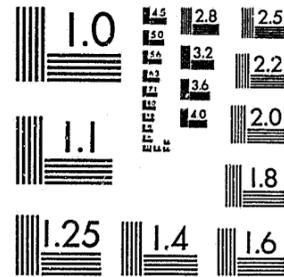


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FUNCTIONAL UNIT MANAGEMENT:
AN EVALUATION OF ORGANIZATIONAL EFFECTIVENESS
IN THE FEDERAL PRISON SYSTEM

by
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ACQUISITIONS

ABSTRACT

Title: Functional Unit Management: An Evaluation of Organizational Effectiveness in the Federal Prison System

Functional Unit Management can be described as an organizational style which decentralizes and therefore flattens the administrative structure of a prison within the Federal Prison System. Although Functional Unit Management (FUM) was initiated as a tool of classification and rehabilitation, it is proposed that the historical shift in goal orientation in corrections has mandated that the contemporary focus of FUM be on the goal of "humane control". The decentralized, team oriented approach of Functional Unit Management is appropriate to applications in the field of correctional administration and the goal of humane control.

The ability of Functional Unit Management to bring about more humane control was empirically tested at the Federal Correctional Institution at Lompoc, California. The levels of inmate grievances and administrative remedies (inmate grievances) are used as indicators of the institutional atmosphere of humane control. The method used is interrupted time series analysis which is well suited to measuring intervention effects in data aggregated by discrete time units.

The results indicate basically no effects for Functional Unit Management on the institutional level of humane control as measured by variations in the selected dependent variables. Broad interpretation of the results is unwarranted, however, due to unavoidable problems in the conceptual and methodological design used in this particular study.

INTRODUCTION

Prisons have endured a continuing academic and social debate concerning the primary function which they provide society. The goal of rehabilitation has remained high on the list of manifest functions of the prison. Correctional historians have outlined several dominant themes in the changing goals of prison organizations. In their turn, religious, educational, vocational, psychological, and sociological perspectives have held predominance as the primary theoretical tool to be used in the task of eliminating or reducing crime (Lejins, 1978).

To a large degree, the organizational style of prisons has reflected the particular rehabilitative philosophy which was under acceptance by correctional authorities at the time. Included in the concept of "organizational style" are physical structure, types of personnel, administrative structure, and ongoing activities (Duffee, 1980). An example of the concurrence of organizational style and rehabilitative philosophy is the early "Pennsylvania style" penitentiary and its emphasis on solitary penitence.

After a long, if not somewhat questioning, relationship there has been a recent disaffection with the rehabilitative approach and the medical model of corrections. At the core of this disaffection have been the issues of prisoner's rights (American Friends Service Committee, 1971), court intervention in the operations of correctional institutions (Carlson, 1976) and dissatisfaction with the results of the rehabilitative model (Lipton, Martinson, and Wilks, 1975). Intertwined throughout these issues is the notion that correctional authorities have used the manifest goal of rehabilitation as a tool to increase control over inmates, often in an unjust and arbitrary manner. An explicit example of this is the use of the indeterminate sentence. Originally a tool of

the rehabilitative model, the indeterminate sentence is now used to threaten unruly inmates with longer periods of incarceration.

While courts continue to sentence offenders to long prison terms, skepticism with the rehabilitative model has left a void in the goals of correctional organizations. Faced with this void, correctional administrators are at an impasse. They must maintain penal institutions without the noble goals of rehabilitation, but within the constraints of humanity not only imposed by themselves, but the courts and general public.

From an organizational perspective, this absence of the lofty rehabilitative goal creates some pressing problems. As Lejins (1978) has observed, one of these problems is filling the gap in the daily routine of the inmate. Another less obvious, but parallel problem is the maintenance of effective control over the inmate. Clearly, when activities such as counseling, education, or penitence are not coerced, control over the inmate's institutional activities becomes a more difficult task. This is especially true in large institutions, where inmates can more easily become lost in a crowd.

A third problem presented by the decline of the rehabilitative model is the issue of the duties of the large body of professional, rehabilitative-oriented correctional personnel (Lejins, 1978). When their services were necessitated by the required nature of inmate participation, these personnel were often made responsible for more bodies than they could manage. Given the shift in focus away from the mandatory rehabilitative philosophy, the perspectives and duties of professional rehabilitative personnel will have to change.

As early as 1975, in response to the growing skepticism with the rehabilitative model, director of the Federal Prison System, Norman Carlson had defined the goal of his organization as humane control, with ample opportunity for the inmate to participate in self-rehabilitative therapy if he or she so desires (See Lejins, 1975, p. 59). The concept of "humane control" connotes

a situation in which inmates are treated fairly and justly. Nevertheless, the institutional environment requires a sufficient degree of control so that it will be dangerous to neither inmates nor staff. Additionally, Carlson (1976) has set forth the policy that inmates will be given every opportunity to participate in treatment-oriented programs on a voluntary basis.

The adoption of the goal of humane control and the concurrent rejection of the goal of coerced therapy presents the Federal Prison System with some additional organizational problems. As indicated above, these problems include the role of the inmate in the institution, the role of professional correctional staff, and the maintenance of adequate institutional control by correctional authorities. Partially in response to these problems, the Federal Prison System has recently adopted an organizational style designated Functional Unit Management.

