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EFFECTS OF OPEN VERSUS CLOSED PHYSICAL ENVIRONMENT ON EMPLOYEE PERCEPTION AND ATTITUDE

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We aimed to determine the effects of a closed (versus an open) physical office environment on worker attitude, perception, and interpersonal relationships. A closed environment provides for privacy but isolates employees; while, an increased interruptions. The results suggest that the use of modular furniture systems may provide physical comfort (privacy) and still maintain an interactive climate for workers in an office setting.

Keywords: open vs. closed physical environment, perception, attitude, employees,

What effects, if any, will an open versus a closed office environment have on employee attitudes and perceptions? Moreover, what factors involved in each structure make for a successful environment? On the one hand, an open office design minimizing artificial barriers gives employees greater freedom and ability to interact with one another. The closed office environment tends to inhibit social interaction to increase smaller group social cliques. On the other hand, an open office space supports many interruptions and lack of privacy, which is often a complaint among workers in such an environment. A closed configuration, of course, provides for more privacy and seclusion (Bell Fisher & Loomis, 1978; Brookes & Kaplan, 1972).

Though the results are often misinterpreted because of the "halo effect", the Western Electric (Hawthorne) experiments are usually credited with recognition of the relationship between employee attitude and perception on productivity in a work environment (Mayo, 1945; Roethlisberger & Dickson, 1939). Brayfield and Crockett (1955), however, found that there is little correlation between worker attitude and productivity. Later, Herzberg (1966) identified two categories of needs: a) those that acted as dissatisfiers which consisted mainly of working conditions, and b) those that acted a motivators. Litwin and Stringer (1968) found that authoritarian climates with central decision making and heavy emphasis on rules led to low levels of productivity, creativity, and work group cohesion. Reinforcing Herzberg's theories, these researchers also found that good interpersonal relations led to better job satisfaction, cohesiveness, and creative behavior, but did not necessarily increase productivity. Steers (1977) found that achievement-oriented environments resulted in improved job performance. Experiments by Locke (1976) and Price (1977) reinforced

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the notion that as job satisfaction decreases, turnover rises. Then there are innumerable studies in the literature showing the relationship between job satisfaction, organizational effectiveness, and job performance. Even among those which do not show a significant, positive relationship between employee attitude and productivity, there is evidence to suggest that there is such a relationship with performance and efficiency.

Many of these findings make a strong case then to support a concern about the impact of the work environment on worker attitude and perception and interpersonal relationships among them.

PRESENT STUDY

The purpose in this study was threefold: (a) to measure and evaluate the effects of behavioral attitudes, (b) to determine changes in perception, and (c) to detect changes in interpersonal relationships among groups of individual workers in a non-profit work setting when there is a change from an open-work environment to a closed one. Quite fortuitously, researchers had an opportunity to study this situation in the Junior Division at Louisiana State University, which is the college for all entering freshman. The organizational mission of this college is to provide the necessary academic, sociological, and psychological support systems to the new student to make the transition from high school to college in an open-admissions university setting. To facilitate this mission the work environment must be supportive. Academic record keeping, counseling, and student administrative action (decision) are the important operating functions of the Junior Division; consequently, they form the major departments. The *Records* department consists of four full-time employees who file, update, and control the academic records for approximately 10,000 students. These employees provide copies of records to the Dean's office and counselors for decision-making purposes. Students may also request copies of their records or other information in their file at any time.

The *Counseling Staff* members meet with students to provide academic, career, or personal guidance counseling. All counselor-student interacts are recorded on student record cards and appropriately filed in the records department.

The *Dean's Office* is the unit in which academic actions (or decision) are made regarding critical student problems such as academic probation, dismissal, or reinstatement. Clerical employees in this office do not make these decisions; instead, they provide the facilitating staff support to the administrators who do. It is the responsibility of this group to make available the complete student record for analysis and academic action by the "deans".

With an open physical layout of the records department, student, counselor, and Dean's office personnel can readily interact with records employees. Often, however, this accessibility means frequent interruptions to request information unrelated to the records employee's tasks. The installation of modular furniture made possible a private, soundproof workspace for each records employee. While restructuring the environment may limit the accessibility of employees, at the same time it alters the interactive climate of the division (Bell, Fisher, & Loomis, 1978).

