that the ecological dissonance generated from the department head's influence system had the lowest mean but the highest and most consistent relationship with faculty work morale among those three types of ecological dissonance. The results of the regression analysis also consistently supported the notion that the ecological dissonance of the department head's influence had the most predictable relationship with faculty work morale. The results may suggest that because the department head has the closest subordinate-superior relationship with the faculty, faculty have clearer ideas and stronger expectations about the influence of the department head. The results also support the assertion that a department head's leadership style might be the most important determinant of worker morale. That fact may at least partially indicate why the ecological dissonance, generated

from the influence system of the department head, had the strongest effect on the faculty's work morale, even though this ecological dissonance was not as high as the others.

The dean is farther removed from the faculty than the department head in the organizational hierarchy. Therefore, even though the mean of ecological dissonance perceived from the dean's influence system was higher than that perceived from the department head's influence system, it did create significant relationships with faculty work morale, but not as strong as the relationship of the ecological dissonance perceived from the department head's influence system with faculty work morale.

The ecological dissonance perceived from the provost's influence system had similar and consistent results. Because the provost is much farther removed from the faculty than the department head and the dean in the organizational hierarchy, the faculty was not clear about the extent of the influence of the provost; thus, the faculty experienced less impact from this influence. In summary, these results suggest that the closer the influence system to the faculty in the organizational hierarchy, the larger the effect that ecological dissonance generated from that influence system has on the faculty's work morale. That is, the proximity of the administrator to the faculty in the chain of command appears to moderate the impact ecological dissonance has on worker morale.

Conclusions

The purpose of the present study was to investigate a new and general measure of ecological dissonance for an organization and to provide a test of Ecological Dissonance Theory (Miller et al., 1989). The results of the study supported the proposed hypotheses and suggest that the measure of ecological dissonance is a useful instrument for predicting worker morale.

The results also suggest that the measure of ecological dissonance was most useful as a predictor of worker morale when dealing with the superior who has regular contact and immediate power over the faculty members. Close examination of these data revealed that faculties tended to perceive larger dissonance in coercive and legitimate powers but less dissonance in expert and reward powers when individually comparing the five preferred power styles with the five perceived superior power styles. Further study to evaluate exactly the different dissonance levels occurring among the five power styles could help the superior to understand where the dissonance really is and thus to reduce the ecological dissonance and improve worker morale.

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