A Description of Functional Unit Management

Functional Unit Management (FUM) can best be described as a management technique which decentralizes the organizational structure of a prison. In effect, the implementation of this style restructures a large institution into several mini-institutions (units), which coexist in the same prison. "A unit is a small, self contained inmate living and staff office area which operates semi-autonomously within the confines of the larger institution." (Lansing, Bogan, and Karacki, 1973 p.43) Clerical, educational and psychological departments are no longer independently responsible for their respective functions, but serve as resource centers for their representatives within each unit. The unit represents a relatively autonomous sub-organization composed ideally of 50-250 inmates and their respective staff.

In contrast to the specialized function required in a traditional bureaucratic structure (e.g. the inmate goes to the department of psychology for

counseling), the unit staff must now take on a more all encompassing role by providing more direct service to the inmate in the unit. In addition, by involving the staff in the day-to-day lives of inmates, it is hoped that more non-coerced control will be achieved.

The seeds of the development of Functional Unit Management were planted in an era when rehabilitation and classification were primary concerns. As the goals of the Federal Prison system changed, FUM evolved into an organizational style, with goals conceptually different from rehabilitation-classification. The shift in conceptual goals from rehabilitation to humane control occurred in the same period (the early 70's) as the transition from classification to management style for Functional Unit Management. The notion of smaller basic groups combined with more personal representation by those providing services to inmates is consistent with the concept of humane control.

The stated goals of unit management reflect the ultimate goals of the Federal Prison System:

1. To establish a safe, humane environment which minimizes the detrimental effects of confinement and;
2. To provide a variety of counseling, social, educational and vocational training opportunities and programs which are most likely to aid inmates in their successful return to the community.

The contributions which unit management is expected to make toward the attainment of these goals rests primarily on the assumed advantages of staff-inmate and inmate-inmate familiarity. The major advantage of unit management is that:

It increases the frequency of contacts and the intensity of the relationship between staff and inmates, resulting in:

- a. better communication and understanding between individuals
- b. more individualized classification and program planning
- c. more valuable program reviews and program adjustments of problems before they reach critical proportions
- d. development of common goals which encourage positive unit cohesiveness, and
- e. generally, a more positive living and work atmosphere for staff

- f. and inmates
more efficient accountability and control of inmates

(Unit Management Manual, 1980, p.2)

Given the historical development of correctional philosophy, with the current de-emphasis on rehabilitation as a primary goal, and increasing stress on control, this research focuses on the goal of humane control. More specifically, an attempt was made to measure the effects of the implementation of Functional Unit Management on the goal of humane control within the institutional setting. This work does not attempt to draw conclusions about the effect that humane control ultimately has on the larger focus of the crime problem in society. A relevant perspective on the relationship between just, humane control in the prison setting and its effects on the reduction of crime is developed by Fogel (1975).

Previous Evaluations of Functional Unit Management

All previous attempts to evaluate effectiveness of unit management have been internal to the Federal Prison System. A major part of these evaluation efforts revolved around the use of the Correctional Institution Environment Scale (CIES). The CIES contains nine basic dimensions:

- Involvement (Esprit de corps of unit)
- Support (Staff encouragement and assistance)
- Expressiveness (Open expression of feelings by staff and inmates)
- Autonomy (Encouragement of inmate initiative and leadership)
- Practical Orientation (Emphasis on job training and release planning)
- Personal Problem Orientation (Concern with and understanding of personal problems and feelings)
- Order and Organization (Inmate appearance and housekeeping standards)
- Clarity (Explicitness of program and staff expectations)
- Staff Control (Reliance on rules for inmate control)

Both residents and staff have been surveyed using the CIES instrument. An analysis of relevant CIES profiles across all institutions in the Federal Prison System by Lee (1980) produced generally positive results. A comparison of pre and post Functional Unit Management attitudes as measured by the CIES, indicated

improved attitudes toward the institution and the confinement situation after the implementation of unit management. However, this preliminary research failed to control for numerous competing explanations. As Lee (1980) points out, these findings are to be interpreted with caution: "due to a lack of knowledge about such factors as changes in the characteristics of inmate populations or staff; changes in administrations, policy or programs; and numerous other circumstances and conditions [which] may account for variation in CIES profiles from one survey administration to another, even within the same institution." (p.3). Lee (1980) also points out that determination of exact dates of implementation of the unit management program, and the often drawn out process of implementation, complicate our interpretation of CIES results.

Others (Rowe et al, 1976) have attempted to measure the effect of unit management on the frequency of "inmate incidents". "Incidents" are officially recognized cases of inmate misconduct ranging in seriousness from talking back to an officer to murder. This effort involved a survey of several institutions regarding disruptive incidents, assaults, and escapes. Using a measure of the partial implementation of unit management as a dependent variable and attempting to control for inmate density, their findings were inconclusive (Rowe et al, 1976, p.4-5). Because Functional Unit Management is an institution-wide alteration in management structure involving physical remodeling, staff deployment, and change in program emphasis, the measurement of institutions which had only partially implemented unit management resulted in serious confounding.