So, the installation of the modular furniture gave the researchers an excellent opportunity to evaluate the extent to which this change from an open to a closed environment measurably affected organizational interaction of groups of employees, their behavioral attitudes, and their work situation. Since all three groups work interdependently with each other, the change in the physical structure must be evaluated in light of its effects on the organization as a whole.

THE WORK ENVIRONMENT SCALE (WES)

The Work Environment Scale (WES) designed by Social Ecology Laboratory, Stanford University and the Veterans Administration Medical Center, Palo Alto, CA, was selected to measure perceptions of existing work environments (Form R) prior to and after the installation of the modular units. There are 10 WES measuring factors which have been parsimoniously grouped into three main factors: relationship dimensions, personal growth dimensions, and system maintenance and system change dimensions. The scales and factor dimensions descriptions are summarized in Table 1.

TABLE 1
A SUMMARY OF FACTORS IN THE WORK ENVIRONMENT SCALES, FORM R

(A) Relationship Dimensions

1. Involvement: the extent to which employees are committed to their job responsibilities.
2. Peer cohesion: the extent to which employees show concern for and support to one another.
3. Supervisor support: the extent to which management-level personnel support subordinates and encourage them to support one another.

(B) Personal Growth Dimensions

1. Autonomy: the extent to which employees perceive their ability to make independent judgments and their own decisions.
2. Task orientation: the extent to which there is planning effort, efficiency, and effectiveness.
3. Work pressure: the extent to which the employee feels under pressure to get work accomplished within a time limit.

(C) System Maintenance and System Change Dimensions

1. Clarity: the extent to which the employee understands the level of aspiration of the job and the rules and policies of the organization.
2. Control: the employee's perception of the extent to which rules and policies are used to control them.
3. Innovation: the extent to which innovation and changes are encouraged and accepted.
4. Physical comfort: the employee's perception of the physical environment and extent to which it contributes to good working conditions.

The WES-Form R instrument was selected for its acceptable test-retest reliability as well as its profile stability for periods as long as a year. The instrument also has the capability of reflecting changes in the work environment. Because of these advantages, any number of researchers have used the WES to contrast social environments in different organizations (or subsets of one organization) or to describe different work settings.

Indeed, the form of the WES scale was tested on 1,042 employees in representative work groups and 1,601 employees in an health-care environment. (Moos, 1981). Here research findings substantiate the ability of the scales to measure distinct characteristics of the work environment. Using the WES, Brady, Kinnaird, and Friedrick (1980) studied employee perceived work environment and job satisfaction. They found that employees who perceived involvement, cohesion, support, autonomy, and innovation as positive aspects of the environment also had greater job satisfaction.

Waters (1978) used the WES to investigate law enforcement agencies and long-term health care facilities in order to facilitate changes in the organizational environment. Koran and Moos (Moos, 1981) used the WES to rate medical units in a general hospital to target need areas for change. The test was administered 3 and 9 months apart showing that positive changes had occurred. Hoibert and Pugh (1978) tested Navy enlistees during training and then one year after active duty. She found that the WES discriminated among environment of five different Navy training schools. Thus, extensive research using WES substantiates its reliability to describe the work environment (Moos, Clayton, & Max, 1979).

In summary, then, changes in employees' perceptions of the work environment can affect job satisfaction. Involvement, cohesion, supportiveness, autonomy, innovation, and supervisory relationship are all factors that have been related to job satisfaction. The WES-Form R seems to provide reasonable scales to measure these factors.

METHOD

The 24 participants used in the experiment were all full-time employees in the Junior Division at LSU; two were student workers for a total of 26 participants. Among the clerical staff, all were state civil service employees except one. Counselors are considered "non-faculty, professional" staff personnel.

Employees were divided into groups according to the organization structure of the division – Dean's Office, Counseling Office, and Records Section. Four secretaries, one administrative secretary, and one staff assistant represented the office of the dean. The head of counseling and 13 counselors participated from the counseling staff. Two specialized clerical employees, the head of records, a supervisor of student workers, and two student workers comprised the records section.