In 1975, Bogan, Karacki, and Lansing surveyed eleven previous attempts by the Federal Prison System to evaluate the effects of unit management. The dependent variables used in these studies included personality profiles, recidivism rates, and incident data. Although there were some inconsistencies, in general the results of these evaluations indicated positive results for

Functional Unit Management. Indeed, the positive results from these early evaluations were a major factor in the decision to introduce unit management as the organizational style of the federal system (Unit Management Manual, 1980, p.5) Bogan, Lansing and Karacki (1975) summarized:

...the research results to date indicate that functional unit management has generally positive effects on institutional variables; its effects on personal adjustment or post-institutional variables have yet to be demonstrated. It should be remembered that functional unit management as a program and management tool is, in most institutions, in its infancy. A longer period of time and a complete research effort is required to assess the true impact of functional unit management.

(p.17)

Critiques of Previous Research. Previous evaluations of unit management have been flawed by both methodological and conceptual problems. Most investigations have used a single pre and a single post FUM implementation measurement. This is seen in the studies involving the CIES. In some studies measures of incident rates, and inmate or staff attitude have been aggregated and averaged in a single pre and post FUM time frame. This approach threatens the validity of the research by failing to investigate the dynamics of the effects of unit management. For instance, unit management may cause a temporary increase in positive attitudes, followed by a resumption of earlier levels of institutional climate (a "Hawthorne" effect). Therefore, the reported effects of the implementation of FUM would vary depending on the time frame in which the survey was administered.

Additionally, an attempt to measure the effects of a complex organizational arrangement such as unit management while ignoring concurrent organizational developments such as personnel or inmate population changes, may be misleading. Of all of the studies reported to date, none has attempted to control for such developments.

Finally, some of the more comprehensive evaluations were completed earlier in the development of unit management. Consequently, those evaluations were

concerned primarily with the effects of unit management as a classification or rehabilitation technique within specialized units, rather than as a total reorganization of an institution with the more recently adopted policy of humane control.

The methodology described in the following section was developed with the weaknesses of previous research efforts in mind. The research setting was one in which behavioral data is available over time. The aggregate time periods (weeks) are small enough to observe the dynamics of fluctuations in the dependent variables in response to the introduction of Functional Unit Management. Also, this type of data aggregation made it possible to separate the effects of unit management from other events occurring in the institutional setting. Other events such as major personnel or policy changes were documented and separated from the effects of unit management to the extent possible.

The time period for the study (1975-1977) was one in which "humane control" had been established as a primary goal in the Federal Prison System. Therefore the variables used to measure organizational effectiveness were selected to reflect this goal rather than classification or rehabilitation.

METHODOLOGY

The Research Setting

The research setting for this research project was the Federal Correctional Institution at Lompoc, California. FCI Lompoc was chosen because it is a major institution (Approximately 1000 inmates.) and Lompoc shifted to unit management during the era of "humane control" as a primary goal for the Federal Prison System (1976). Except for a drug unit, inmate assignment to units was on an availability basis.

At the time that Lompoc underwent the transition to unit management, it was a medium security level institution. This security designation at the time

of the implementation of Functional Unit Management characterizes Lompoc as an average federal prison, on a par with most state institutions. This similarity enhances the generalizability or external validity aspects of the study.

Optimally, in a pure experimental design, a second institution, or a portion of Lompoc that was not undergoing a change to unit management would be used as a control. However, no similar data are available from other institutions in the same historical time frame, and the whole of Lompoc changed to unit management at about the same time. Although some units were physically remodeled before others, it would be fallacious to use a section of Lompoc as a control. The lack of a comparison or control group precludes the use of a pure experimental design.

The Variables

This research focuses on the general organizational goal of "humane control". Humane control can be defined as the maintenance of a safe, humane environment which minimizes the detrimental effects of confinement (Unit Management Manual, 1980, p.2). The Federal Prison System hopes to capitalize on the inmate-staff and inmate-inmate familiarity fostered by Functional Unit Management to further the attainment of that goal. Two variables were used to measure the degree of humane control at Lompoc:

1) Incidents. An incident is recorded if a correctional officer believes that an action by an inmate is sufficiently severe to warrant official action. The frequency of incidents, taking into account their severity, which is also recorded, will be used as a general indicator of both the tenseness of the environment at the institution and the need for the use of official channels to maintain control. It is assumed that if unit management is achieving the goal of humane control, both the number and seriousness of reported incidents should decrease.

It was anticipated that the reporting of less serious incidents might temporarily increase during the early stages of FUM implementation, due to increased intensity of supervision. However, more serious incidents were expected to decline in number. For this reason, incidents were dichotomized according to seriousness, and analyzed separately.

2) Administrative Remedies. The administrative remedy is the inmates' channel for registering a complaint of unfairness against any correctional worker or any decision by a correctional worker. It was assumed that as the quality and quantity of inmates' interaction with staff, especially decision making staff, increased, the number of times that inmates must rely on official channels of grievance would decrease. Therefore, the implementation of unit management should cause a decrease in the number of administrative remedies filed.

Both above variables are unobtrusive measures (Webb et al, 1966, p. 53-87). That is, they were not originally collected for experimental purposes. Aside from the relatively low cost of acquisition, Webb et al (1966) point out that a common benefit to be derived from this type of data is its "nonreactivity" (p.53). It is highly unlikely that either of the above variables were being altered in anticipation of a study of the effectiveness of unit management.

Also, since the use of both incident reports and administrative remedies are discretionary activities, it is possible that a change in management style will alter the nature of the reporting rather than the quality of humane control. Cook and Campbell (1979) refer to this threat of confounding as a problem of "construct validity" (p.59). This threat represents a problem not unlike problems associated with crime reporting rates. That is, the primary method of measuring the frequency of incidents rests with their official recognition. In this study it was assumed that both inmates and staff frequently resolve

these problems (inmate misconduct or complaints against the system) informally, and the attainment of this informal resolution is, in and of itself, a reflection of more effective and humane control.

In his analysis of crime reporting behavior, Black (1970) suggests that increased familiarity between the perpetrator of a crime and the complainant increases the likelihood that the situation will be handled informally. Blacks' analysis suggests that increasing inmate-inmate and inmate-staff familiarity under Functional Unit Management will increase the informal handling of incidents and administrative remedies, despite the greater intensity of staff supervision.

The organization of the data in a weekly format presented some distinct disadvantages. Many variables which would contribute to the understanding of correctional climate simply do not occur frequently enough to be aggregated in this manner. Some of the variables considered but eliminated for this reason were suicide attempts, escapes, violations of furloughs, and attitude surveys (The CIES). Most of these variables were so rare that their occurrence could easily be influenced by factors completely outside the realm of institutional policy. The CIES survey administered in December, 1976 exemplifies this problem. A day or two before the institution-wide administration of the survey, an inmate was shot trying to escape. The CIES was developed to measure overall institutional climate. However, institutional climate would be temporarily modified by an event such as this. Cavior (1977) notes that staff and inmate participation were perceptibly lower in the 1976 administration of the CIES than in earlier administrations, and the results of that survey indicated no measurable change in attitudes after the adoption of Functional Unit Management. The post-FUM CIES results at Lompoc did not typify the pattern of improvement in climate reported at other institutions (Lee, 1980). A possible explanation for this irregularity was the untimely administration of the CIES near an

unusual institutional event.

Design

The methodology consisted of intervention analysis in an interrupted time series design. The data will be analyzed for a three year period broken down in weekly increments, thus leading to approximately 156 observations for each variable under study. Approximately thirty weeks of data are available before the introduction of Functional Unit Management (see Figure 1).

Time series analysis is an extremely useful, but relatively new, method to the social sciences. Basically, it is a statistical modelling technique requiring a sophisticated software package. This package is currently available as an addition to the widely used BMDP software series which is accessible at most major computing centers involved in statistical analysis (Liu, 1979). The particular method of time series modelling which will be utilized in this study will be the Box and Jenkins (1976) Autoregressive Integrated Moving Average (ARIMA) model.

Intervention analysis (Box and Tiao, 1975; Bhattacharyya and Layton, 1979) becomes relevant when we add an independent variable I_t to the model. In its most simple sense, the intervention factor can be thought of as equal to 0 prior to the point in time t in which the intervention took place and equal to 1 after that point in time. For instance, if an intervention takes place during the 76th week of the time series, then I_1 to $I_{75} = 0$ and I_{76} on = 1. This component is then added to the model and tested for significance using the Student's "t" test.

Fortunately, the response to the impact or intervention can be interpreted more flexibly than a simple "step" function. The addition of a qualifying parameter to the 0-1 intervention component allows the investigator to test for the significance of interventions which are gradual at onset and permanent in