All three groups were predominantly female; only four participants were males. Educational backgrounds ranged from high school diplomas to masters degrees (including education specialists) in counseling. Approximately one-third of the participants supervised one or more employees.

Each group met with the same test administrator. Participants received a pretest copy of the WES-Form R prior to the installation of the modular units. Participants were told that "the administration was interested in the employee's perception of the work environment". The test administrator emphasized that all responses would remain anonymous.

To allow any possible residual effect to subside from the installation process itself and to minimize recall, the posttests were given six months later. Each group was asked to complete the questionnaire in the same controlled experimental conditions.

RESULTS

Preliminary data analysis involved the computation of means and variances for each group before and after the installation of the modular furniture. Total sums of squares were divided among groups for both batteries of test accordingly:

1. Sum of squares between all components of employees on first and second test.
2. Sum of squares among groups (records office, dean's office, counselors) of employees within the first test.
3. Sum of squares among groups of employees within the second test.
4. Sum of squares among observations with groups.

Using analyses of variance (ANOVAs), we tested the following null hypotheses:

(1) That the mean test scores of each group of employees (records, dean's office, and counselor) did not differ significantly from one another with the open environment (prior to installation of the modular furniture).

(2) That the mean test scores of each group of employees did not differ significantly after the installation (closed environment).

(3) That the mean scores of the total group of all employees did not differ significantly when compared between the open configuration and the closed one. At $p < .05$ level of significance, null hypotheses were accepted for involvement, peer cohesion, supervisory support, clarity, and control in all three cases. From an organizational perspective, it is consequential that these factors show no significant change for the group as a whole after the installation of the modular furniture. While the partitions were able to insulate the individuals in a physical way, these results indicate that they were not isolated emotionally or behaviorally.

The factors which did show statistically significant change before and after are summarized in the following Table 2. While care must be taken in using post hoc analysis in any case, there little questions that creature comfort was increased significantly with the new modular equipment. The possible negative effects towards socialization among workers in a closed environment did not occur here (Bell, Fisher, & Loomis, 1978). The results suggest that the change brought on fewer differences among groups of employees than might have expected since there seemed to be more homogeneity among the factors as perceived by the different groups.

TABLE 2: RESULTS OF ANALYSIS OF VARIANCE AND "F" TEST WHERE THE NULL HYPOTHESIS WAS REJECTED IN AT LEAST ONE OF THREE CASES

Factor	*Null Hypothesis Rejected**		
	Before Modular Classes of Employee	*After Modular Classes of Employee*	*Before and After Modular, Total Group*
Autonomy	*Yes*	*No*	*NA (No)*
Task Orientation	*Yes*	*No*	*No*
Work Pressure	*Yes*	*Yes*	*No*
Innovation	*Yes*	*No*	*No*
Physical Comfort	*No*	*No*	*Yes*

*

"F" Test run at .05 Level of Significance.

Unlike other similar experiments, the relationship dimension showed a significant increase in involvement by the records group after the work environment was made private. The use of modular furniture (privacy with a degree of openness) may have made the difference. This increase did not occur in the other two groups, but neither was their work environment substantially altered. Other subscales in this dimension did not show any significant change.

In the personal growth dimension, only the dean's office group differed markedly from the other two after the installation. Their autonomy subscale decreased significantly. The records subscale for work pressure was significantly and consistently higher that the other two groups.

Interestingly, in the dimensions of system maintenance and system change, the subscale for physical comfort was significantly higher in the posttest for all three groups, particularly for the records group, which was most directly affected. In summary, then, the change to a closed physical environment provided the physical comfort and privacy desired by the records employees. The only measurable significant adverse effect from the change in work environment was in the autonomy subscale of employees in the dean's office, who were only indirectly involved with the physical change. It may be that these results can be explained by the use of modern modular office systems rather than those which completely isolate workers from one another. Certainly they suggest the necessity for follow-up studies in the use of these modular systems.

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