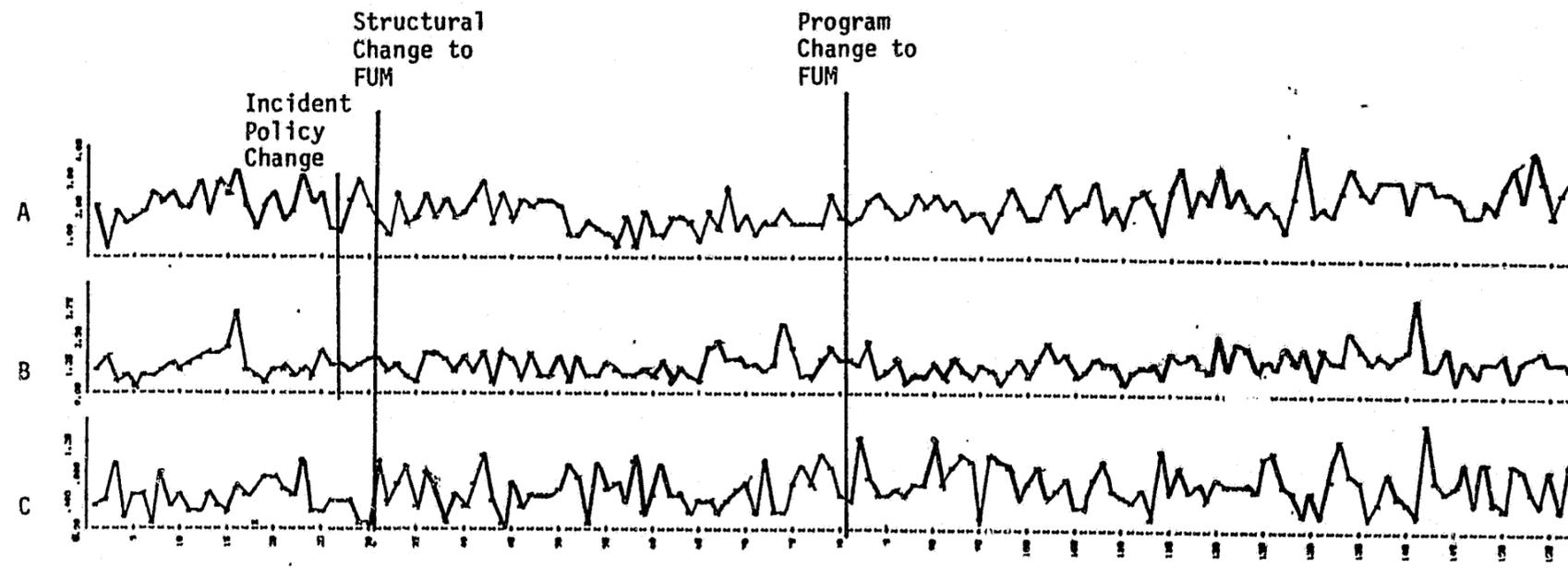


Figure 1. Time line for implementation of FUM at FCI, Lompoc.
 A = Less Serious Incident Rate B = Serious Incident Rate C = Administrative Remedy Rate

duration, as well as those that are abrupt at onset and temporary in duration (McDowell, et al, 1980, p.21; McCain and McCleary, 1979, p.62).

Procedure

The incident and administrative remedy data was obtained from the West Coast Regional Office of the Federal Prison System. Each case was individually identified by inmate number and date. The data was "cleaned" for out of range and missing values. The incident data was dichotomized according to seriousness level (See Appendix B). All three data bases were then transformed from individual records to a count-by-week format. Inmate population figures for Lompoc were then extracted from data banks in the Department of Justice computer. The counts were divided by the population figures and multiplied by 100 to give an index of "rate per 100 inmates." This procedure has the effect of controlling for the inmate population at Lompoc which varied by as many as 200 over the time period under investigation. Starting January 1, 1975 the data reflect seven day aggregate rates of each variable.

Each time series was subjected to the iterative ARIMA model building strategy of identification, estimation, diagnosis and metadiagnosis suggested by McCleary and Hay (1980). Once this process had eliminated the systematic relationships likely to be produced in time-series type data, the ARIMA component was identified and the interventions introduced into the model. This analysis followed the suggestion of McDowell et al (1980, p.84) and first tested an abrupt temporary impact for all independent variables. With the knowledge gained from that intervention test, the most accurate statistical form of the impact was determined.

For the incident data, the first intervention introduced reflected a July 7, 1975 alteration in incident handling policy. The August 1, 1975 change to the organizational structure of unit management and the July 7, 1975 change to

the programming aspects of unit management were then tested. Since there was no direct change in policy relating to administrative remedies, that time series was tested with only the unit management interventions. The null hypothesis for these tests were stated as follows:

H_0 : The intervention in question had no effect on the level of the time series being analyzed.

The appropriate test of significance is the t-test.

Once the interventions are accepted or rejected, the total models were rediagnosed for their accuracy.

RESULTS

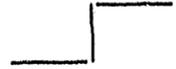
The full ARIMA and impact assessment is represented algebraically below:

$$Y_t = f(I_t) + N_t$$

where

Y_t = the value of an observation Y at time t

$f(I_t)$ = the intervention component, sometimes referred to as a transfer function. For purposes of this investigation, $f(I_t)$ will be represented in one of three ways:

1) $\omega_0 I_t$ or a zero order step function 

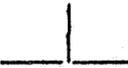
$I_t = 0$ at all times preceding the intervention.
 $= 1$ at the time of the intervention and all following times.

2) $\frac{\omega_0}{1-\delta_1(B)} I_t$ or a first order step function 

$I_t = 0$ at all times preceding the intervention.
 $= 1$ at the time of the intervention and all following times.

δ_1 is constrained by the "bounds of system stability" (McCleary and Hay, 1980, p. 155) $-1 < \delta_1 < +1$

B is called a backshift operator such that
 $B(Y_t) = Y_{t-1}$

3) $\frac{\omega_0}{1-B}$ or a first order pulse function 

$I_t = 1$ at the point of the intervention.
 $= 0$ at all other times.

δ_1 is again constrained to the bounds of system stability.

N_t = The ARIMA component of the time series. The ARIMA component is represented by three basic factors:

- 1) θ_0 or the slope of the stationary series.
- 2) Autoregressive processes of order (p) where a first order autoregressive process is represented by

$$Y_t = \phi_1 Y_{t-1} + a_t$$

a second order autoregressive process is represented by

$$Y_t = \phi_1 Y_{t-1} + \phi_2 Y_{t-2} + a_t$$

a_t = randomly distributed, equally covariant error (white noise).

ϕ_1 is constrained to the "bounds of stationarity" (McCleary and Hay, 1980, p.56) $-1 < \phi_1 < +1$

- 3) Moving average processes of order (q) where a first order moving average process is represented by

$$Y_t = a_t - \theta_1 a_{t-1}$$

and a second order moving average process is represented by

$$Y_t = a_t - \theta_1 a_{t-1} - \theta_2 a_{t-2}$$

a_t = randomly distributed, equally covariant error (white noise).

θ_1 is constrained to the "bounds of invertibility" (McCleary and Hay, 1980, p.62) $-1 < \theta_1 < +1$

Most social science data are well represented by first order autoregressive and moving average components.

This investigation studied the behavior of three separate time series (the rate of serious incidents per 100 inmates, the rate of less serious incidents per 100 inmates, and the rate of administrative remedies per 100

inmates). The model building and intervention testing for these series will be reported one at a time. An initial visual inspection of all three raw series (figure 1) suggests that they are all relatively stable both in level and in variance. They do not seem to reflect changes at the various posited intervention points.

Administrative Remedies

The first differenced ACF and PACF for the administrative remedy series suggest a first order moving average component. When this component is entered into the model, θ_1 takes on the value of .9364 with a t value of 36.76, clearly significant at the .05 level with 155 degrees of freedom. θ_1 is within the bounds of invertability. The resulting residuals from this model resemble white noise with a non-significant Q of 30.7 at the .05 level with 30 degrees of freedom. θ_0 or the mean of the once differenced series is .0042 with a t value of .0112, insignificant at the .05 level and is dropped from the model. Thus, the ARIMA noise model for administrative remedy rates is

$$Y_t = \frac{1 - .9364B}{1-B} a_t$$

Intervention testing. Intervention testing for all series followed the general approach described below. All interventions were tested in the order in which they were introduced into the series, and if significant, retained in the model. For each intervention, the first test was a first order pulse function. As McCleary and Hay (1980, p.168) and McDowell et al (1980, p.83) point out, the results of the first order pulse function test, especially the value of the δ parameter, is likely to lead the investigator to the most accurate representation of the impact. Although there may be some a priori suggestion as to the form of the impact for all three of these series, (e.g. a first order step function decreasing for administrative remedy rates when unit management is introduced) this suggestion is not strong enough to rule out rival tests of

the form of the impact hypothesis.

For the administrative remedy rate series, the first intervention was at 30 weeks, when the organizational structure at Lompoc was officially changed to Functional Unit Management. The introduction of the first order pulse function yields the following parameter estimations:

$$\theta_1 = .9959 \text{ (t= 51.71)}$$

$$\omega_0 = .2399 \text{ (t= 3.29)}$$

$$\delta_1 = 1.0040 \text{ (t=701.00)}$$

Although the θ_0 parameter is significant and acceptable, the δ_1 value is outside the bounds of system stability. This high value for δ_1 however, implies that the effect is not damping out as would be expected in a pulse function. A zero order step function is implied. The results of the zero order step impact are:

$$\theta_1 = .9616 \text{ (t= 45.64)}$$

$$\omega_0 = .1792 \text{ (t= 2.18)}$$

The ω_0 value is significant beyond the .05 level with 154 degrees of freedom. This value can be translated to mean an increased level of approximately .18 administrative remedies per 100 inmates per week in the time period in which Lompoc changed its organizational structure to Functional Unit Management.

The first order step function was tested with the following results:

$$\theta_1 = .9646 \text{ (t= 47.33)}$$

$$\delta_1 = .4475 \text{ (t= .49)}$$

$$\omega_0 = .1094 \text{ (t= .60)}$$

The impact parameters are insignificant and thus unacceptable. The most appropriate form of the intervention then was the zero order step function. This component will be added to the model.

During the 80th week of the series, a new warden arrived and immediately began implementing many of the programs associated with Functional Unit Manage-

ment. The time period representing this intervention did not significantly impact the administrative remedy rate series. Although not statistically significant, an impact at period 80 worth noting was the zero order step function. The ω_0 parameter indicated an average increase in level of .122 administrative remedies per 100 inmates per week with a standard error of .079.

The final model for the administrative remedy rate series is representative of the increase in week 30 and the ARIMA noise model. The parameters of the modelling process are reflected in Table 1. The final algebraic model is:

$$Y_t = .1792(I_{30}) + \frac{1 - .9616B}{1 - B} (a_t)$$

The residuals of this model resemble white noise (Q = 29.1 with 28 degrees of freedom).

Serious Incident Reports

Noise Model. The ACF and PACF of the first differenced series again suggest an ARIMA (0,1,1) model. The reader will note that differencing (subtracting the value of Y_{t-1} from Y_t for the entire series) has the effect not only of detrending the series, but of inducing a moving average (q) component as well. As long as the moving average component is later modelled out to leave a cleaner error process, this procedure is advisable. The introduction of a first order moving average component to the once differenced serious incident rate series yields the following parameters:

$$\theta_0 = .189 \text{ (t= .285)}$$

$$\theta_1 = .8890 \text{ (t= 24.340)}$$

The trend component is insignificant and dropped from the model. The first order moving average component is significant at the .05 level. The ACF and PACF of the error from this model indicate a white noise process with a Q of 21.0 at lag 30. The noise model for the serious incident rate series is

represented by:

$$Y_t = \frac{1 - .8890 B}{1 - B} (a_t)$$

Intervention testing. For both incident rate series, the first proposed intervention was the change in incident policy at week number 26 in the series. If the intervention proved to be significant, it was kept in the model, thus controlling for any effect a change in policy had on incident or incident reporting behavior.

Table 2 summarizes the parameters of the impact tests for the serious incident report rate time series. In general, none of the tests were significant at the .05 level, although there is some indication that there was a decrease in the rate of reported serious incidents at the program intervention (week 80). The null hypothesis that there was no change in the level of the serious incident rate at any of the three interventions is accepted.

Less Serious Incident Reports

Noise Model. After many different models were fit to the less serious incident rate series, the most efficient is an ARIMA (0,1,1)₄ model.

$$Y_t = \frac{1 - .6519 B^4}{1 - B^4} (a_t)$$

Intervention Testing. As with the serious incident reports, none of the forms of the impacts yields statistically significant results at weeks 26, 30, or 80. The summary of parameters for the modelling process for this series is presented in Table 3.

DISCUSSION

In light of the historical context of the development of Functional Unit Management and the stated policy of the director of the Federal Prison System, it has been asserted that the primary goal of this management style is the establishment and maintenance of an organizational climate conducive to "humane

control". Although unit management was expected to contribute to voluntary participation in rehabilitative programs by inmates, the primary focus of this effort has been on the issue of humane control. Hence, the present study attempted to measure the impact of the implementation of unit management on the level of humane control in a Federal Correctional Institution. The frequency of incident and administrative remedy reports was utilized as the operational indicator of the extent of humane control.

It was expected that a more personalistic approach to prison management would help fill the void in correctional goals left by disenchantment with the medical model of rehabilitation. Functional Unit Management's team-oriented, decentralized structure was expected to result in a significant reduction in the need for coercive psychological or corporal control of inmates. It was also expected to contribute to formalizing and stabilizing some of the previously informal patterns of authority and communication which exist in the prison setting.

An analysis of the data, using a simple interrupted time series quasi-experimental design suggests that in general, there were no changes in the dependent variables following the introduction of Functional Unit Management at the Federal Correctional Institution at Lompoc, California. Clearly, these results are not an indication that Functional Unit Management is not a worthwhile organizational style in the correctional setting, or even that it was not a success at FCI Lompoc. The flaws associated with drawing such unguarded and general conclusions from the results of this investigation are outlined below.

Goal determination and operationalization. As Weiss (1972) has pointed out, program goals are often hazy and ambiguous. A major part of the evaluator's task is to determine the exact nature of program goals, or to choose the most salient objective(s) from "... a long list of pious and partly incomplete

platitudes." (Weiss, 1972, p.25). Glaser (1973) has also recognized the difficulty involved in translating officially mandated goals into unambiguous measures of performance. Functional Unit Management suffers from this official goal ambiguity. As reported earlier in the Unit Management Manual (1980), the Federal Prison System expected unit management to contribute to almost every phase of the correctional experience. By sifting through available evidence and putting unit management in historical perspective, we have attempted to elucidate the objectives of Functional Unit Management. However, it is apparent that in the process of focusing on humane control, some of the larger picture of FUM was lost.

Similarly, the attempt to operationalize humane control in terms of incident and administrative remedy reports is vulnerable to the criticism of overspecification. These two variables were used as behavioral measures of the concept of humane control. However, it is quite conceivable that humane control improved in the institutional setting while, for various reasons, the level of incident or administrative remedy reports remained unaffected. Given that this study was retrospective in its historical focus, attitudinal measures and other behavioral measures of humane control were unavailable. Future research in this area should seek to provide more insight into the measurable dimensions of humane control.

External validity. Due to the constraints of data availability, only one institution was utilized in this research. Ideally, data would have been available from several institutions that had implemented unit management programs at different points in time. This approach would have enabled us to employ a more powerful design such as Cook and Campbell's (1979, p.213) "interrupted time series with switching replications". The advantages of this design are twofold. First it provides for the introduction of a control group

and thus approximates more closely a true experimental design. It also enhances external validity by sampling two subgroups of the population.

Even if this more rigorous approach were utilized, special caution regarding external validity in the institutional setting would be warranted. Prisons are unique places, that tend to be unaffected by the generalizing influence of open society. Because of the uniqueness of individual institutions, the quantity or quality of behavior as well as the reporting of that behavior, is highly dependent upon the particular institution. The confounding characteristic of the individuality of prisons make interinstitutional comparisons difficult.

An additional threat to validity in correctional research is the prison system's jurisdictional barrier. The characteristics of federal, state, and local jurisdictions (such as the nature of the offender and the educational level or training of staff) may vary to a large degree. These characteristics should be taken into consideration when generalizing the results of an investigation to all prison settings.

Organizational change. In lieu of specific evidence to the contrary, this study has assumed that Functional Unit Management was fully implemented on the dates represented by official actions. The administrative, authoritative, and program structures did indeed begin on the announced dates. However, one of the primary intermediate objectives, inmate-staff familiarity, which was expected to contribute to achieving the ultimate goal of enhanced humane control, is difficult to isolate in terms of time. To determine exactly how familiar staff and inmates must be with each other in order to create a more open and trusting atmosphere is problematic. Whether or not familiarity, as an intervening process, enhances humane control is itself a valid research question. Future evaluations will do well to test assumptions concerning mediating pro-

cesses before drawing any definitive conclusions.

It may also be that data aggregation by weeks represents too fine a distinction for testing organizational change. Monthly data may be more appropriate for testing variations in organizational structure. Again, limitations on the availability of data made monthly aggregation infeasible for this particular investigation.

Accomplishments of the Study

Despite the limitations outlined above, this investigation makes a significant contribution to the evaluation of Functional Unit Management as an organizational style. First, it presents an organizational, historical, and theoretical framework for quantitatively testing the success of unit management. This framework, although it may not reflect all aspects of a multi-faceted organizational structure, provides future evaluators with an analytical context within which to work. Second, the quasi-experimental design known as an interrupted time series is exemplified. This research paradigm helps to eliminate many of the methodological problems associated with measuring change over time.

Finally, the results derived from this research are informative at their face value. Despite some of the problems associated with drawing general conclusions from these findings, the results indicated that the change to unit management was accompanied by no significant change in incident reporting rates and only a slight increase in administrative remedy rates at the structural change to unit management. The increase in administrative remedy rates is counter to the direction of change which unit management was expected to produce. In retrospect, it is possible that increased staff availability and more inmate-related decisions made by staff caused the number of complaints about those staff and their decisions by inmates to increase. However, the general finding

of "no effect" by unit management on two important indicators such as incident reports and administrative remedy reports is an indicator that unit management, or its implementation at Lompoc may not be living up to its full potential.

Table 1

ARIMA Model and Impact Parameters for the Administrative Remedy Rate Series

Basic Statistics for the Series

Min = 0 Max = 1.41 Mean = .496 Standard Deviation = .284

Original ARIMA Noise Model. ARIMA (0,1,1)

Source	Parameter	df
Model	$\theta_1 = .9364^*$	155
Model	$\theta_0 = .0042$	156
Residuals	Q = 30.8	29

Tests for Intervention

Week Number	Type of Impact	ω_0 Value	t value	δ_1 value	t value
30	First order pulse	.2399	3.29*	1.0040 ^a	701.00*
30	First order step	.1094	.60	.4475	.49
30	Zero order step	.1792	2.18*	-	-
80	First order pulse	-.1888	.68	.2010	.14
80	First order step	.0406	.48	.6891	.97
80	Zero order step	.1163	1.17	-	-

Final Noise and Impact model

Source	Parameter	df
Model	$\theta_1 = .9616^*$	154
Impact (week 30)	$\omega_0 = .1792^*$	154
Residuals	Q = 29.1	28

^a beyond the bounds of system stability.

* significant at $p < .05$

Table 2

ARIMA Model and Impact Parameters for Serious Incident Rate Series

Basic Statistics for the Series

Min = 0 Max = 4.12 Mean = 1.06 Standard Deviation = .579

Original ARIMA Noise Model. ARIMA (0,1,1)

Source	Parameter	df
Model	$\theta_1 = .8890^*$	155
Model	$\theta_0 = .1890$	156
Residuals	Q = 21.0	29

Tests for Intervention

Week Number	Type of Impact	ω_0 Value	t value	δ_1 value	t value
26	First order pulse	.0683	.32	1.0116 ^a	92.56*
26	First order step	.0309	.05	.0420	.00
26	Zero order step	.0304	.12	-	-
30	First order pulse	.0911	.40	-.9476 ^a	-6.00*
30	First order step	.1516	.47	-.9527 ^a	-6.79*
30	Zero order step	.0510	.19	-	-
80	First order pulse	-.0001	-.04	1.1025 ^a	5.50*
80	First order step	-.0870	-.55	.7568	1.66
80	Zero order step	-.1935	-.72	-	-

Note. Final model reflects the noise model because there were no significant impacts.

^a beyond the bounds of system stability.

* significant at $p < .05$

Table 3

ARIMA Model and Impact Parameters for Less Serious Incident Rate Series

Basic Statistics for the Series

Min = .390 Max = 4.05 Mean = 1.82 Standard Deviation = .659

Original ARIMA Noise Model. ARIMA (0,1,1)₄

Source	Parameter	df
Model	$\theta_4 = .6519^*$	152
Model	$\theta_0 = .1890$	153
Residuals	$Q = 45.5^*$	29

Tests for Intervention

Week Number	Type of Impact	ω_0 Value	t value	δ_1 value	t value
26	First order pulse	-.6828	-1.21	.3848	.57
26	First order step	-.3947	-.72	-.2052	-.13
26	Zero order step	-.3254	-1.33	-	-
30	First order pulse	-.3175	-1.25	.9872 ^a	28.29*
30	First order step	-.2077	-.43	.2724	.16
30	Zero order step	-.2663	-1.12	-	-
80	First order pulse	-.2867	-.50	.2929	.17
80	First order step	.0257	1.65	.9821 ^a	59.20
80	Zero order step	.4044	1.80	-	-

Note. Final model reflects the noise model because there were no significant impacts.

^a beyond the bounds of system stability.

* significant at $p < .05$

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